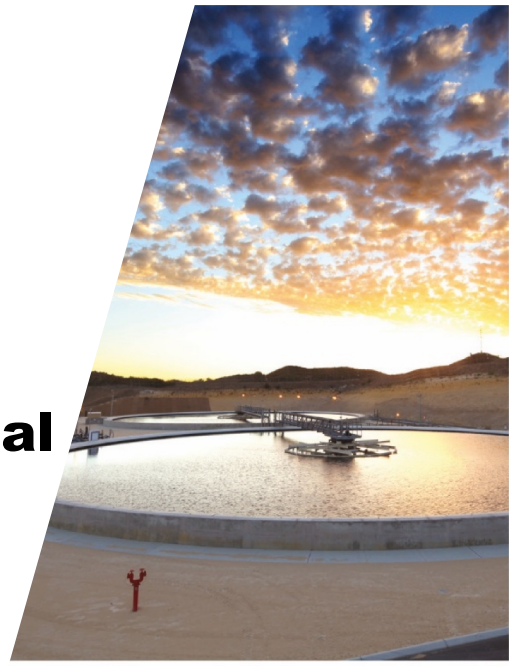
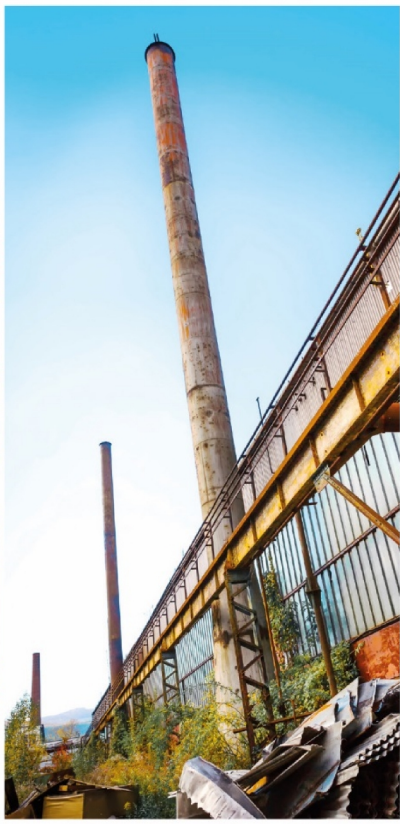


Limited Phase I Environmental Site Assessment and File Review

Commercial Property
5 Western Drive
Barachois Brook, Newfoundland and Labrador

Back Home Medical Cannabis Corporation (Back Home Grow)



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1. Introduction

GHD Limited (GHD) was retained by Back Home Medical Cannabis Corporation (BHMCC) to conduct a Phase I Environmental Site Assessment (ESA) of the property located at 5 Western Drive (Property or Site) in the Town of Barachois Brook, Newfoundland and Labrador (NL). The subject Property is currently owned by BHMCC, which GHD understands is a subsidiary of Biome Grow Inc. (Biome), and the existing Site building is being renovated as a medical cannabis production and processing facility.

The purpose of the Phase I ESA was to identify, through non-intrusive investigation, the existence of any significant, actual or potential areas of environmental impairment associated with the Property. A Site Location Map is included as Figure 1, the Subject Property and Surrounding Land Use is shown as Figure 2, and a Site Plan is included as Figure 3.

The Phase I ESA was conducted in general accordance with the CSA Standard Z768-01 for conducting ESAs. The qualifications of the GHD personnel who completed the Phase I ESA are provided in Appendix A. The Phase I ESA included a review of Site history, a Property inspection, document review, interviews with individuals knowledgeable of the Site operations, and correspondence with regulatory agencies. The following tasks were conducted during this assessment:

- Review of an electronic environmental database search
- Review of available fire insurance plans and aerial photographs
- Review of any available previous environmental reports and company files
- Review of past and current Property usage and adjacent property occupancy
- Inspection of the facilities, equipment, utility services, operations, and associated records for the Property
- Observations of any conditions that represented potential environmental concerns
- Review of chemical usage and storage and spill/release incidents
- Review of underground and aboveground storage tank records
- Review of air emissions and wastewater discharges
- Review of waste handling, storage, and disposal practices
- Review of equipment that potentially contains polychlorinated biphenyls (PCBs)
- Observations of potential asbestos-containing materials (ACMs)
- Observations of potential microbial growth (mould)
- Observations of potential heavy metals
- Observations of potential ozone depleting substances (ODS)
- Observations of potential ionizing radiation sources

- Inquiries with regulatory agencies and discussions with persons knowledgeable of the Site and Site operations

GHD relied on information received from all parties as accurate, unless contradicted by field observations or written documentation.

The following report summarizes the information gathered by GHD during the Phase I ESA and identifies any significant actual or potential environmental impairment issues associated with the related Property.

This Phase I ESA has been prepared for the use of Back Home Medical Cannabis Corporation and Biome Grow Inc. and may not be relied upon by others without the written concurrence of GHD, Biome, and BHMCC.

2. Historical Records

Historical land use of the Property was investigated by GHD through a review of regulatory correspondence, Property title documents, aerial photographs, interviews, and available documents or reports pertaining to the Site.

2.1 Regulatory Correspondence

The Government of Newfoundland and Labrador – Service NL (Service NL) was requested to undertake a search of their records for documentation pertaining to environmental issues at the Site. At the time this report was submitted, no response had been received from Service NL. The results from the Service NL search will be forwarded to BHMCC upon receipt.

The Newfoundland and Labrador Department of Municipal Affairs and Environment (DMAE) Pollution Prevention Division were also requested to undertake a search for available records pertaining to environmental issues at the Site. At the time this report was submitted, no response had been received from DMAE. The results from the DMAE search will be forwarded to BHMCC upon receipt.

Copies of the regulatory search requests and responses are provided in Appendix B.

2.2 Property Title Search Information

A legal survey was provided to GHD by BHMCC. A review of the legal survey indicated the Site is located just to the east of Main Road in Barachois Brook, NL and is located just north of Carter's Road. The Site is shown to be approximately 155 metres in width, 623 metres in length and approximately 80,940 square metres (m^2) in area. The Site is generally rectangular in shape with the south portion irregular shaped to follow the contours of Carter's Road. The Main Road (Route 461) and Carter's Road are shown to have a 20 metre wide right-of-ways. A runway is located just north of the Site. Surrounding properties to the west, north, and east are indicated to be owned by David Callahan.

A copy of the legal survey is provided in Appendix C.

2.3 Heirs Search Information

Historical Environmental Information Report Searches (HEIRS) assist in the identification of historical land use and commonly indicate the existence and location of ASTs, USTs, structures, improvements, and facility operations. GHD obtained the services of Opta Environmental Services (Opta) in Markham, Ontario to search their records for available information regarding the Site.

A Multi Risk –fire, liability, and basic crime survey report was available for review, which pertains to an adjacent property of which encompasses a portion of the Site. The Multi Risk Report was completed on civic address 0 Main Road, Barachois Brook, NL, and was created for Western Construction/ Diamond Equipment in 1997. The report indicated the insured was the owner/operator of the property and had been in operation since 1969. The report stated that Western Construction occupied the Site building (former Repair Shop) as a private repair garage with mechanical repairs carried out on construction equipment. The premises were reportedly in good condition and consisted of a parts department with mezzanine storage area and offices. The building was reportedly constructed in 1978 and was 1,104 m^2 in area and constructed of steel walls, concrete floor (slab-on-grade), and steel roof. Outbuildings were described as boiler room and oil storage with an area of 110 m^2. Heating was described as electric (20 percent) and borrowed steam heat (80 percent). Plumbing was described as copper piping and plastic in good condition. No elevating devices were reported to be in operation.

A copy of the HEIRS search results are provided in Appendix D.

2.4 Aerial Photographs

Aerial photographs from 1949, 1966, 1973, 1983, 1997, 2004, 2010, and 2013 were reviewed during the Phase I ESA. The observations of the aerial photographs review are presented below. Copies of the aerial photographs are included in Appendix E.

The 1951 aerial photograph shows the Site and surrounding properties as mainly undeveloped forested land. A wetland area is visible north of the Site and Main Road (Route 461) and the Newfoundland Railway are visible west of the Site while Carter's Road is visible south of the Site.

The 1966 aerial photograph shows two buildings (carpenter shop and boiler building) visible southwest of the Site; however, the aerial photograph quality is poor. An airstrip was located just north of the Site and some commercial (storage building, bunkhouse, main office, and watchman's building) and residential buildings were visible west of the Site.

The 1973 aerial photograph shows trailers visible north of the Site. Also, the Site building noted in the 1966 aerial photograph is clearly visible. A cleared area with some buildings or trailers were visible southwest of the Site and an additional commercial building (paint shop) is visible west of the Site.

The 1983 aerial photograph shows the Site building (former repair shop) present in the southwest portion of the Site. A trail is visible along the south portion of the Site adjacent to Carter's Road. The northwest portion of the Site was cleared and appears to be utilized as a storage/laydown yard.

The 1997 aerial photograph shows the Site as relatively unchanged compared to the 1983 aerial photograph. A cleared area is visible south of the Site, on the south side of Carter's Road with some commercial buildings present.

The 2004 and 2010 aerial photographs show the Site and surrounding properties as relatively unchanged compared to the 1997 aerial photograph.

The 2013 aerial photograph shows the Site and surrounding properties as relatively unchanged compared to the 2010 aerial photograph except the paint shop is no longer visible just west of the Site.

2.5 Previous Environmental Reports

MGI (now GHD) completed previous ESA work at the larger original site, a portion of which is the subject of this report. Previous environmental reports completed for the larger site are as follows:

- Phase I and "Limited" Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NFLD, MGI report dated March 5, 2001.
- Additional Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NFLD, MGI report dated August 15, 2001.
- Phase III Environmental Site Assessment, Risk Assessment and Remedial Action Plan, Western Construction Company Limited, Barachois Brook, Newfoundland, MGI report dated November 2, 2004.
- Remedial Action Implementation Report, Western Construction Company Limited, Barachois Brook, NL, MGI report dated November 2005.
- Aquifer Test Analysis, Water Well, Western Construction Property, Barachois Brook, NL. Gemtec Consulting Engineers and Scientists Limited, June 2018.
- 2019 Test Pitting Program, Back Home Medical cannabis Corporation, 5 Western Drive, Barachois Brook, NL. GHD Limited letter report dated March 21, 2019.

The assessment activities between 2001 and 2004 that were followed by targeted remediation from the Remedial Action Plan in conjunction with a data review, site inspections and human health risk calculations, each area of concern and the outcomes are summarized below. Remedial work was completed from May 24 to July 18, 2005 by Springhill Construction Limited under the supervision of MGI. Equipment was provided by Whalen Enterprises and by Pardy's Waste Management of Stephenville, NL. It was noted that 521.8 tonnes of soil was removed from the Site and transported to the GDH Environmental Inc. soil treatment facility in Stephenville, NL for disposal. Sample locations relevant to the subject location are shown on Figure 3.

2005 Potential Indoor Air Health Risk at the Repair Shop

Since soil excavation to the depth required would have undermined the Repair Shop and there was a reasonable expectation that indoor air quality was acceptable based on the air exchange rate and size of the building, MGI proposed to conduct indoor air sampling using a Tier III approach upon provincial adoption of the Atlantic PIRI Protocols at the time.

Results of the indoor air test completed at the repair shop confirmed that human health was not at risk based on test results and data interpretation.

2005 Aesthetic Cleanup of Stained Surface Soils

Several locations required surface soil cleanup to comply with the provincially adopted policy of no surface soil hydrocarbon staining in various locations at the north and south External Storage Areas. The hydrocarbon impacted soils at each of these locations was proposed to be excavated to a depth of up to 1.0 metres as required by field observation.

Surface soil was removed from various locations at the two external storage areas, located north and south of the airstrip (9 tandem truck loads).

Visual inspection by MGI staff confirmed the removal of surface stained soils.

2005 Closure of Remedial Action Plan

The Remedial Action Plan approved by NLDEC was completed. There were no outstanding items of the Remedial Action Plan related to contaminant removal. Based on the results of the remedial program completed in 2005, the 2005 report was submitted to NLDEC for regulatory closure.

2018 Potable Water Source Aquifer Test

Gemtec prepared a report on the yield and water quality for the drilled well planned to be used as the potable water source for the Site. The well is located approximately 275 metres southwest of the subject Property south of Carter's Road and east of Main Road (Route 461). The aquifer test was completed by Northeast Well Drilling Company Ltd. over a 24 hour period that confirmed a 100 day safe yield of about 25.5 Litres/minute with chemical and bacterial analysis results were below the Guidelines for Canadian Drinking Water Quality.

2019 Test Pitting Program

A diesel pick-up truck wreck was stored in the former laydown yard from September 2016 to February 2018 while the Maritime Link contractor occupied the Site. An unknown quantity of diesel fuel leaked from the fuel tank over the 18 month period and was estimated at less than 100 Litres (the capacity of the fuel tank). Based on this information, 10 test pits (TP1 to TP10) were excavated in the former laydown yard area with one test pit (TP3) located in the area of observed surface soil staining where the wreck was located. One soil sample (TP3-SS5) and its field duplicate (TP3-SSB) collected at 2.4 to 3.0 mbgs, reported Total Petroleum Hydrocarbon (TPH) exceedances for a commercial property with *potable groundwater* and coarse-grained soil using the Atlantic Risk-Based Corrective Action (RBCA) Tier I Risk-Based Screening Level (RBSL) criterion. The petroleum hydrocarbon impacts were delineated vertically and laterally by other test pits in the area. Based on a potable water exclusion zone applied at the impacted area where the truck wreck was located with a 30 metres radius around the impact area, the localized area of TP3 was revised to a non-potable groundwater condition. As a result, TPH concentrations from the soil sample (TP3-S5) and its field duplicate (TP3-SB) were below the Tier I criterion for a commercial property with *non-potable groundwater*.

In addition, select soil samples were also submitted for Volatile Organic Compounds (VOC), metals, Polycyclic Aromatic Hydrocarbon (PAH), and Polychlorinated Biphenyls (PCBs) analysis. All analytes reported concentrations below the applicable Canadian Council Ministers of the Environment (CCME) Canadian Soil Quality Guidelines (CSQGs) for the site occupancy.

Test pit locations are shown on Figure 3. A report was not available to document this work; however, Back Home Grow provided a copy of the laboratory certificates of analysis that are included in Appendix G.

2.6 Interviews

GHD interviewed Mr. Dave Callahan (President and Site Owner) who provided some information regarding the Site. Mr. Callahan indicated he has been involved with the Site for approximately 15 years. Mr. Callahan indicated a wrecked diesel pick-up truck was parked on the Site in the former laydown yard that leaked diesel fuel oil, which resulted in the completion of 10 test pits. Mr. Callahan also confirmed that a clean-up was conducted on the Property following the assessment activities that were completed in 2004. Mr. Callahan indicated a UST located on the adjacent Property west of the Site is in use as a heating fuel for the on-Site building.

GHD interviewed Matthew Simms, of BHMCC, regarding the Site and surrounding properties. Mr. Simms provided a legal survey, analytical results and GPS coordinates of test pits completed on the Site, an aerial photograph showing the planned location of the new Site building with floor plans, a previous report regarding an aquifer test analysis of a water well on the Western Construction Property, and Site photographs, all of which are provided in Appendix G and H. Mr. Simms indicated the Site is planned for use as a cannabis grow facility and the Site is currently vacant, with the exception of a former repair shop and boiler building on Site. Mr. Simms indicated debris on the Site is from a previous owner whom has left some canning equipment on the Site. Additionally, the Site was also formerly utilized as a laydown yard for the Maritime Link Project, and there is some miscellaneous metal debris currently present. Mr. Simms indicated all debris is planned to be removed from the Site in the spring of 2019.

A representative of the Community of Barachois Brook was contacted to provide information for the Site; however, a response was not received at the time of writing this report.

3. Property Inspection

Based on photos provided by BHMCC on March 20, 2018, GHD prepared this Limited Phase I ESA with a Site inspection to be completed by GHD before the end of March 2019. The Property is located at 5 Western Drive in the Community of Barachois Brook, NL. At the time of the limited inspection, the exterior areas were partially snow covered.

3.1 Property Overview

The Site is located on the north side of Carters Road and just east of Route 461 or Main Road in the Community of Barachois Brook, NL. The overall Property is covered by a Site building (former repair shop; approximately 5 percent), a cleared area (approximately 50 percent) and vacant forested land approximately 45 percent) that covers an area of approximately 80,940 m^2. It is GHDs understanding a proposed Site building is planned to be located approximately in the centre of the Site and is proposed to be 13,935 m^2 in size (refer to Appendix G for further detail). Surface water and groundwater flow in the area is anticipated to follow the surface topography to the southwest, toward Barachois Brook located south of the Site and Georges Bay located west of the Site. A

wetland area is located approximately 20 metres north of the Site and is the nearest ecological receptor. Site photographs provided by BHMCC are provided in Appendix H.

Based on the intended land use, the Site is classified as a commercial property with potable groundwater and coarse-grained soil.

3.2 Environmental Setting

The Site is located on the north side of Carters Road in the Community of Barachois Brook, NL in a mixed commercial/residential area. According to a previous report completed in 2004 by MGI (then CRA, now GHD), the Site is zoned as commercial while surrounding properties include mixed commercial and residential (towards Main Road/Route 461) usage. The Site is bound to the north by a former airstrip, followed by vacant land, to the east by vacant forested land, to the south by Carters Road followed by a borrow pit, and to the west by former Western Construction area followed by some residential properties and Route 461/Main Road (refer to Figure 2). Visual evidence of potential adverse environmental impacts to the Site from adjacent properties was not observed at the time of the limited Site inspection by BHMCC.

A review of the “Surficial Geology of Insular Newfoundland, Preliminary Version”, issued by the Geological Survey Division of the Mines Branch of the Department of Natural Resources, Government of Newfoundland and Labrador (Map 90-08) indicates that the Site geology consists of poorly to well sorted gravel and sand, 1.5 to 80 metres thick, having a diverse surface topography; gravel is pebble to cobble sized, and forms 50 to 95 percent of the sediment; incorporated into this unit are eskers (sinuous elongated ridges 3 to 15 metres high, and up to 10 km long); kames (moderately to steep sided mounds 3 to 30 metres high), kame terraces (terraces along valley sides, 3 to 20 metres thick, and up to 10 km long); outwash plains (plains having low relief, and a channeled surface, 3 to 50 metres thick and up to 20 km long), and deltas (fan-shaped mounds, up to 80 metres thick and 2 km diameter).

A review of the “Geology of the Island of Newfoundland”, issued by the Geological Survey Division of the Mines Branch of the Department of Natural Resources, Government of Newfoundland and Labrador (Map 90-01) indicates that the bedrock in the vicinity of the Site consists of Post Ordovician Overlap Sequences from the Carboniferous (Visean to Westphalian) era, consisting of fluviatile and lacustrine, siliciclastic and minor carbonate rocks; intercalated marine, siliciclastic, carbonate and evaporitic rocks; minor coal beds and mafic volcanic flows.

3.3 Utility Services

Electricity is supplied by Newfoundland Power and the Site and surrounding properties are serviced by municipal water wells and septic systems.

At the time of the photo and file review, evidence of active or water supply wells were identified west of the Site, on site, and southeast of the site and are shown on Figure 2. Abandoned water supply wells and/or septic systems were not observed; however a septic system is present on the Site.

3.4 Underground Storage Tanks (USTs)

At the time of the photo and file review, infrastructure indicating the current presence of USTs was not observed. Past evidence of USTs was revealed from the records review that confirmed three USTs were removed followed by targeted remediation of soils. Other past evidence of USTs was not revealed from the records review, historical searches, interviews, or regulatory responses.

3.5 Aboveground Storage Tanks (ASTs)

At the time of the BHMCC Site inspection, active or abandoned ASTs were not observed. Past evidence of ASTs was confirmed for the Boiler Building immediately adjacent to the west Property boundary.

3.6 Floor Drains, Pits, and Sumps

Floor drains, pits and sumps were not observed during the photo or file review.

3.7 Chemical Use and Storage

During the file review, evidence of chemical use and storage was not observed. It is likely the repair shop had a waste oil tank and/or an oil water separator. Other past use of chemicals was not revealed from the records review, historical searches, interviews, or regulatory responses.

3.8 Solid Waste/Recyclables

At the time of the photo and file review, evidence of on-Site solid waste disposal activities was not observed; however, debris piles were noted in several locations of the site. BHMCC indicated the debris piles will be removed in the spring and were accumulations from cleaning up the laydown yard after the former Maritime Link occupancy had expired.

3.9 Hazardous Waste

At the time of the photo and file review, hazardous wastes were not observed. Past evidence of hazardous waste was not revealed from the records review, historical searches, interviews, or regulatory responses.

3.10 Wastewater

At the time of the photo and file review sourcves of wastewater were not observed. It is likely however, there is a washroom with a toilet and sink in the former repair shop. Other sources of wastewater were not identified.

3.11 Stormwater

Stormwater run-off from the Site is mainly directed by overland flow towards ditching. Sources of potential impacts to storm water quality were not observed during the Site inspection.

3.12 Asbestos-Containing Materials (ACMs)

The Opta environmental search indicated the walls and roof of the former repair shop were constructed of steel and the floor of concrete, and are not expected to contain asbestos.

Other past sources of ACMs were not identified through the record reviews, historical searches, interviews, or regulatory responses.

3.13 Polychlorinated Biphenyls (PCBS)

At the time of the photo and file review, evidence of potential PCBs was not observed. Based on the age of the Site building (prior to 1970), the potential does exist for PCB-containing equipment related to ballasts in fluorescent light fixtures located throughout the Site building. Other potential PCB materials or PCB-containing equipment were not identified during the Site inspection.

3.14 Heavy Metals

In 1976, the lead content in interior paint was limited to 0.5 percent by weight under the federal Hazardous Products Act. All consumer paints produced and imported into Canada are virtually lead-free as of 1991. Based on the date of construction of the building (prior to 1970), the potential for lead and/or mercury-based paint being present is possible.

3.15 Ozone-Depleting Substances (ODS)

There are currently no sources of ODS at the Site. Past sources of ODS were not identified through the record reviews, historical searches, interviews, or regulatory responses.

3.16 Air Emissions

At the time of the Site inspection, sources of adverse air emissions were not observed. Past sources of air emissions were not identified through the record reviews, historical searches, interviews, or regulatory responses.

3.17 Ionizing Radiation

At the time of the Site inspection, sources of ionizing radiation were not observed. Based on the geology of the area, sources of ionizing radiation may be present at the Site.

3.18 Chemical Spills / Releases

At the time of the Site inspection, evidence of chemical spills/releases was not identified. Past chemical spills or releases were not identified through the record reviews, historical searches, interviews, or regulatory responses except for the diesel fuel leak from a wrecked pick-up truck in the former laydown area. Although one soil sample and its field duplicate from one test pit location at the location of the former wrecked pick-up reported TPH concentrations above the Tier I criterion for a commercial / industrial property with *potable groundwater*, the nearest drilled and potable well is located about 90 metres west of the subject Property boundary and 275 metres west from the impact area. Assuming a potable well exclusion zone of 30 metres around the impact area at TP3,

the TPH concentrations are below the Tier I criterion for a commercial / industrial property with *non-potable groundwater*.

Historical petroleum hydrocarbon impacts and surface soil staining identified between 2001 and 2004 were remediated in 2005 that resulted in submission for regulatory closure.

3.19 Other Potential Issues of Environmental Concern

No other issues of Potential Environmental Concern were identified on the Site during the photo and file review.

4. Conclusions

Based on the results of the Phase I ESA, including the Site inspection, documents reviewed, actual or potential areas of environmental impairment were identified to exist at the Site as follows:

Aboveground Storage Tanks: One fuel tank was reportedly located outside the Boiler Building since 2004, which poses a potential environmental impairment issue associated with overfilling and/or leaks. An inspection of the area is required to determine if any surface staining is present and collection of a surface soil sample is recommended to assess any potential for historical impacts.

Solid Waste: Various piles of miscellaneous debris were noted in the western area of the Site, which were reportedly a result of clean-up operations following the expiry of the property use for the Maritime Link. Solid waste items included tires, wood dunnage, and scrap metal, all of which will be removed in the spring of 2019 when weather allows.

Polychlorinated Biphenyls: PCBs are potentially present in any fluorescent light fixture ballasts that remain in the Warehouse (former Repair Shop). Fluorescent lights should be inspected to determine if they have been replaced or if original lights still remain that may contain PCB ballasts.

Chemical Spills Releases: Historical spills/releases associated with the property while it was operating as Western Construction were addressed during the 2005 remediation program. A subsequent diesel fuel leak from a truck parked in the former laydown yard resulted in petroleum hydrocarbon impacted soil, which was confirmed by the test pitting program completed in March 2019. Assuming a potable well exclusion zone of 30 metres around the impact area at TP3, the TPH concentrations are below the Tier I criterion for a commercial / industrial property with *non-potable groundwater*. Based on the information provided by BHMCC, other potential sources of leaks or spills were not known.

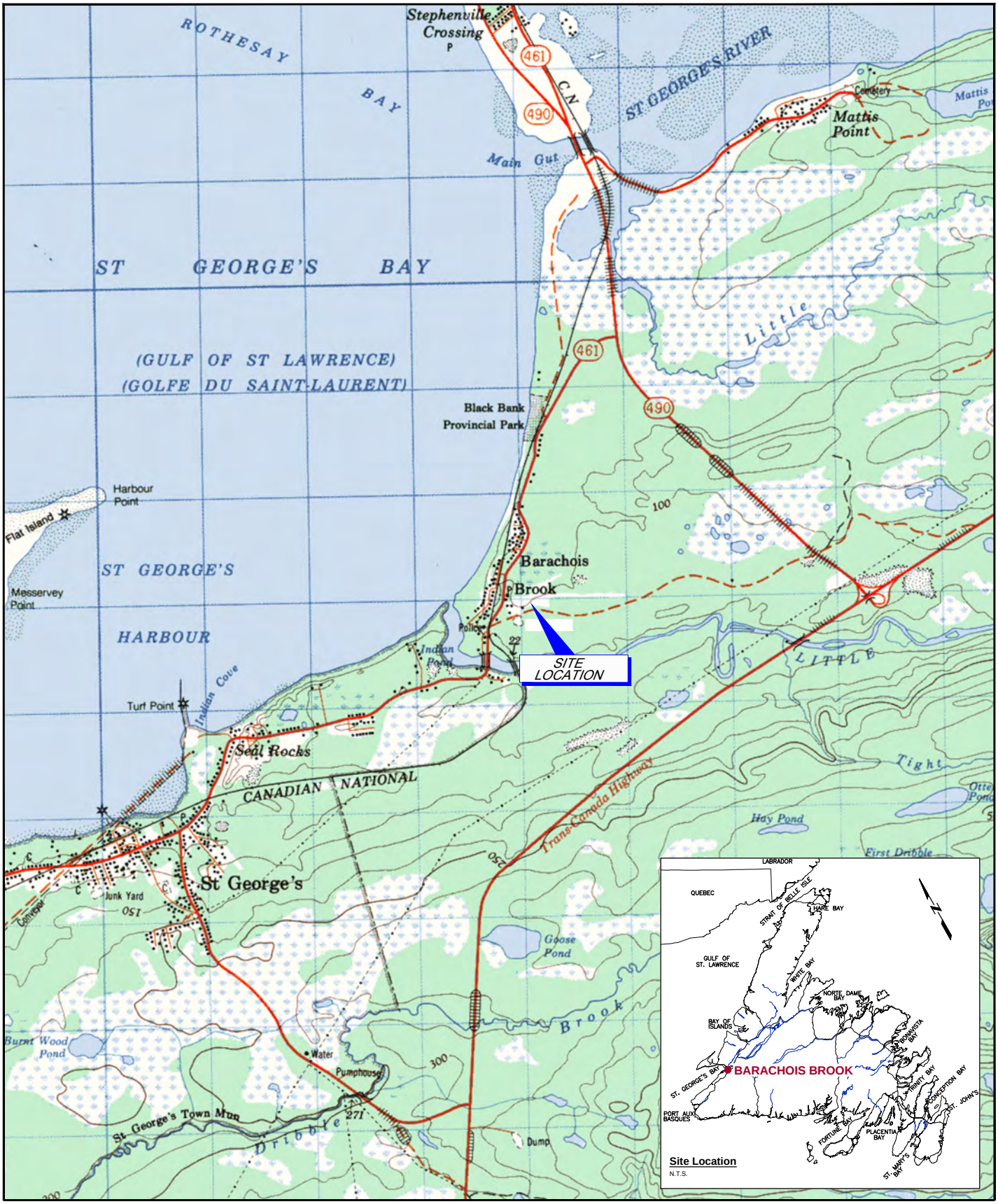
5. Closure

All of Which is Respectively Submitted,

GHD

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

Jennifer Gabriel, B.Sc.
Intermediate Project Manager



0 500 1000 1500m

SCALE: 1:50,000

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

SITE LOCATION MAP

11192875

Mar 20, 2019

FIGURE 1

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SOURCE: MICROSOFT PRODUCT SCREEN SHOT(S) REPRINTED WITH PERMISSION FROM MICROSOFT CORPORATION, ACQUISITION DATE [2013], ACCESSED: 2019

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SCALE: 1:2,500

LEGEND:

SUBJECT PROPERTY BOUNDARY

PROPERTY BOUNDARY

BACK HOME GROW
5 WESTERN DRIVE, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

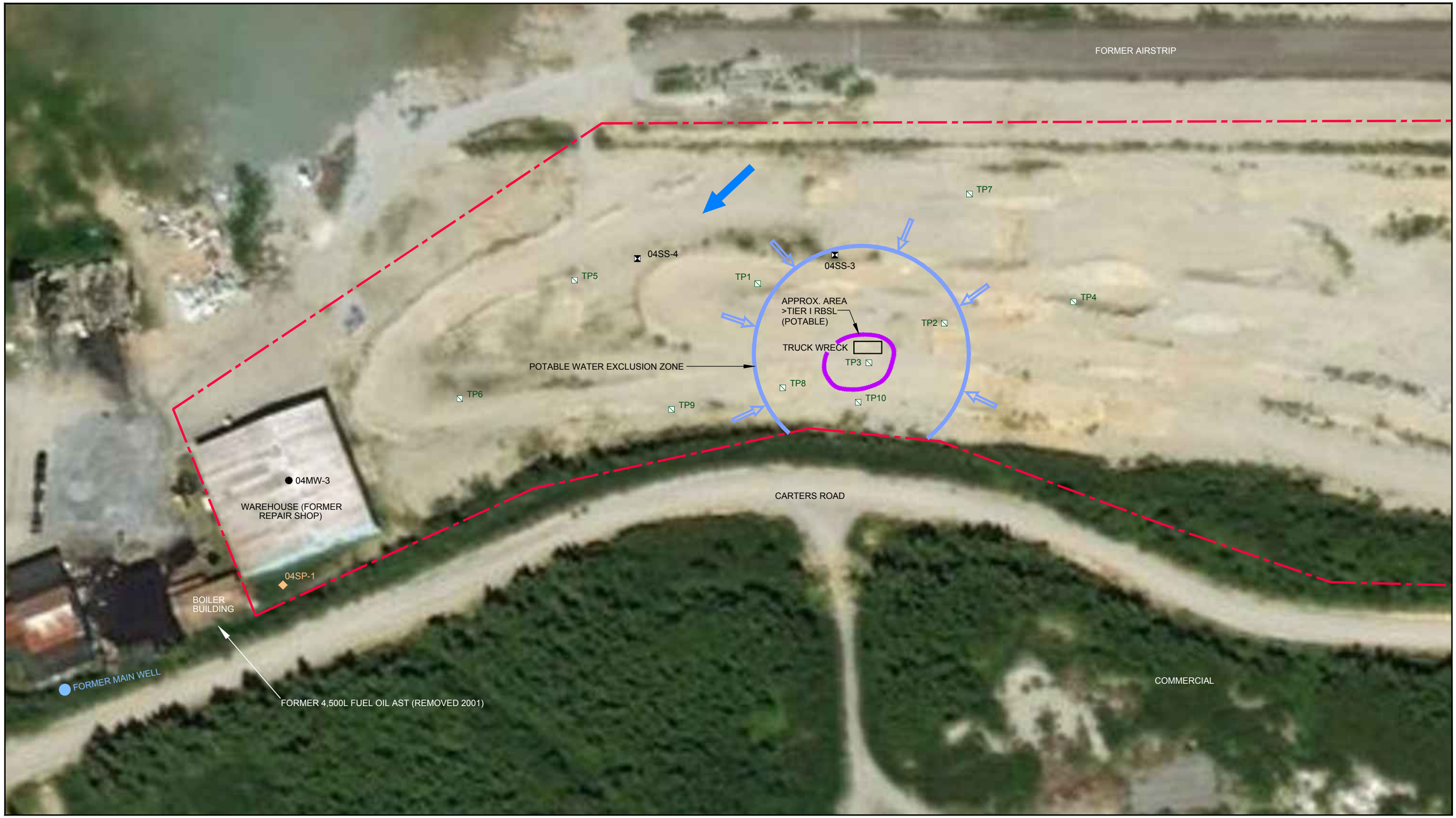
11192875

Mar 20, 2019

SITE PLAN AND SURROUNDING AREAS

FIGURE 2

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NL002.dwg



SOURCE: MICROSOFT PRODUCT SCREEN SHOT(S) REPRINTED WITH PERMISSION FROM MICROSOFT CORPORATION, ACQUISITION DATE [2013], ACCESSED: 2019

0 10 20 30m

SCALE: 1:1,000

N

LEGEND:

- PROPERTY BOUNDARY (ASSUMED)
- BOREHOLE LOCATION (2004)
- MONITOR WELL LOCATION (2004)
- SURFACE SOIL SAMPLE LOCATION
- TEST PIT LOCATION BY OTHERS (2019)
- GROUNDWATER FLOW DIRECTION

GHD

BACK HOME GROW
5 WESTERN DRIVE, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

11192875

Mar 21, 2019

SITE PLAN WITH SAMPLE LOCATIONS

FIGURE 3

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Appendices

Appendix A
Qualifications of Assessors

QUALIFICATIONS OF SITE ASSESSOR

Name: Brian Luffman, P. Eng.

Position: Engineer

Education: B.Eng. (Civil Engineering), Memorial University (1993)

Experience:

Brian Luffman, P. Eng., is an Associate and engineer with GHD Limited. Mr. Luffman is a senior project manager with over 15 years of experience in various aspects of the environmental and construction sectors that included review of environmental site assessments, investigations and remediation of hydrocarbon impacts, hazardous building materials surveys, asbestos management and abatement, drinking water quality, oil storage tank management, indoor air quality investigations (including radon), and noise surveys. Mr. Luffman has completed courses in environmental engineering, hydrology, geology, project management, asbestos abatement, indoor air quality, Standard First Aid/CPR Level C, Automated External Defibrillator, WHMIS, 40-hour HAZWOPER, Powerline Hazards, Leadership in Safety Excellence, and other miscellaneous training. In addition, Mr. Luffman has investigated and designed more than 150 Radon Mitigation Systems in Nova Scotia and Ontario for single family homes, seniors' complexes, apartment buildings, and commercial occupancies. Mr. Luffman is also a member of the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL) and Engineers Nova Scotia (Engineers NS) as a Professional Engineer. Mr. Luffman has been directly involved in numerous environmental site assessment and remediation projects concerning hydrocarbon and PCB impacts on residential and/or commercial sites, and is knowledgeable of the current environmental legislation regarding contaminants and hazardous materials.

QUALIFICATIONS OF SITE ASSESSOR

Name: Jennifer Gabriel, B.Sc.

Position: Environmental Scientist

Education: B.Sc. (Environmental Science), Memorial University (2006)

Experience:

Jennifer Gabriel, B.Sc., is an Environmental Scientist with GHD Limited (GHD). Ms. Gabriel is an intermediate project coordinator with over 10 years of experience in various aspects of the environmental sector that include; review of environmental site assessments, investigations and remediation of hydrocarbon impacts, hazardous building materials surveys, drinking water quality, oil storage tank management, and indoor air quality investigations. Ms. Gabriel has completed courses in contaminated and hazardous waste site management, project management, asbestos abatement, Standard First Aid/CPR Level C, Automated External Defibrillator, WHMIS, 40-hour HAZWOPER, Powerline Hazards, Leadership in Safety Excellence, and other miscellaneous training. Ms. Gabriel has completed various environmental site assessments, monitoring programs and site remediation projects where her duties included project coordination, site supervision, health and safety, soil sampling of excavation boundaries, and groundwater sampling and monitoring. Ms. Gabriel has been directly involved in numerous environmental site assessment and remediation projects concerning hydrocarbon impacts on residential and/or commercial sites. This Phase I was conducted under the direct supervision of senior staff at GHD.

Appendix B
Regulatory Correspondence

Jennifer Gabriel

From: Jennifer Gabriel
Sent: Wednesday, March 20, 2019 8:55 AM
To: 'debbie.goosney@gov.nl.ca'
Subject: Environmental search request - 5 Western Drive, Barachois Brook
Attachments: New Survey_5westerndrive.pdf; Signed permission letter.pdf; bb f1.pdf

Hello Debbie,

GHD Limited has been retained to conduct a Phase I ESA at the following Property owned by Back Home Grown in Barachois Brook, Newfoundland and Labrador (NL):

5 Western Drive, Corner Brook, NL.

Please review your records for the above listed property and provide us with any available information, such as:

- AST or UST registration, or records of tank decommissioning;
- Knowledge or records of past environmental impacts or infractions; and/or
- Any known existing environmental concerns.

I have attached a copy of all supporting documentation (i.e.,Site Location Map, Legal Survey, permission letter).

We have also sent a separate request to DMAE.

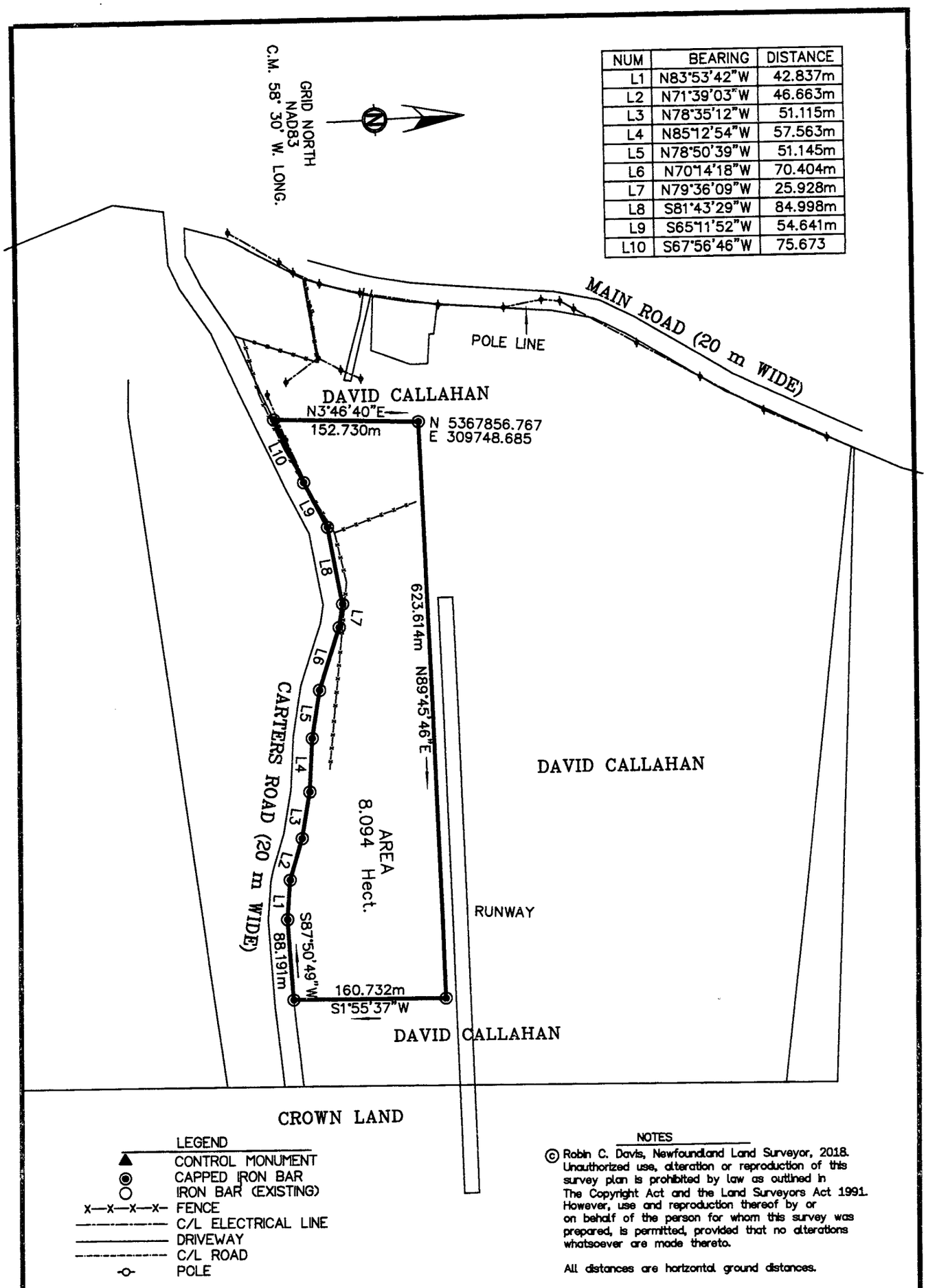
Thank you for your time, please contact me if you have any questions,

---

Jennifer Gabriel, B.Sc

GHD
Proudly employee owned
T: 709 364 5353 | M: 709 693 9655 |E: jennifer.gabriel@ghd.com
1118 Topsail Road PO Box 8353 Station A St. John's NL A1B 3N7 Canada | www.ghd.com

Connect



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L4	N85°12'54"W	57.563m
L5	N78°50'39"W	51.145m
L6	N70°14'18"W	70.404m
L7	N79°36'09"W	25.928m
L8	S81°43'29"W	84.998m
L9	S65°11'52"W	54.641m
L10	S67°56'46"W	75.673

LEGEND

- CONTROL MONUMENT
- CAPPED IRON BAR
- IRON BAR (EXISTING)
- x—x—x—x— FENCE
- C/L ELECTRICAL LINE
- DRIVEWAY
- C/L ROAD
- POLE

NOTES

All distances are horizontal ground distances.

ROBIN DAVIS NEWFOUNDLAND LAND SURVEYOR PROVINCE OF NEWFOUNDLAND

R. DAVIS SURVEYS LTD.
P.O. BOX 449
STEPHENVILLE CROSSING, NEWFOUNDLAND AND LABRADOR

LAND SURVEYED FOR
DAVID CALLAHAN
CARTERS ROAD, BARACHOIS BROOK, NL

SCALE: 1 : 5000	DWG. NO.: 17207–4
DATE: APR. 5, 2018	DRAWN BY: R.D.

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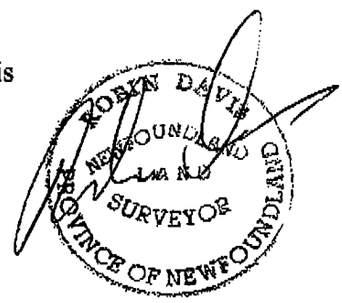
The herein described parcel of land contains an area of 4.566 hectares and is more particularly delineated on the plan number 17207-1 hereto attached,

All bearings refer to the meridian of fifty-eight degrees thirty minutes west longitude of the Modified Three Degree Transverse Mercator Projection (NAD83).

Robin C. Davis



Newfoundland Land Surveyor

November 23, 2017
Stephenville, NL

March 19, 2019

Re: **Phase I Environmental Site Assessment**
Commercial Property
5 Western Drive
Barachois Brook, NL

To Whom It May Concern:

As owner of the Back Home Grow commercial property located at 5 Western Drive in Barachois Brook, NL, I certify that GHD was retained to complete a Phase I Environmental Site Assessment on the above-noted property.

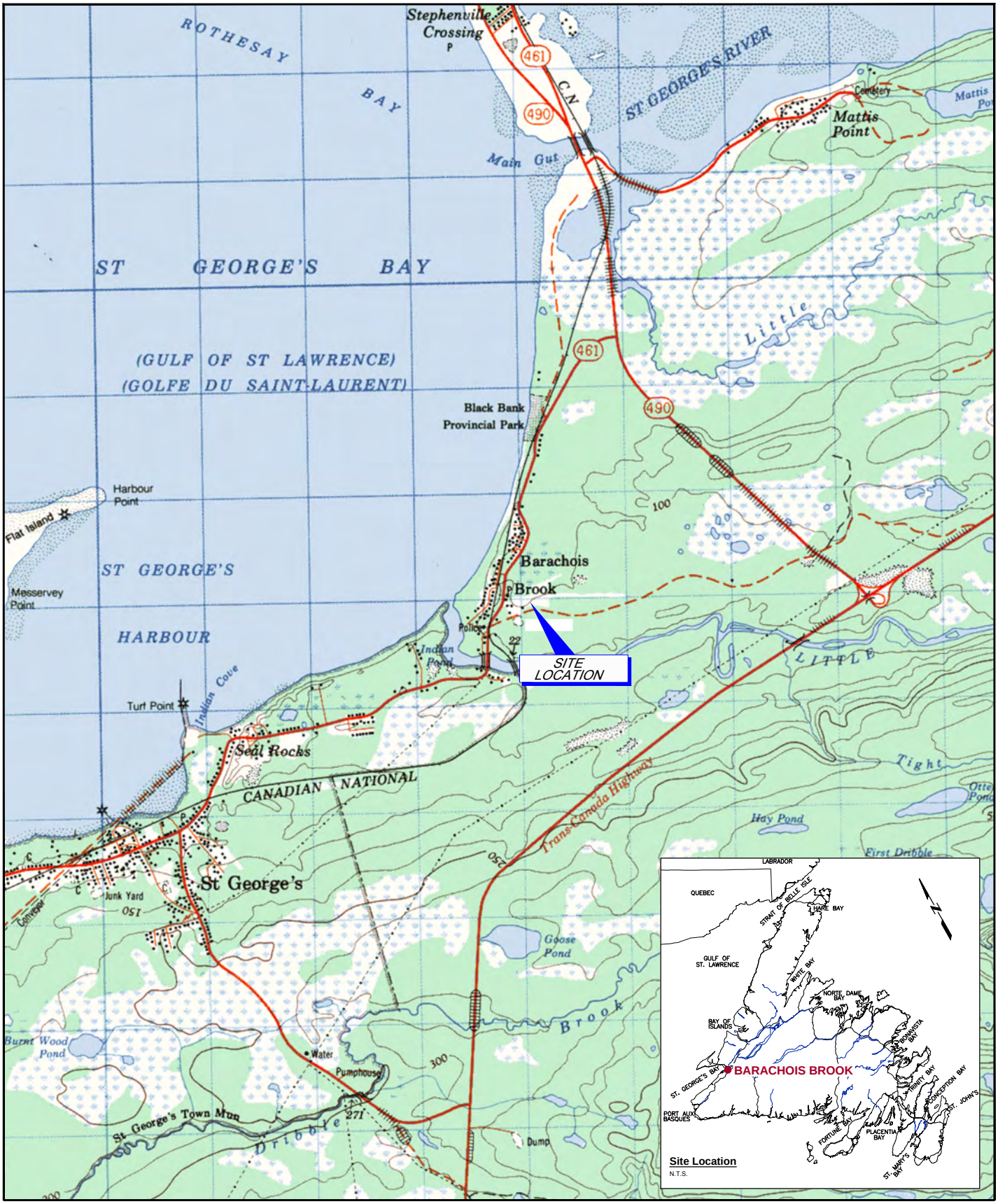
Please release any information pertaining to this property to GHD.

Sincerely,

(Signature)

Dave Callahan
President
Back Home Grow

cc. Brian Luffman, GHD



0 500 1000 1500m

SCALE: 1:50,000

XXX

CARTERS ROAD, BARACHOIS BROOK, NL

PHASE I ENVIRONMENTAL SITE ASSESSMENT

PROJ NO

Mar 19, 2019

SITE LOCATION MAP

FIGURE 1

CAD File: C:\Users\ctpeddle\Desktop\Documents\PDF\barachois\BB F1.dwg

Jennifer Gabriel

From: Jennifer Gabriel
Sent: Wednesday, March 20, 2019 8:55 AM
To: 'envsearch@gov.nl.ca'
Subject: Environmental Search Request - 5 Western Drive, Barachois Brook, NL
Attachments: New Survey_5westerndrive.pdf; Application Form.pdf; bb f1.pdf

Hello,

GHD Limited has been retained to conduct a Phase I ESA at the following Property owned by Back Home Grow in Barachois Brook, Newfoundland and Labrador (NL):

5 Western Drive, Barachois Brook, NL.

Please review your records for the above listed property and provide us with any available information, such as:

- AST or UST registration, or records of tank decommissioning;
- Knowledge or records of past environmental impacts or infractions; and/or
- Any known existing environmental concerns.

I have attached a copy of the application form along with all supporting documentation (i.e., site map, permission letter). Note that I called the cashiers office to pay the search fee yesterday but have not yet received the receipt. I wanted to get this search to you ASAP and I will forward the receipt along as soon as I receive.

We have also sent a separate request to Service NL.

Thank you for your time, please contact me if you have any questions,

---

Jennifer Gabriel, B.Sc

GHD
Proudly employee owned
T: 709 364 5353 | M: 709 693 9655 |E: jennifer.gabriel@ghd.com
1118 Topsail Road PO Box 8353 Station A St. John's NL A1B 3N7 Canada | www.ghd.com

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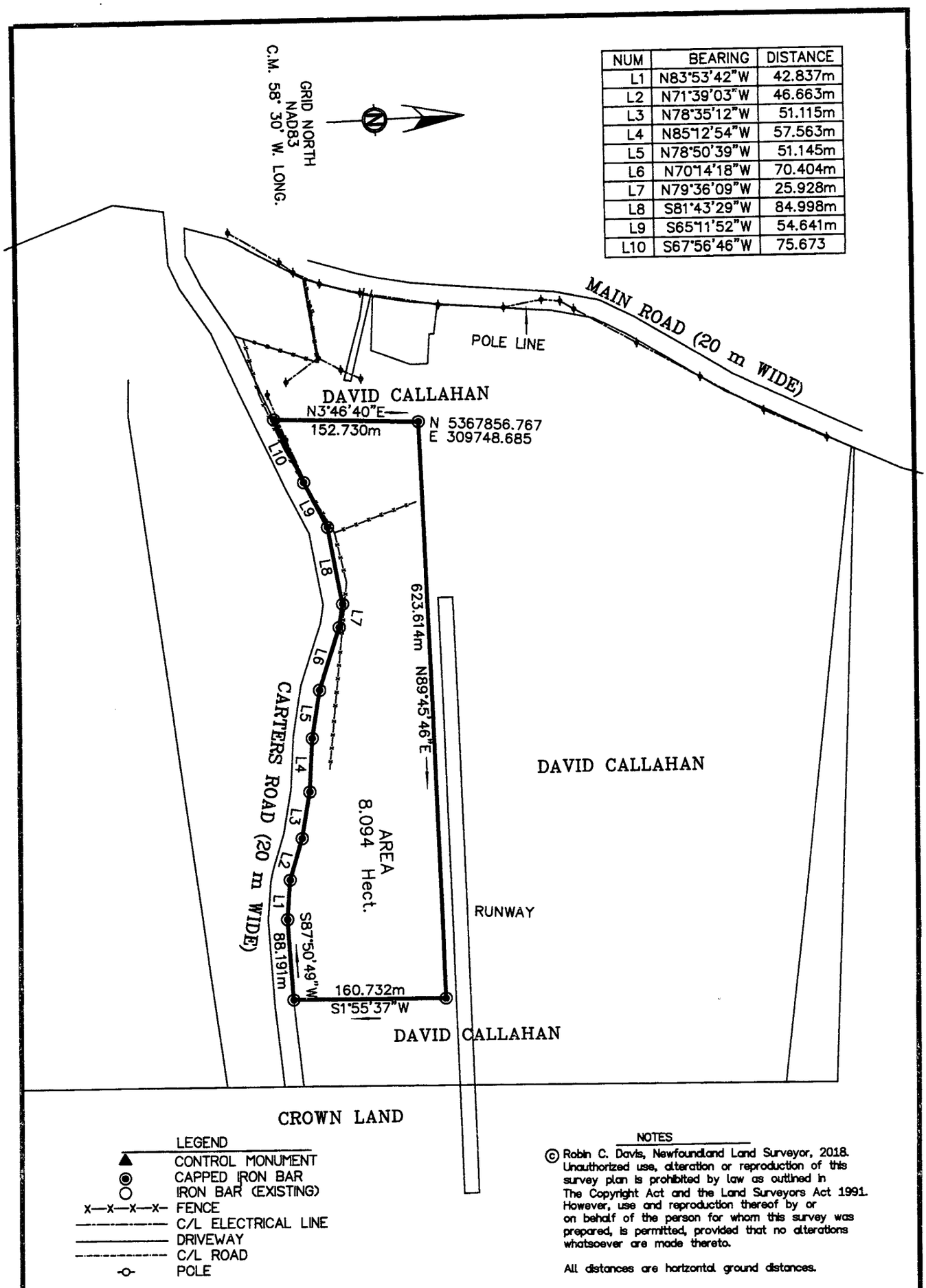

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- C/L ROAD
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STEPHENVILLE CROSSING, NEWFOUNDLAND AND LABRADOR

LAND SURVEYED FOR
DAVID CALLAHAN
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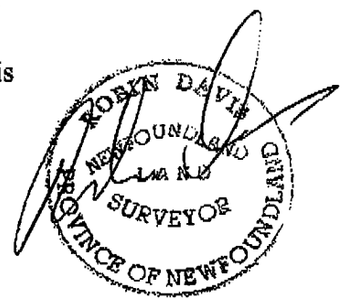


Newfoundland Land Surveyor

November 23, 2017
Stephenville, NL

Newfoundland Labrador

Application for Property Environmental Search

Department of Municipal Affairs and Environment

Property Information

Civic Number	Street Name
5	Western Drive

If no street address available, please provide a detailed description of property location:

See Attached Legal Survey Showing Site Boundaries.

Community: Barachois Brook

Figure or map clearly showing property boundary must be attached (colour figure or map preferred) — Attached ☑

Legal Survey

Past Site Operation(s)/Business(es)/Owner(s) and tank information (if applicable and where known)

Former Western Construction Company Ltd. Per report listed below.

Is the requestor aware of any past environmental work at the site? Yes ☑ No ☐

If yes, please provide details:

CRA/MGI completed Phase III ESA & Risk Assessment in 2004 which included a portion of the Site.

Is the property owned by the Government of Newfoundland and Labrdor? Yes ☐ No ☑

If yes, please provide details:

Requestor Information

First Name	Last Name
Jennifer ~~Gabriel~~	Gabriel
Company Name (if applicable)	**Telephone Number**
GHD Limited	709-693-9655
Email Address	
jennifer.gabriel@ghd.com	

Is the requestor the property owner? Yes ☐ No ☑

If no, does the requestor have the property owner's consent to make the request?

Yes [1] ☑ (proof of consent must be attached) No [2] ☐

Newfoundland Labrador

Application for Property Environmental Search

Department of Municipal Affairs and Environment

Payment Information

Please select the land use of the property:							
Agricultural	☐	Residential/Parkland	☐	Commercial	☑	Industrial	☐

Has the property environmental search fee been paid direct to the NL Exchequer?	Yes	☑	(copy of receipt from Central Cashier's office must be attached)
	No	☐	(copy of cheque mailed to Department must be attached)

1 Proof of consent must be a letter with the printed name and signature of the property owner granting permission to the Department to conduct a file search and release information to you.

2 If consent from the property owner is not obtained, responsive records will require review and redaction in accordance with Access to Information and Protection of Privacy legislation. This may affect the timeline outlined in the service standard.

Property Environmental Search Fee Structure

Property Land Use	Residential	Commercial	Industrial
Fee	$50.00 + HST	$75.00 + HST	$100.00 + HST

Notes:

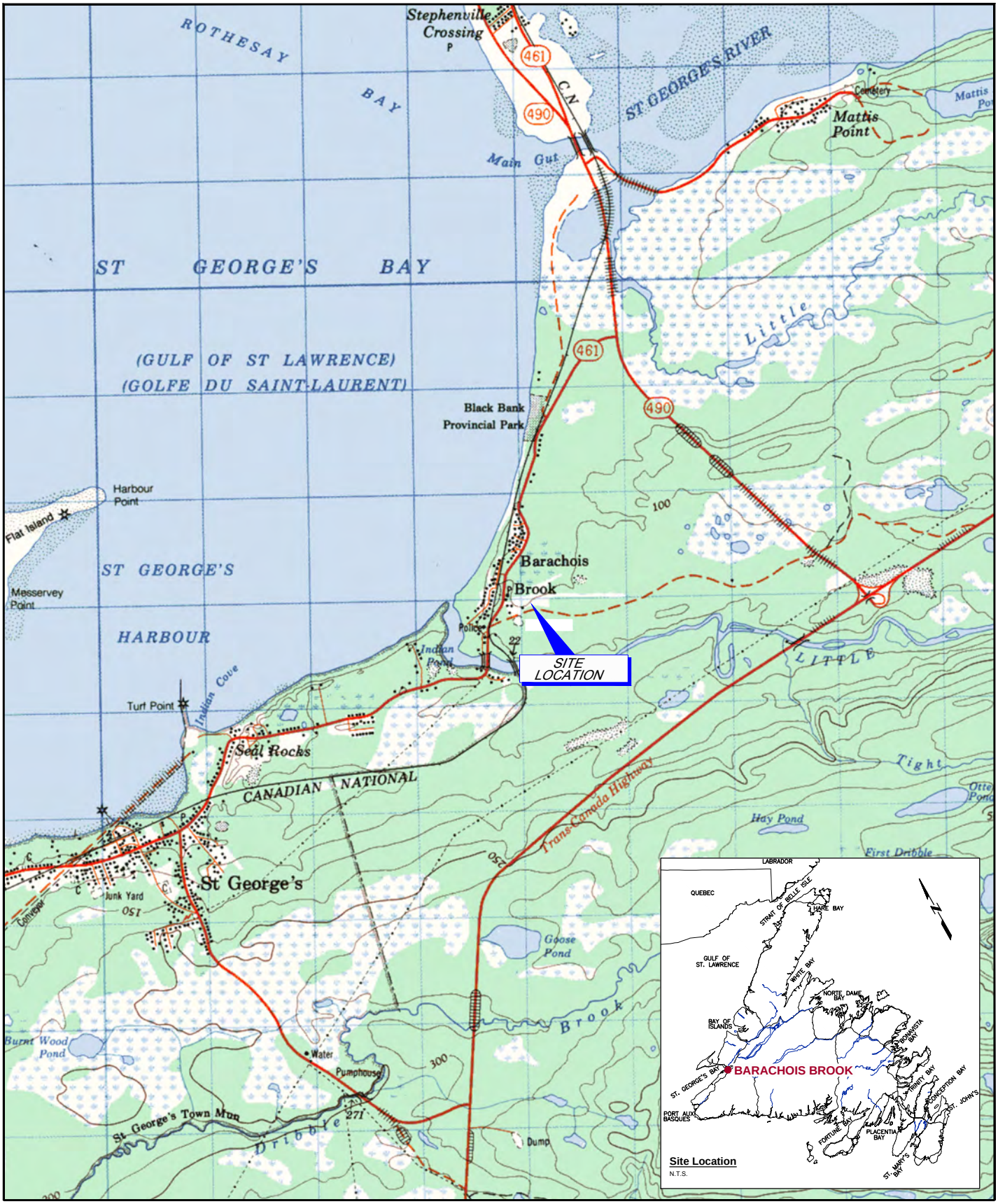
1. Definitions of each land use as per Atlantic Risk-Based Corrective Action (RBCA) User Guidance (Version 3), July 2012 (revised Jan 2015).
2. Agricultural land use, when encountered, is to follow commercial fee structure.
3. Undeveloped land is to follow residential fee structure.
4. Only one property per request.
5. Fee is non-refundable, and is charged whether or not information is found during the search.

Payment can be made to the Department (by cheque) or through the Central Cashier's Office by calling (709) 729-3042. Please quote account name **MPA-Impacted Sites.**

The Central Cashier's Office accepts payment in person by cash, debit, Mastercard, or VISA. Payment can also be made to the Central Cashier's Office by telephone (up to $150), or by mail (money order or cheque). Please make cheque payable to **NL Exchequer.** Please contact the Central Cashier's Office for more information.

For payment to the Department, please mail cheque to:

Attn: Ann Marie Whelan
Property Environmental Search
Pollution Prevention Division
Department of Municipal Affairs and Environment
4th Floor West Block, Confederation Building
St. John's, NL A1B 4J6



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SCALE: 1:50,000

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CARTERS ROAD, BARACHOIS BROOK, NL

PHASE I ENVIRONMENTAL SITE ASSESSMENT

PROJ NO

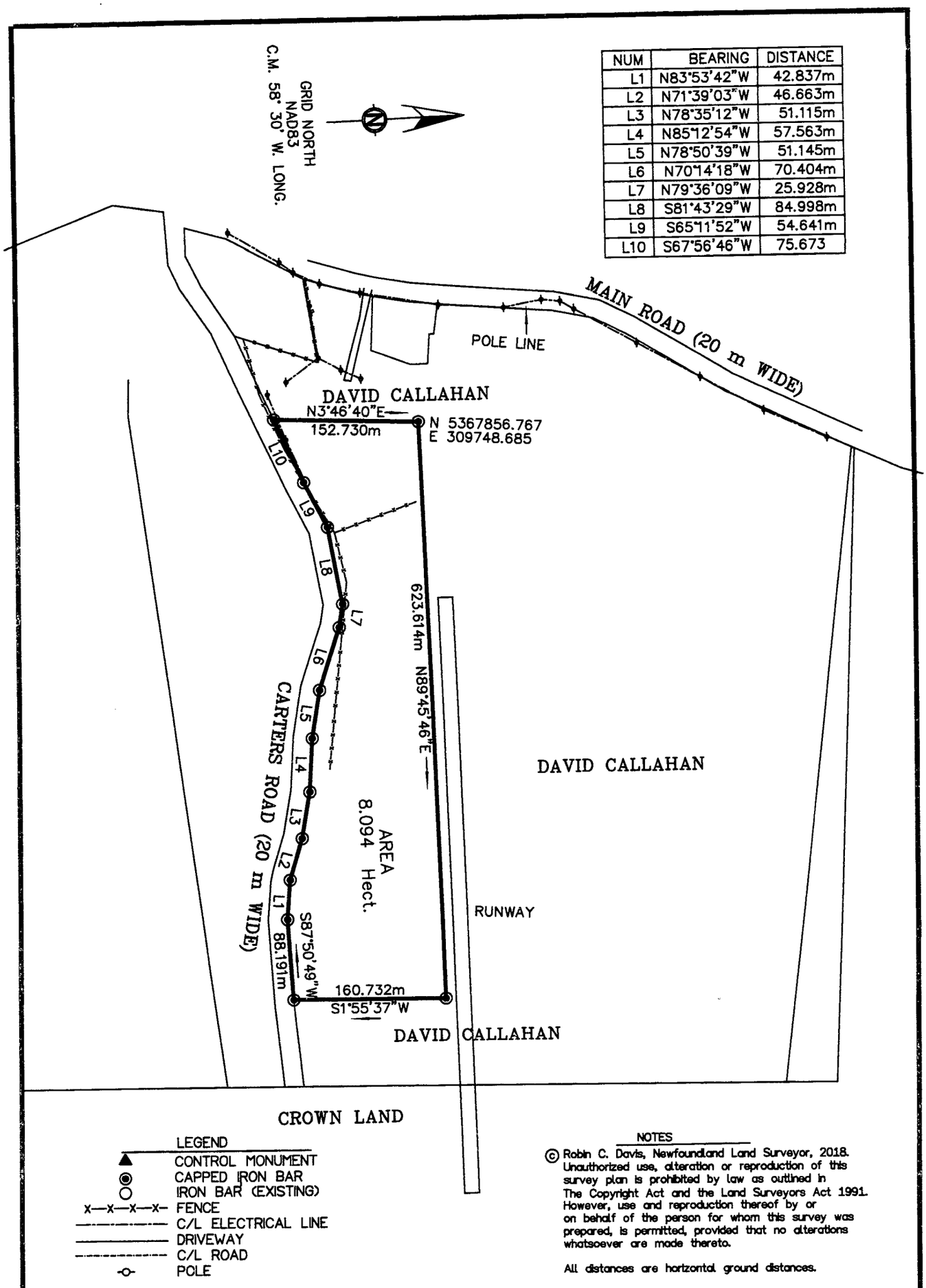
Mar 19, 2019

SITE LOCATION MAP

FIGURE 1

CAD File: C:\Users\ctpeddle\Desktop\Documents\PDF\barachois\BB F1.dwg

Appendix C
Property Title Search



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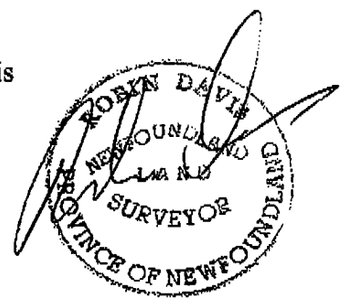


Newfoundland Land Surveyor

November 23, 2017
Stephenville, NL

Appendix D
Heirs Search Information

opta
INFORMATION INTELLIGENCE

enviroscan

An SCM Company

175 Commerce Valley Drive W
Markham, Ontario L3T 7Z3

T: 905-882-6300
W: www.optaintel.ca

Report Completed By:

Sunita

Site Address:

Barachois Brook NL Canada

Project No:

11073501

Opta Order ID:

59290

Requested by:

Jennifer Gabriel
GHD Limited

Date Completed:

3/20/2019 8:00:18 AM

Project Name: Phase I ESA

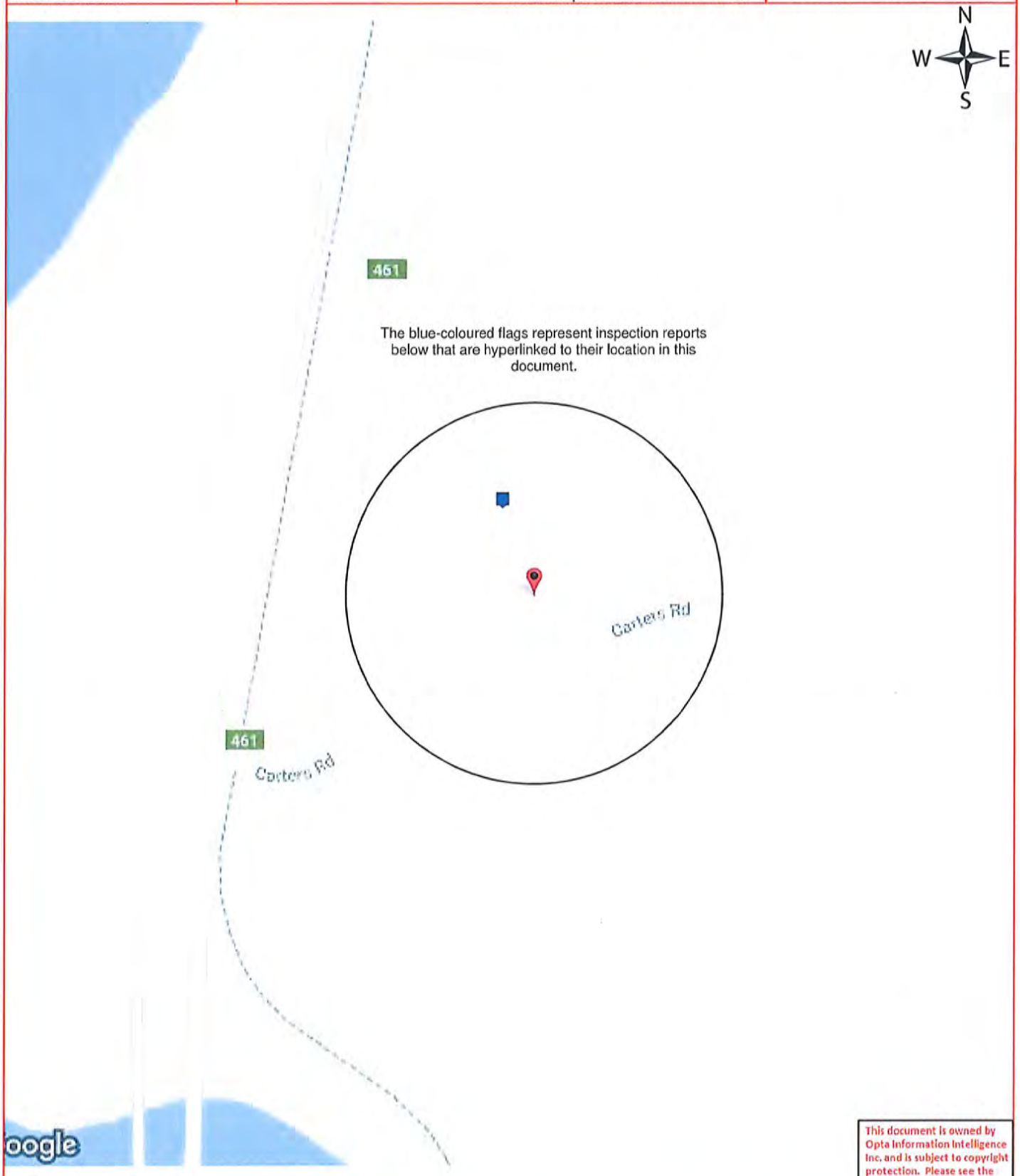
Project #: 11073501
P.O. #: 11073501

ENVIROSCAN Report

Search Area: Barachois Brook NL Canada

Requested by:
Jennifer Gabriel
Date Completed: 03/20/2019 08:00:18

enviroscan
OPTA INFORMATION INTELLIGENCE



Opta Historical Environmental Services Enviroscan™ Terms and Conditions

Report

The documents (hereinafter referred to as the "Documents") to be released as part of the report (hereinafter referred to as the "Report") to be delivered to the purchaser as set out above are documents in Opta's records relating to the described property (hereinafter referred to as the "Property"). Opta makes no representations or warranties respecting the Documents whatsoever, including, without limitation, with respect to the completeness, accuracy or usefulness of the Documents, and does not represent or warrant that these are the only plans and reports prepared in association with the Property or in Opta's possession at the time of Report delivery to the purchaser. The Documents are current as of the date(s) indicated on them. Interpretation of the Documents, if any, is by inference based upon the information which is apparent and obvious on the face of the Documents only. Opta does not represent, warrant or guarantee that interpretations other than those referred to do not exist from other sources. The Report will be prepared for use by the purchaser of the services as shown above hereof only.

Disclaimer

Opta disclaims responsibility for any losses or damages of any kind whatsoever, whether consequential or other, however caused, incurred or suffered, arising directly or indirectly as a result of the services (which services include, but are not limited to, the preparation of the Report provided hereunder), including but not limited to, any losses or damages arising directly or indirectly from any breach of contract, fundamental or otherwise, from reliance on Opta Reports or from any tortious acts or omissions of Opta's agents, employees or representatives.

Entire Agreement

The parties hereto acknowledge and agree to be bound by the terms and conditions hereof. The request form constitutes the entire agreement between the parties pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, negotiations and discussions, whether oral or written, and there are no representations or warranties, or other agreements between the parties in connection with the subject matter hereof except as specifically set forth herein. No supplement, modification, waiver, or termination of the request shall be binding, unless confirmed in writing by the parties hereto.

Governing Document

In the event of any conflicts or inconsistencies between the provisions hereof and the Reports, the rights and obligations of the parties shall be deemed to be governed by the request form, which shall be the paramount document.

Law

This agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

ENVIROSCAN Report

Report Index

Requested by:
Jennifer Gabriel
Date Completed: 03/20/2019 08:00:18

enviroscan
OPTA INFORMATION INTELLIGENCE

Page	Report Title
5	(1997) Multirisk Report - 1997 WESTERN CONSTRUCTION/DIAMOND EQUIPMENT MAIN RD BARACHOIS BROOK NF A0N 1B0 Reference No: 70832343 (distance = 161 metres*)

ENVIROSCAN Report

Multirisk Report - 1997 WESTERN CONSTRUCTION/DIAMOND EQUIPMENT MAIN RD BARACHOIS BROOK NF A0N 1B0 Reference No: 70832343

Requested by: Jennifer Gabriel
Date Completed: 03/20/2019 08:00:18

AIS Ref No.: 70832343

Atlantic Branch
Confidential Report

MULTIRISK SURVEY

Insured:	WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
Location Surveyed:	0 MAIN RD BARACHOIS BROOK, NEWFOUNDLAND A0N 1B0
Person Contacted:	Mr. Jennings
Telephone Number:	(709) 646-2667
Policy Number:	80503756
AIS Reference:	70832343
Surveyed by:	Mr. Richard W. Blundon
Date of Survey:	1997.12.11

Committed to Service Excellence

ENVIROSCAN Report

Multirisk Report - 1997 WESTERN CONSTRUCTION/DIAMOND EQUIPMENT MAIN RD BARACHOIS BROOK NF A0N 1B0 Reference No: 70832343

Requested by: Jennifer Gabriel

Date Completed: 03/20/2019 08:00:18

enviroscan
OPTA INFORMATION INTELLIGENCE

AIS Ref No.: 70832343

1997

NOTE: The sole purpose of this report is to provide insurance pricing and underwriting information about the particular insured and location named. Only the person requesting this survey will receive a copy of the report, and IAO asks that it be kept strictly confidential. This report does not guarantee compliance with any standards or with any federal, provincial or municipal codes, ordinances or regulations. Tests of fire and other protection equipment have not been conducted or witnessed during this survey.

IAO reports, prepared in compliance with commonly accepted risk control standards existing at the time services are rendered, are developed from a survey of the premises and/or from data supplied by or on behalf of the Purchaser. IAO does not purport to list all hazards. While changes and modifications, referred to in the reports are designed to upgrade protection and loss prevention of the premises, IAO assumes no responsibility for management and control of these activities. IAO will not be responsible to the Purchaser for any loss or damages, whether consequential or other, however caused, incurred or suffered, as a result of the services being provided.

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ENVIROSCAN Report

Multirisk Report - 1997 WESTERN CONSTRUCTION/DIAMOND EQUIPMENT MAIN RD BARACHOIS BROOK NF A0N 1B0 Reference No. 70832343

Requested by: Jennifer Gabriel

Date Completed: 03/20/2019 08:00:18

enviroscan
OPTA INFORMATION INTELLIGENCE

AIS Ref No.: 70832343

Page: 1

WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
0 RD MAIN; BARACHOIS BROOK, NEWFOUNDLAND

M U L T I R I S K - F I R E, L I A B I L I T Y A N D
B A S I C C R I M E

OCCUPANCY:

The insured is an owner/occupant at this location. They have been in operation since 1969 and at this location for 19 year(s). They occupy 1104 sq. m and are the major occupant, having 12 employees. The premises are in good condition. The insured is interested in loss prevention, however there have not been any losses during the last 3 years.

* Occupancy Description (Insured / major tenant if insured is non-occupant)

Western Construction occupies this building as a private repair garage. Repairs carried out to insured's construction equipment, mechanical repairs -no body work or spray painting. Parts department with mezzanine storage and offices.

* Other Classes of Occupants

None

* Undersirable Features

None

Risk is Rateable under the Unprotected tariff.
It is recommended that this location be resurveyed in 3 year(s).

BUILDING:

* Built - 1978 (est.) Height: Storey(s) (excluding basement) - 1
* There are no additions.
* There are no renovations.
* Building condition - Good

* Area: Ground Floor - 1104 sq. m Total (including basement) - 1104 sq. m

---

BASIC CONSTRUCTION:

* Walls - 100% Non-combustible - Steel on steel

* Floors - (excluding basement) 100% Concrete

* Roof - 100% - Steel on steel
- Surface material(s) - Metal
- Original roof.

AIS Ref No.: 70832343

WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
0 RD MAIN; BARACHOIS BROOK, NEWFOUNDLAND

INTERIOR FINISH:

* Walls - 10% non-combustible
  - 90% open

* Ceilings - 10% non-combustible
  - 90% open

BASEMENTS: None

VERTICAL OPENINGS:

* Stairs - Protection open

MEZZANINE:

* Construction - plywood on metal joist
* Occupancy - parts storage
* Area - 147 sq. m

OUTBUILDINGS:

* Construction - 30% hollow concrete block/70% steel frame metal clad
  - Occupancy - boiler room and oil storage
  - Condition - Good
  - Area - 110 sq. m

HEATING:

* Suspended Unit Heaters - 20% - Electric
  - Original installation.
  - Installation appears safe

* borrowed steam heat - 80% -
  - Original installation.
  - Installation appears safe

ELECTRICAL:

* Condition - Good and appeared safe at the time of the survey.
* Wiring - Conduit
* Overcurrent protection - Circuit Breakers.
* Electrical system - Original installation.

AIS Ref No.: 70832343

WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
0 RD MAIN; BARACHOIS BROOK, NEWFOUNDLAND

PLUMBING:

* Condition - Good at the time of the survey.
* Piping is Copper, Plastic
* Plumbing - Original installation.

EXPOSURES: (within 15m of the risk):

* FRONT: OPEN

* REAR: OPEN

* LEFT: OPEN

* RIGHT: OPEN

MUNICIPAL PROTECTION:

* The FUS Public Fire Protection Classification is 10
* Responding (volunteer) fire department Barachois Brook
* Distance from risk 2.5-5 km
* Access via Paved roads. Year-round.

* The building itself is easily accesible to the fire department.
* No hydrants within 305m

PRIVATE PROTECTION at this location includes the following:

* Standard extinguishers
* Guard service - For insured

* An automatic sprinkler system is not present.

AIS Ref No.: 70832343

WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
0 RD MAIN; BARACHOIS BROOK, NEWFOUNDLAND

M U L T I R I S K - L I A B I L I T Y

OCCUPANCY - GENERAL INFORMATION

* Neighbourhood is predominantly rural
* Insured - owner/occupant Area occupied - 1104 sq. m
* % accessible to the public could not be determined
* Gross revenue - could not be determined at the time of the survey

---

PREMISES information at the time of this survey

* The following appeared to be SATISFACTORY:

  Stairs, ramps, handrails; Floor surfaces & coverings; Wall & ceilings; Inerior Lighting; Exterior Lighting; Emergency Lighting; Interior Housekeeping; Exterior Housekeeping; Washrooms; Sidewalks, Yards & Parking Lots; Snow & ice removal; Fire exits

* Other features present:

  Guard dogs

* Elevating devices in operation - none

AIS Ref No.: 70832343

WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
0 RD MAIN; BARACHOIS BROOK, NEWFOUNDLAND

M U L T I R I S K - B A S I C C R I M E

NEIGHBOURHOOD:

* Predominantly rural
* Stable
* Best described as having a low crime rate

BUSINESS:

* Description - private repair garage
* Hours of Operation - 8 hours per day, 5 days per week
* Typical Stock - truck parts and accessories

* Smash and Grab exposure could not be determined at time of survey
* There is no safe on the premises

GENERAL PROTECTION at the time of this survey:

* The following appeared to be SATISFACTORY:

  Exterior Lighting, Interior Lighting, Permises fully fenced, Roof Accessability, Outdoor stock protection, Police Patrols

* Security Alarm System - None

PHYSICAL PROTECTION (TENANT or OWNER/OCCUPANT):

* The exterior locks at this location are deadbolt, slide bolt
* The windows are not barred

This report section is designed to provide basic crime information only. More detailed crime information can be obtained by ordering an Expanded Crime Supplement.

AIS Ref No.: 70832343

WESTERN CONSTRUCTION/DIAMOND EQUIPMENT
0 RD MAIN; BARACHOIS BROOK, NEWFOUNDLAND

M U L T I R I S K
R E M A R K S / R E C O M M E N D A T I O N S

REMARKS:

* Fire, Liability & Basic Crime - Insured has several buildings at this site. Yard area is fenced and access is via a normally closed gate. Insured's vehicles and construction equipment is stored at this compound. A watchman is employed during non-working hours. Guard dogs were noted in an enclosed pen.

No recommendations made at this time.

Appendix E
Aerial Photographs

SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 1949 (12241-97)

0 100 200 300m

SCALE: 1:10,000

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

AERIAL PHOTOGRAPH - 1949

11192875

Mar 20, 2019

FIGURE E1

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE01.dwg

SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 1966 (19458-129)

0 100 200 300m

SCALE: 1:10,000

N

GHD

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

AERIAL PHOTOGRAPH - 1966

11192875

Mar 20, 2019

FIGURE E2

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE02.dwg

SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 1973 (73467-81)

0 100 200 300m

SCALE: 1:10,000

N

GHD

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

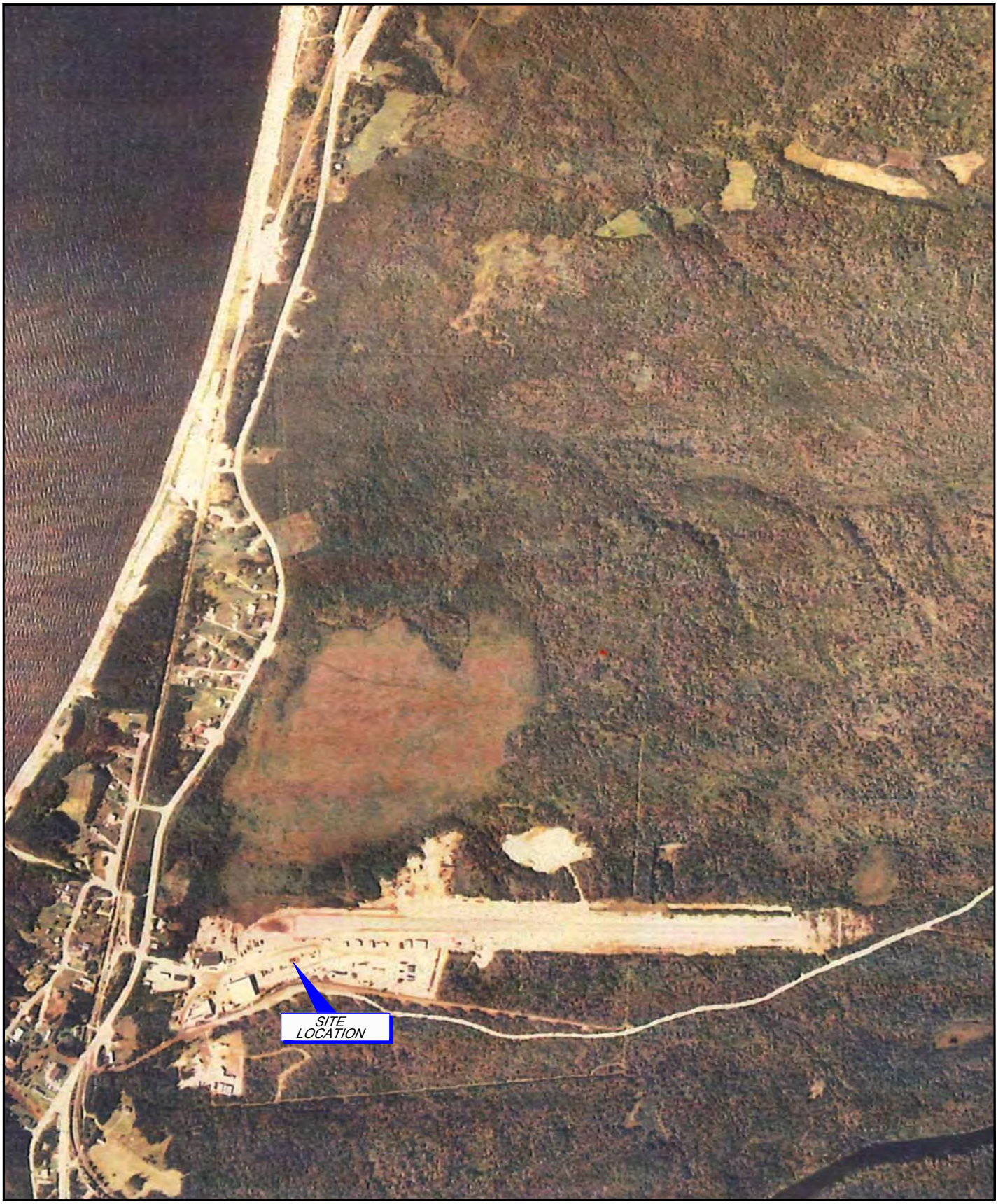
11192875

Mar 20, 2019

AERIAL PHOTOGRAPH - 1973

FIGURE E3

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE03.dwg



SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 1983 (83024-187)

0 75 150 225m

SCALE: 1:7,500

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

11192875

Mar 20, 2019

AERIAL PHOTOGRAPH - 1983

FIGURE E4

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE04.dwg

SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 1997 (97003-111)

0 75 150 225m

SCALE: 1:7,500

N

GHD

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

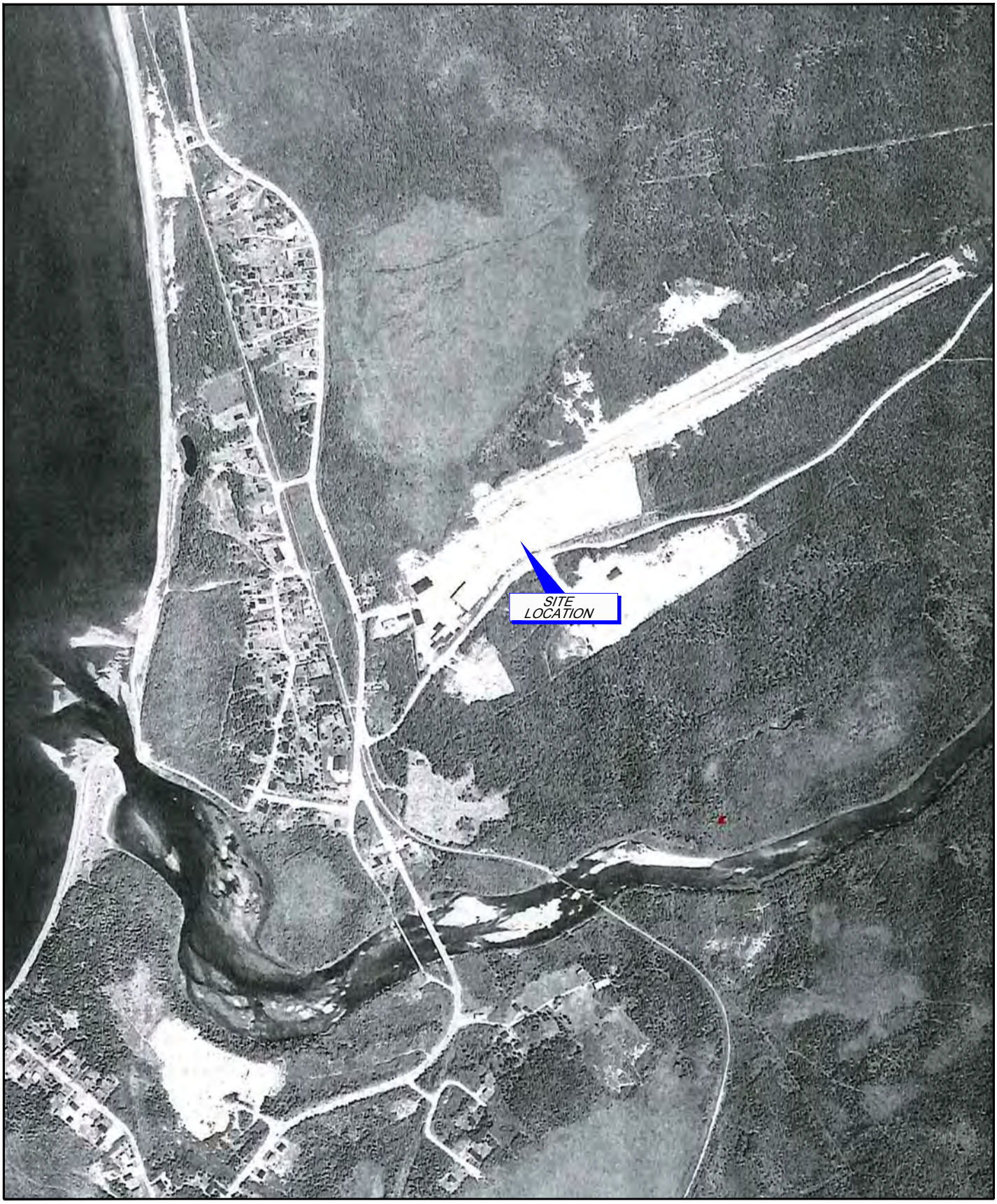
AERIAL PHOTOGRAPH - 1997

11192875

Mar 20, 2019

FIGURE E5

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE05.dwg



SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 2004 (04002-31)

0 75 150 225m

SCALE: 1:7,500

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

11192875

Mar 20, 2019

AERIAL PHOTOGRAPH - 2004

FIGURE E6

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE06.dwg

SOURCE: NL MUNICIPAL AFFAIRS AND ENVIRONMENT AERIAL PHOTO: 2010 (10017-186)

0 75 150 225m

SCALE: 1:7,500

N

GHD

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

AERIAL PHOTOGRAPH - 2010

11192875

Mar 20, 2019

FIGURE E7

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE07.dwg

SOURCE: MICROSOFT PRODUCT SCREEN SHOT(S) REPRINTED WITH PERMISSION FROM MICROSOFT CORPORATION, ACQUISITION DATE [2013], ACCESSED: 2019

0 75 150 225m

SCALE: 1:7,500

N

GHD

BACK HOME GROW
CARTERS ROAD, BARACHOIS BROOK, NL
LIMITED PHASE I ENVIRONMENTAL SITE ASSESSMENT & FILE REVIEW

11192875

Mar 20, 2019

AERIAL PHOTOGRAPH - 2013

FIGURE E8

CAD File: I:\CAD\8-chars\11------\1119----\111928--\11192875\-00\11192875 GN-NLE08.dwg

Appendix F
Previous Environmental Reports

REMEDIAL ACTION IMPLEMENTATION REPORT
WESTERN CONSTRUCTION COMPANY LIMITED
BARACHOIS BROOK, NL

Prepared for:

Springhill Construction Limited
Fredericton, NB

By:

MGI Limited
Fredericton, NB

September 2005

A member of the Family of Companies

MGI Limited
466 Hodgson Road
Fredericton, New Brunswick
Canada E3C 2G5
Tel. 506.458.1248
Fax 506.462.7646
Email mgi.nb@mgi-limited.com
Web www.mgi-limited.com
www.CRAworld.com

September 30, 2005

Springhill Construction Limited
P.O. Box 2100
Fredericton, NB
E3B 4Y6

MGI File: 40338B

Attention: Geoff Colter, P.Eng.,
Vice-President

Re: Report of Remedial Action Plan Implementation,
Western Construction Company Limited, Barachois Brook, NL

Dear Mr. Colter:

We are pleased to submit two copies of the above final report for your files. We have sent two copies of this report to the NL Department of Environment and Conservation. All of the necessary contaminant removal work has been completed and includes removal of petroleum contaminated soil at the settling pond and aesthetic cleanup of stained surface soil at several locations (the pump island, oil shed and various locations in outdoor equipment storage areas). Site Management actions are limited to passive, natural bio-degradation of the F2 and F3 hydrocarbons exceeding ecological screening criteria in the marsh area, maintenance of "no new human occupied buildings" in areas near the pump island and the former settling pond, maintenance of asbestos insulation on the boilers and ensuring that door and trim lead-based paint on the Carpenter Shop is maintained in good condition as indicated in the original Remedial Action Plan.

We trust the completed work meets your present requirements.

Sincerely,
MGI Limited

F. Neil Brodie, P. Eng.
Director of Engineering

for Heather MacDonald, M.Sc., P.Geo.
Project Geologist

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

This report details the works completed to implement the Remedial Action Plan approved by NL Department of the Environment & Conservation (NLDEC) for the Western Construction Company Limited property. The property, henceforth referred to as the site, is owned by Fulco Inc. The site is shown on Figure 1 (Site Location) and Figures 2 and 3 (Site Plan with Sample Locations) in Appendix A.

2.0 SITE DESCRIPTION AND BACKGROUND INFORMATION

The study area is located on the eastern side of Route 461 in Barachois Brook, Newfoundland. The site covers an area of approximately 40 hectares (95 acres) with the buildings located in the southwestern portion of the property. The property is owned by Fulco Inc. and was operated by Western Construction Company Limited until 2001. Marshy and forested land borders the property to the north and east, and an asphalt/concrete plant and forested land to the south. Residential properties are located to the west of the property across Route 461. One residential property is presently used as a Post Office but not occupied as a residence and is located at the southwest corner of the site on the east side of Route 461. An access road (Carter's Road) is the southern property boundary. The site includes five industrial buildings as well as a storage shed, pumphouse, doghouse, two large exterior storage areas, former disposal site and an airstrip. The eastern 75 metres of the airstrip is outside of the property boundaries and is leased from Abitibi Ltd. Site plans are presented as Figures 2 and 3 (Appendix A) and site photographs of the recent site work are included in Appendix B.

A fuel dispensing pump island (minus pumps) is located on the property near the west corner of the repair shop. One steel 13,500 L underground storage tank (UST) used to store diesel and one steel 9,000 L gasoline UST remain in place at the pump island location.

Former gasoline and diesel USTs were located in the vicinity of the oil shed (removed in approximately 1988). Former above ground storage tanks (ASTs) were located adjacent to the boiler building (4,500 L) and paint shop (2,250 L); the ASTs were removed in 2001.

Potable water is provided by two drilled wells located on the property. One well (main) is located southeast of the carpenter shop and one well is located near the pumphouse in the western portion of the site. Sewer services for the property are by private on-site installations.

The portion of the site containing buildings is sloped gently to the northwest. Regional topography slopes to the west toward St. Georges Bay and to the south toward Barachois Brook. Barachois Brook is located approximately 250 metres to the south of the property.

The site has been the subject of previous ESA work reported as noted below:

- Phase I and "Limited" Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NFLD, MGI report dated March 5, 2001;
- Additional Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NFLD, MGI report dated August 15, 2001; and
- Phase III Environmental Site Assessment, Risk Assessment and Remedial Action Plan, Western Construction Company Limited, Barachois Brook, Newfoundland, MGI report dated November 2, 2004.

Sample locations for all intrusive testing to date are shown on Figures 2 and 3 (Appendix A).

A Remedial Action Plan was developed as part of the Phase III ESA and was presented to the NLDEC in November 2004; approval to remediate was received (Appendix C).

3.0 REMEDIAL ACTION PLAN OVERVIEW

The Remedial Action Plan was developed as part of the data review, site inspections and human health risk calculations completed in the Phase III ESA dated November 2, 2004. Section 12 of the Phase III ESA report is attached in Appendix C and summarized below by issue. The areas referenced below are shown on Figures 2 and 3 in Appendix A.

1 - Potential Indoor Air Health Risk at the Repair Shop

Since soil excavation to the depth required would have undermined the Repair Shop and there is a reasonable expectation that indoor air quality is acceptable based on the air exchange rate and size of the building, it was proposed to conduct indoor air sampling under a Tier III approach upon provincial adoption of the proposed Atlantic PIRI Protocol being developed for this.

2 - Potential Indoor Air Health Risk at the Bunkhouse

This location was similarly at risk from soil excavation. Therefore Tier III indoor air sampling was also proposed for this location upon adoption of the Atlantic PIRI Protocol for this.

3 - Aesthetic Cleanup of Stained Surface Soils

Several locations required surface soil cleanup to comply with the provincially adopted policy of no surface soil hydrocarbon staining. Four locations were noted: Pump Island, Oil Shed and various locations at the north and south External Storage Areas. The hydrocarbon impacted soils at each of these sites was proposed to be excavated to depth of up to 1.0 metres as required by field observation.

4 - Settling Pond Remediation

The soil at the Settling Pond required excavation and off-site disposal/treatment at a provincially approved hydrocarbon treatment facility. Other associated Chemicals of Potential Concern (COPC) are at sufficiently low levels to permit this disposal option.

5 - Marsh Area Remediation

No exceedance of the human health risk-based criteria exist in the Marsh Area.

The recommended remedial option is passive, natural bio-degradation of the F2 and F3 hydrocarbons exceeding ecological screening criteria.

Therefore no soil excavation or active remediation was proposed for this area.

6 - Asbestos Containing Materials – Boiler

Insulation sampled as "Boiler 1" from the boiler vessel contained asbestos. The asbestos insulation on the boiler should be repaired (or removed) by a provincially approved company and should be maintained in good condition to eliminate the potential for airborne asbestos fibres. Piping insulation separate from the boiler did not contain asbestos.

7 - Lead-Based Paint on Structures

The Carpenter Shop is the oldest building on-site and trim and door paint had lead levels approximately 40% higher than the Health Canada Regulations for new paint. Trim and door paint on this building should be treated as lead containing and maintained in good condition by regular scraping and repainting with low-lead paint. Paint scrapings should be collected and disposed as hazardous waste. Other structures did not contain lead-based paints.

4.0 REMEDIAL ACTION PLAN IMPLEMENTATION

Remedial work was completed during the period from May 24 to July 18, 2005 by Springhill Construction Limited under the supervision of MGI Limited. Equipment was provided by Whalen Enterprises and by Pardy's Waste Management of Stephenville, NL. It is noted that a total of 521.8 tonnes of soil was removed from the site and transported to the GDH Environmental Inc. soil treatment facility in Stephenville, NL for disposal. Documentation confirming the soil removal is included in Appendix D.

1 - Potential Indoor Air Health Risk at the Repair Shop

An indoor air sample was collected from the repair shop using an air pump (set to 0.2 litres/minute for 6 hours) and charcoal tubes. The sample was submitted to the Research and Productivity Council (RPC) laboratory in Fredericton, NB for volatile organic compounds (VOC) fractionation analysis.

2 - Potential Indoor Air Health Risk at the Bunkhouse

An indoor air sample was collected from the bunkhouse using an air pump (set to 0.2 litres/minute for 6.5 hours) and charcoal tubes. The sample was submitted to the RPC laboratory in Fredericton, NB for VOC fractionation analysis. It is noted that this air test was repeated since the first sample was not fractionated.

3 - Aesthetic Cleanup of Stained Surface Soils

Soil was removed to approximately 1.2 metres depth adjacent to the pump island and to approximately 0.7 metres depth further away from the pump island (3 tandem truck loads). Two soil samples were collected from the base of the excavation and submitted to Maxxam Analytics Inc. (Maxxam) in St. John's, NL for hydrocarbon analyses.

Soil was removed at the oil shed location up to approximately 0.8 metres depth (6 tandem truck loads). Two soil samples were collected from the base of the excavation and submitted to Maxxam for hydrocarbon analysis.

Surface soil was removed from various locations at the two external storage areas, located north and south of the airstrip (9 tandem truck loads).

4 - Settling Pond Remediation

Water and sludge from the Settling Pond excavation was pumped to tanker trucks, and soil was removed to approximately 2.6 metres depth in the centre of the excavation (to native peat moss) and to 1.5 metres depth at the edges of the excavation. Seven confirmatory soil samples were collected from the base and edges of the excavation and submitted to Maxxam for hydrocarbon analyses.

5 - Marsh Area Remediation

The recommended remedial option is passive, natural bio-degradation of the F2 and F3 hydrocarbons exceeding ecological screening criteria.

Therefore no soil excavation or active remediation was proposed for this area.

6 - Asbestos Containing Materials – Boiler

The asbestos insulation on the boiler should be repaired by a provincially approved company and should be maintained in good condition to eliminate the potential for airborne asbestos fibres.

7 - Lead-Based Paint on Structures

Trim and door paint on the Carpenter Shop building should be treated as lead containing and maintained in good condition by regular scraping and repainting with low-lead paint.

5.0 CONFIRMATION OF REMEDIAL ACTION PLAN (RAP) OBJECTIVES

1 - Potential Indoor Air Health Risk at the Repair Shop

Results of the indoor air test completed at the repair shop confirm that human health is not at risk. Test results and data interpretation are included with laboratory certificates in Appendix D.

2 - Potential Indoor Air Health Risk at the Bunkhouse

Results of the indoor air test completed at the bunkhouse confirm that human health is not at risk. Test results and data interpretation are included with laboratory certificates in Appendix D.

3 - Aesthetic Cleanup of Stained Surface Soils

Visual inspection by MGI staff confirmed the removal of surface stained soils. Laboratory results of soil samples collected from the Oil Shed and Pump Island excavations are presented in Table 1 and are compared to the Tier II Risk-Based Remedial Criteria for comparison purposes.

The TPH sample at PI-SS2 (0.7-0.8 m) exceeds the SSTL of 510 mg/kg developed for indoor air but is within the Tier II PSSL for gasoline and soil ingestion/outdoor air of 13,000 mg/kg. The pump island area is a limited use area and no new buildings should be constructed in the area identified on Figure 3.

4 - Settling Pond Remediation

Soil samples collected from the limits of the excavation demonstrated that residual soil is within the Tier II Risk-Based Remedial Criteria. Results are presented in Table 1 and laboratory certificates are included in Appendix D.

5 - Marsh Area Remediation

No confirmation is required for this area.

6 - Asbestos Containing Materials – Boiler

The asbestos insulation repair work is considered to be an issue requiring continued management to mitigate unacceptable human health risk.

7 - Lead-Based Paint on Structures

The maintenance of the lead-based paint on the Carpenter Shop is considered to be an issue requiring continued management to mitigate unacceptable human health risk.

TABLE 1: SOIL ANALYTICAL RESULTS (mg/kg) (May/June 2005)

Sample ID	Depth (m)	Benzene	Toluene	Ethyl Benzene	Xylenes	C6-C10	C11-C21	C22-C36	TPH	Resemblance
Commercial Receptor, Potable Water Use, Coarse-grained Soil										
Pump Island										
Tier II Risk-Based Remedial Criteria		2.2							510	
PI-SS1	1.2-1.3	ND	ND	ND	ND	ND	43	34	76	Weathered fuel oil fraction; lube oil range.
	1.2-1.3 Lab Dup	ND	ND	ND	ND	ND	54	40	94	Weathered fuel oil fraction; lube oil range.
PI-SS2	0.7-0.8	ND	ND	0.04	0.34	11	310	680	990	Weathered fuel oil fraction; lube oil range.
Removed – Pump Island	Removed	ND	ND	0.45	1.3	52	5600	1100	6700	Weathered fuel oil fraction; lube oil fraction.
Settling Pond										
Tier II Risk-Based Remedial Criteria									18,000	
SP-SS1	2.2-2.3	ND	ND	ND	ND	ND	230	2000	2300	Fuel oil range. Unidentified compound in lube range.
SP-SS2	1.0-2.0	ND	ND	0.04	ND	ND	230	690	920	Weathered fuel oil fraction; lube oil fraction.
SP-SS3	2.4-2.6	ND	ND	ND	2.7	ND	380	2600	3000	Fuel oil range. Possible non-petrogenic material in lube range.
SP-SS4	0.5-1.5	ND	ND	0.09	0.31	3.9	5800	7300	13000	Weathered fuel oil fraction. Lube oil fraction.
SP-SS5	0.5-1.5	ND	ND	0.07	0.47	24	2400	4500	7000	Weathered fuel oil fraction. Lube oil fraction.
SP-SS6	0.5-1.5	ND	ND	ND	ND	ND	370	850	1200	Weathered fuel oil fraction. Lube oil fraction.
SP-SS7	0.5-1.5	ND	ND	ND	0.07	ND	560	1000	1600	Weathered fuel oil fraction. Lube oil fraction.
SP. SLUDGE	Removed	ND	0.62	1.1	6.6	190	19000	26000	46000	Unidentified compound in fuel range; lube oil fraction.
Oil Shed										
Tier II Risk-Based Remedial Criteria									16,000	
OS-SS1	0.8-0.9	ND	ND	ND	ND	ND	1400	4900	6200	Weathered fuel oil fraction; lube oil fraction.
OS-SS2	0.8-0.9	ND	ND	ND	ND	4.2	730	980	1700	Weathered fuel oil fraction; lube oil fraction.
Detection Limits		0.03	0.03	0.03	0.05	3	15	15	20	

Note: "ND" Not detected

6.0 SITE MANAGEMENT REQUIREMENTS

As described above, active remediation was not required for the Marsh Area. The recommended remedial option for hydrocarbons exceeding the ecological screening criteria in the Marsh Area is natural bio-degradation. The area shown around the former settling pond and the pump island on Figure 3 are not suitable for human occupancy buildings without additional risk assessment or specialized construction methods to limit indoor air exposure to petroleum hydrocarbons.

In addition, the maintenance of the asbestos insulation on the boilers and the lead-based paint on the Carpenter Shop are considered to require continued management as described in the Remedial Action Plan.

7.0 CONCLUSIONS

The Remedial Action Plan as approved by NLDEC has been completed. Items cited in section 6.0 require on going Site Management. There are no outstanding items of the Remedial Action Plan related to contaminant removal. The continued management of asbestos and lead-based paint is a site management responsibility.

8.0 REFERENCES

Atlantic PIRI, 2003. Atlantic RBCA for Petroleum Impacted Site in Atlantic Canada User Guidance, Version 2.0. Atlantic PIRI Committee, October 2003.

MGI, 2001a. Phase I and "Limited" Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NL, MGI report dated March 5, 2001.

MGI, 2001b. Additional Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NL, MGI report dated August 15, 2001.

MGI, 2004. Phase III Environmental Site Assessment, Risk Assessment and Remedial Action Plan, Western Construction Company Limited, Barachois Brook, Newfoundland, MGI Limited, November 2, 2004.

NLDEC, 2004. Guidance Document for the Management of Impacted Sites, Version 1.0, NLDEC December 2004.

NLDEC, 2005. Policy Directive PPD05-01. NLDEC, February 22, 2005.

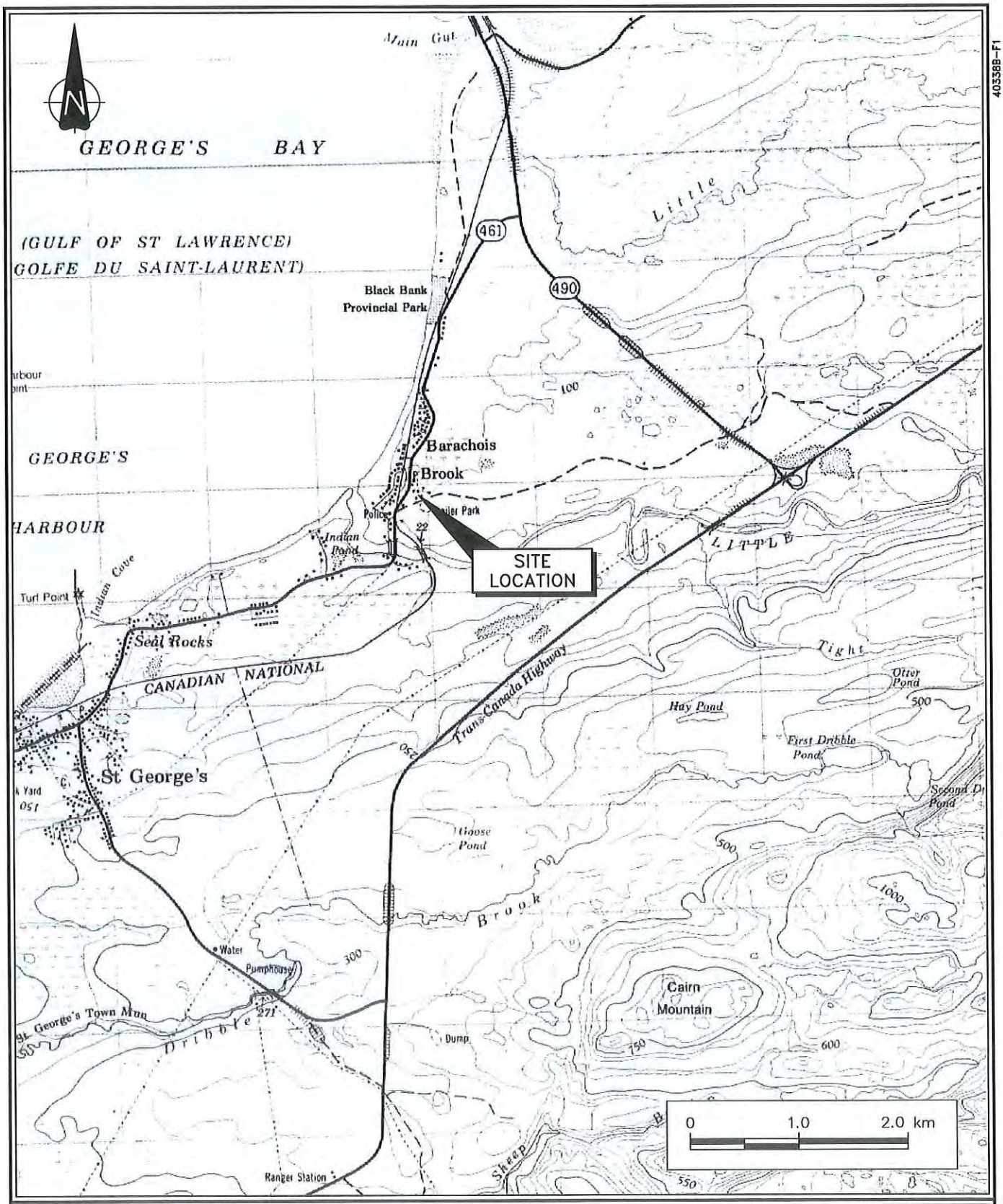
9.0 CLOSING

This report was prepared by Heather MacDonald, P.Geo., and Neil Brodie, P.Eng.

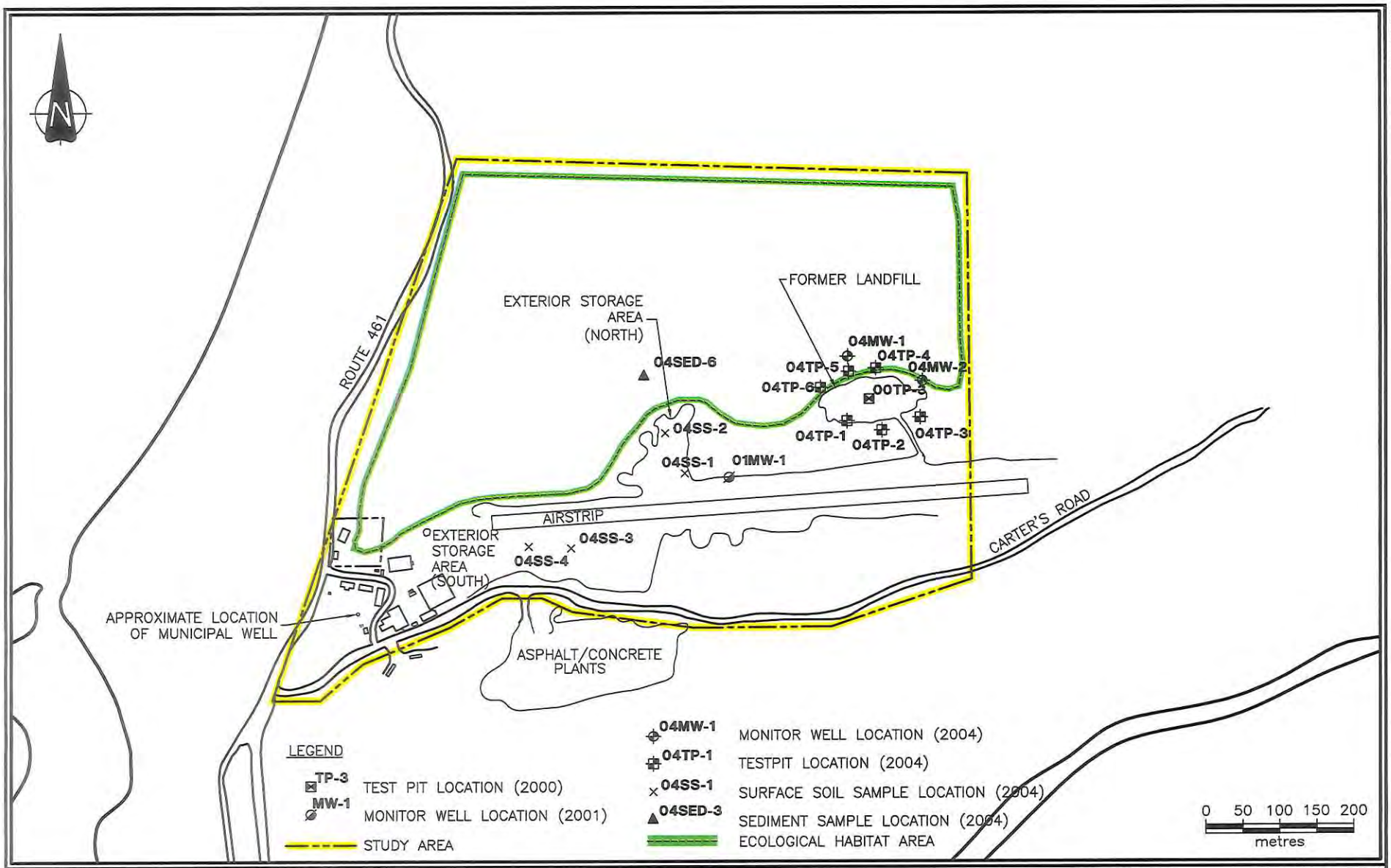
Neil Brodie, P.Eng.

for Heather MacDonald, P.Geo.

APPENDIX A
FIGURES



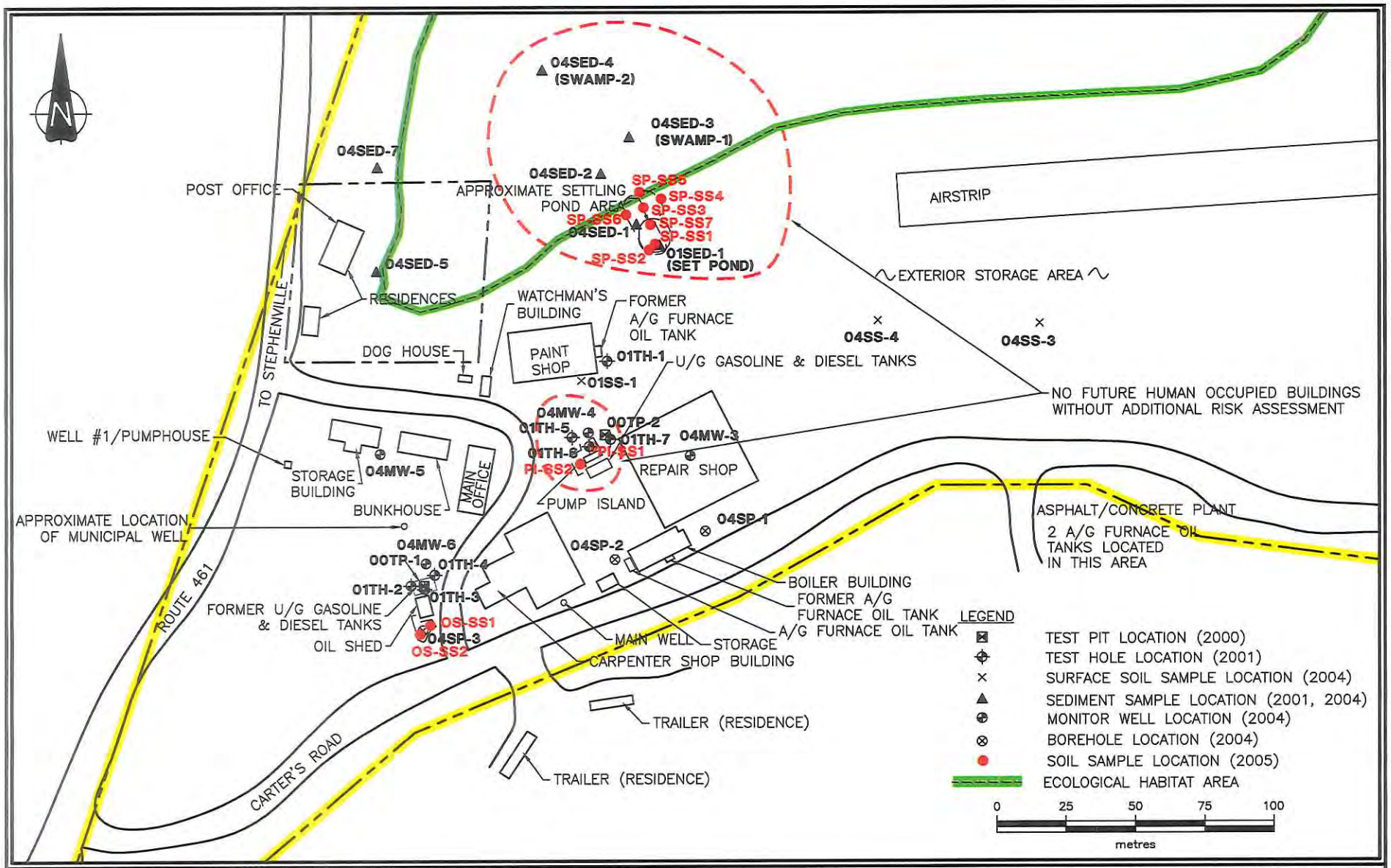
MGI A member of the Family of Companies	TITLE: SITE LOCATION	DATE: Sept. 2005	PROJECT NO.: 40338B
	PROJECT: RAP IMPLEMENTATION WESTERN CONSTRUCTION CO. LTD. ROUTE 461, BARACHOIS BROOK, NL	SCALE: As Noted DRAWN: GBS	FIGURE NO.: 1



40338B-F2B

A member of the Family of Companies

TITLE: SITE PLAN WITH SAMPLE LOCATIONS		DATE: Sept. 2005	PROJECT NO.: 40338B
PROJECT: RAP IMPLEMENTATION WESTERN CONSTRUCTION CO. LTD. ROUTE 461, BARACHOIS BROOK, NL		SCALE: As Noted	FIGURE NO.: 2
		DRAWN: GBS	



MGI
A member of the Family of Companies

TITLE: SITE PLAN WITH SAMPLE LOCATIONS	DATE: Sept. 2005	PROJECT NO.: 40338B
PROJECT: RAP IMPLEMENTATION WESTERN CONSTRUCTION CO. LTD. ROUTE 461, BARACHOIS BROOK, NL	SCALE: As Noted DRAWN: GBS	FIGURE NO.: 3

APPENDIX B
PHOTOGRAPHS

Photo 1: View looking west at Oil Shed excavation.

Photo 2: Water and sludge being removed at Settling Pond excavation.

Photo 3: View looking south at Settling Pond excavation.

Photo 4: View looking northeast at area of remediated Settling Pond.

APPENDIX C
REMEDIAL ACTION PLAN DOCUMENTS

12.0 REMEDIAL ACTION PLAN

Ecological Health Protection

Based on the data review and the professional judgement that remediation of sediments in the Marsh Area downgradient of the Settling Pond would cause greater adverse ecological impact than the present concentrations of petroleum hydrocarbons, the Remedial Action Plan to mitigate F2 and F3 hydrocarbons in the Marsh Area is to permit passive bio-degradation to reduce the concentrations to guideline levels, which is expected to take approximately 10 years.

Human Health Protection

Based on the data review, site inspections and human health risk calculations there are seven areas that require consideration in the Remedial Action Plan. These are detailed below.

2 Potential Indoor Air Health Risk at the Repair Shop

As noted previously, soil excavation to the depth required would undermine the Repair Shop. Since there is a reasonable expectation that indoor air quality is acceptable based on the air exchange rate and size of the building, it is proposed to conduct indoor air or sub-slab soil gas sampling under a Tier III approach upon provincial adoption of the proposed Atlantic PIRI Protocol being developed for this.

3 Potential Indoor Air Health Risk at the Bunkhouse

This location is similarly at risk from soil excavation. Therefore Tier III indoor air or sub-slab soil gas sampling is also proposed for this location upon adoption of the Atlantic PIRI Protocol for this.

4 Aesthetic Cleanup of Stained Surface Soils

Four locations require surface soil cleanup to comply with the provincially adopted policy of no surface soil hydrocarbon staining. Each of the four locations is noted below with an estimate of the anticipated amount that would require excavation and off-site disposal at a provincially approved hydrocarbon treatment facility. The hydrocarbon impacted soils at each of these sites will be excavated to depth of up to 1.0 metres as required by field observation.

TABLE 15: SURFACE SOIL CLEANUP AREAS

LOCATION	EXCAVATION ESTIMATE (tonnes)
Pump Island	20
Oil Shed	40
External Storage Area - North	50
External Storage Area - South	20

5 Settling Pond Remediation

The Settling Pond requires excavation and off-site disposal/treatment at a provincially approved hydrocarbon treatment facility. As previously outlined, other associated COPC are at sufficiently low levels to permit this disposal option.

The estimated amount of soil to be excavated is 400 tonnes.

6 Marsh Area Remediation

No exceedence of the human health risk-based criteria exist in the Marsh Area.

As presented in Section 10.0: Ecological Considerations, the recommended remedial option is passive, natural bio-degradation of the F2 and F3 hydrocarbons exceeding ecological screening criteria.

Therefore no soil excavation or active remediation is proposed for this area.

7 Asbestos Containing Materials – Boiler

Insulation sampled as "Boiler 1" from the boiler vessel contained asbestos. The asbestos insulation on the boiler should be removed and disposed by a provincially approved company or repaired and maintained in good condition to eliminate the potential for airborne asbestos fibres. Piping insulation separate from the boiler did not contain asbestos.

8 Lead-Based Paint on Structures

The Carpenter Shop is the oldest building on site and trim and door paint had lead levels approximately 40% higher than the Health Canada Regulations for new paint. Trim and door paint on this building should be treated as lead containing and maintained in good condition by regular scraping and repainting with low-lead paint. Paint scrapings should be collected and disposed as hazardous waste. Other structures did not contain lead-based paints.

13.0 CONCLUSIONS

MGI Limited completed additional site assessment at the Western Construction Company property in Barachois Brook in May 2004 to address additional areas of investigation requested by NL Department of Environment & Conservation. Previous phased site assessment had been completed during 2000 and 2001. The additional work resulted in an intrusive work program totalling 6-test pits, 10-boreholes, 6-monitor wells, 4-surface soil samples, 6-sediment samples, 2-surface water samples and samples of paint and asbestos. Parameters analysed included BTEX/TPH, metals, PAH, PCB and VOC. In addition, three potable groundwater wells (two on-site and one municipal) were sampled in 2001 and 2004. Selected samples were analysed for hydrocarbon fractionation to be used in risk assessment calculations.

All site data was compared to a set of human health and ecological screening criteria drawn from primarily Canadian sources. Site data that exceeded screening criteria was subjected to human health risk assessment and review for ecological health considerations. Human health risk assessment was completed for lead and nickel by the CCME Protocol (CCME. 1996) since only these two non-hydrocarbon parameters exceeded screening criteria. Human health risk assessment was completed for BTEX/TPH using Atlantic RBCA (Atlantic PIRI, 2003).

Ecological screening indicated Chemicals of Potential Concern to be nickel in soil, F2 and F3 hydrocarbons in sediment, lead, nickel and zinc in sediment, 1-methylnaphthalene, fluorine, phenanthrene and pyrene in sediment, copper pyrene, fluoranthene and chloroform in groundwater and F2 hydrocarbons in surface water. Only F2 and F3 hydrocarbons in sediment were of significant concern.

Human health risk assessment identified potentially unacceptable risk from indoor air inhalation at the Repair Shop and the Bunkhouse as occupied buildings. The Settling Pond contained sediment/soil that exceeded risk-based criteria for petroleum hydrocarbons. Four locations were identified as having surface staining due to petroleum hydrocarbons that require removal under provincial guidelines.

The risk assessment assumed continued commercial use of the property.

Lead based paint and asbestos-containing boiler insulation were identified as issues requiring continued management to mitigate unacceptable human health risk.

A Remedial Action Plan was prepared containing the following elements:

1. Potential Indoor Air Health Risk at the Repair Shop

Address by conducting confirmation sampling of indoor air or sub-slab soil gas hydrocarbon concentrations under a Tier III approach upon provincial adoption of the Atlantic PIRI Protocol presently under development.

2. Potential Indoor Air Health Risk at the Bunkhouse

Same action as item 1.

3. Aesthetic Cleanup of Stained Surface Soils

Excavate surface soil at four locations to comply with the provincially adopted policy of no surface soil hydrocarbon staining and dispose at a provincially approved hydrocarbon treatment facility. The total estimated quantity is 130 tonnes.

4. Settling Pond Remediation

Complete soil excavation and off-site disposal/treatment at a provincially approved hydrocarbon treatment facility for soil exceeding the risk-based criterion for this location. The estimated amount of soil to be excavated is 400 tonnes.

5. Marsh Area Remediation

No soil excavation or active remediation is proposed for this area. The recommended remedial option due to potential adverse ecological impact is passive, natural bio-degradation of the F2 and F3 hydrocarbons exceeding ecological screening criteria.

6. Asbestos Containing Materials – Boiler

The asbestos insulation on the boiler should be removed and disposed by a provincially approved company or repaired and maintained in good condition to eliminate the potential for airborne asbestos particles.

7. Lead-Based Paint on Structures

Trim and door paint on the Carpenter Shop building should be treated as lead containing and maintained in good condition by regular scraping and repainting with low-lead paint. Paint scrapings should be collected and disposed as hazardous waste.

14.0 REFERENCES

Atlantic PIRI 2003. Atlantic RBCA for Petroleum Impacted Sites in Atlantic Canada, User Guidance, Atlantic PIRI Committee, October 2003.

British Columbia, 1997. British Columbia Contaminated Sites Regulation # 375/96, Province of British Columbia, April 1, 1997.

CCME, 1996. A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines, Canadian Council of Ministers of the Environment, Report No. CCME-EPC-101E, March 1996.

CCME, 2001. Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil, Canadian Council of Ministers of the Environment, Technical Supplement, January 2001.

CCME, 2003. Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 3.2, December 2003.

Health Canada, 2003a. Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Screening Level Risk Assessment (SLRA), Version 1.1, October 3, 2003.

Health Canada, 2003b. Federal Contaminated Site Risk Assessment in Canada, Part II: Health Canada Toxicological Reference Values (TRVs), Version 1.0, October 3, 2003.

MGI Limited, 2001. Phase I and "Limited" Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NFLD, report prepared for Diamond Construction (1961) Ltd., dated March 5, 2001.

MGI Limited, 2001. Additional Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NFLD, report prepared for Diamond Construction (1961) Ltd., dated August 15, 2001.

Brodie, Neil

From: Craig Bugden [CBugden@gov.nl.ca]
Sent: Tuesday, November 23, 2004 4:02 PM
To: Brodie, Neil
Cc: Derrick Maddocks; Toby Matthews
Subject: Re: Western Construction - Barachois Brook, NL

Neil:

Further to your Powerpoint presentation of November 18 and with reference to the Remedial Action Plan in Section 12.0 of the Phase III report, the Department approves your request to remediate the area of stained surficial soils and the soils in and around the settling pond. Please submit a post-remediation report when available to document the proposed activities and include a sufficient number of confirmatory samples.

We understand that site closure is not being requested at this time nor is the Department in a position to consider same until the report has been reviewed in more detail and until the Remedial Action Plan as proposed has been approved and completed in its entirety.

Regards,

Craig Bugden
(709) 729-3685

>>> "Brodie, Neil" <neil.brodie@mgi-limited.com> 11/23/2004 9:43:22 AM
>>>
You said verbally we were OK to proceed with the requested excavation proposal in our report and PowerPoint presentation.
Can you confirm by return e-mail.
Thanks,
Neil

Neil Brodie, MGI Limited, 466 Hodgson Road, Fredericton, NB E3C 2G5
Phone: (506) 458-1248 Direct Line: (506) 462-7631 Cell: (506) 461-5639

Fax: (506) 462-7646 E-mail: neil.brodie@mgi-limited.com
Web Sites: www.mgi-limited.com and www.CRAworld.com

APPENDIX D
CONFIRMATION DOCUMENTATION

1.0 TIER III INDOOR AIR QUALITY TESTING

Two issues in the Remedial Action Plan (MGI Limited, 2004) required the assessment of indoor air quality using direct measurements of the building breathing air. The two locations that failed the Tier II SSTLs for hydrocarbons (indoor air pathway) were the Bunkhouse and the Repair Shop.

Each location was tested using equipment rented from RPC Laboratories of Fredericton, NB. Equipment consisted of an adjustable flow pump that drew interior building air representative of occupant's breathing space at a rate of 0.2 litres/minute through an absorptive carbon tube. The Bunkhouse air sampler was run for 6.5 hours on July 25, 2005 and the Repair Shop air sampler was run for 6 hours on July 6, 2005.

Western Construction Company Limited
Barachois Brook, NL

INDOOR AIR HYDROCARBON CONCENTRATIONS

Hydrocarbon Fraction	Atlantic PIRI (2003) Reference Concentration RfC (mg/m3)	On-Site Measured Concentration (mg/m3)	
		Repair Shop July 2005	Bunkhouse July 2005
Benzene	0.003	0.005 * Note 1	0.005 * Note 1
Toluene (same as AR >C7-C8)	0.4	0.005 *	0.005 *
Ethylbenzene (E)	1.0	0.005 *	0.005 *
Xylenes (X)	0.18	0.005 *	0.005 *
Aliphatic >C6-C8	18.4	0.015 * Note 2	0.17 Note 2
Aromatic >C7-C8	0.4		
Aliphatic >C8-C10	1.0		
Aromatic >C8-C10 (less EX)	0.2		
Aliphatic >C10-C12	1.0	0.05 * Note 2	0.22 Note 3 .04
Aromatic >C10-C12	0.2		
Aliphatic >C12-C16	1.0		
Aromatic >C12-C16	0.2		
Aromatic >C16-C21	0.03		
Aliphatic >C16-C21	2.0		
Aliphatic >C21-C35	2.0	Not measured	Not measured
Aromatic >C21-C35	0.03		

"*" less than detection level and reported as half detection level

Note 1: Measured values were non-detect but detection level was higher than the calculated RfC based on the Atlantic PIRI Risk Specific Concentration. The benzene concentrations are not considered a human health risk since the Risk Specific Concentration is based on lifetime exposure in a residential setting.

Note 2: Concentration of the sum of the sub-fractions is less than the lowest sub-fraction RfC

Note 3: Concentration of the sum of the sub-fractions is 10% greater than the lowest sub-fraction RfC which is for aromatic fractions. Considering that the typical aromatic/aliphatic mass ratio is 20/80, the sum result is considered not to reflect a human health risk.

rpc
The Technical Solutions Centre
Le centre de solutions techniques

Reference Number: 51040-PET

Date: August 3, 2005

Client: MGI Limited
466 Hodgson Road
Fredericton, NB E3C 2G5

Hydrocarbon Analysis

Project No: 40338B

One (1) charcoal tube was received on July 6, 2005. The tube was analysed for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) (A-RBCA). The results are found in Table 1.

Table 1: TPH Results

Component	Repair Shop (mg/m^3)
>C10-C21 Hydrocarbons	<0.1
C6-C10 (less BTEX)	<0.03
Benzene	<0.01
Toluene	<0.01
Ethylbenzene	<0.01
Xylenes	<0.01

Erin Craig
Analyst

Thelma Green
Manager

921 ch College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.1395
www.rpc.ca

rpc
The Technical Solutions Centre
Le centre de solutions techniques

Reference Number: 51619-PET

Date: August 5, 2005

MGI Fredericton
AUG 12 2005
RECEIVED

Client: Neil Brodie
MGI Limited
466 Hodgson Road
Fredericton, NB E3C 2G5

Hydrocarbon Analysis

Project No: 40338B

One (1) charcoal tube was received on July 25, 2005. The tube was analysed for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) (A-RBCA). The results are found in Table 1.

Table 1: TPH Results

Component	~~Basement~~ Bunkhouse (mg/m^3)
>C10-C21 Hydrocarbons	0.22
C6-C10 (less BTEX)	0.17
Benzene	<0.01
Toluene	<0.01
Ethylbenzene	<0.01
Xylenes	<0.01

E. Craig
Erin Craig
Analyst

Thelma Green
Manager

921 ch College Hill Rd
Fredericton NB
Canada E3B 6Z9
Tel: 506.452.1212
Fax: 506.452.1395
www.rpc.ca

rpc
The Technical Solutions Centre
Le centre de solutions techniques

Reference Number: 50444-PET

Date: June 23, 2005

Client: Neil Brodie
MGI Limited
466 Hodgson Road
Fredericton, NB E3C 2G5

MGI Fredericton
JUN 28 2005
RECEIVED

HYDROCARBON ANALYSIS
(Project No. 40338B)

One (1) sample was received on June 15, 2005 for hydrocarbon analysis. The samples were analysed following National Institute for Occupational Safety and Health (NIOSH) Method 1500. The results can be found in the following table.

Sample Identification	TVOC* (µg)
Bunkhouse	60

* Total Volatile Organic Compounds.
Samples have been corrected for lab blank.
Results based on O-Xylene.

We trust that you will find this information to be useful and that you will call if you have any questions about this report.

E. Craig
Erin Craig
Air Quality Technician

Thelma Green
Manager

921 ch College Hill Rd
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Tel: 506.452.1212
Fax: 506.452.1395
www.rpc.ca

MGI Limited
466 Hodgson Rd
Fredericton, NB
E3C 2G5

Attention: NEIL BRODIE

Report Date: 2005/06/29

Your Project #: 40338B
Your C.O.C. #: 321477

ANALYTICAL REPORT

MAXXAM JOB #: A558401
Received: 2005/06/24, 15:42

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1)	5	2005/06/28	2005/06/28	SOP 9775	Based on Atl. PIRI
Moisture	5	N/A	2005/06/28	SOP 9740	MOE Handbook 1983
VPH in Soil (PIRI) (1)	5	2005/06/28	2005/06/28	SOP 9785	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil (1)	5	2005/06/28	2005/06/29		Based on Atl. PIRI

(1) SCC/CAEAL

MAXXAM ANALYTICS INC.

Total cover pages: 1

Maxxam Job #: A558401
Report Date: 2005/06/29

MGI Limited
Client Project #: 40338B
Project name:
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G83950		G83955	G83956	G83957		
Sampling Date		2005/06/21		2005/06/21	2005/06/21	2005/06/21		
COC Number		321477		321477	321477	321477		
	Units	**SP-SS3**	**DL**	**SP-SS4**	**SP-SS5**	**SP-SS6**	**DL**	**QC Batch**
Physical Properties								
Moisture	%	89	1	22	37	13	1	768465
Hydrocarbons								
>C10-C21 Hydrocarbons	mg/kg	380	15	5800	2400	370	15	768463
>C21-<C32 Hydrocarbons	mg/kg	2600	15	7300	4500	850	15	768463
Modified TPH (Tier1)	mg/kg	3000	20	13000	7000	1200	20	768383
Volatile Hydrocarbons								
Benzene	mg/kg	ND	0.05	ND	ND	ND	0.03	768459
Toluene	mg/kg	ND	0.05	ND	ND	ND	0.03	768459
Ethylbenzene	mg/kg	ND	0.05	0.09	0.07	ND	0.03	768459
Xylene (Total)	mg/kg	2.7	0.05	0.31	0.47	ND	0.05	768459
C6 - C10 (less BTEX)	mg/kg	ND	5	3.9	24	ND	3	768459
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	104		91	90	100		768463
n-Dotriacontane - Extractable	%	104		95	108	108		768463
Isobutylbenzene - Volatile	%	!!142		!!54	103	98		768459

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

Maxxam Job #: A558401
Report Date: 2005/06/29

MGI Limited
Client Project #: 40338B
Project name:
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G83958		
Sampling Date		2005/06/21		
COC Number		321477		
	Units	**SP-SS7**	**DL**	**QC Batch**
Physical Properties				
Moisture	%	37	1	768465
Hydrocarbons				
>C10-C21 Hydrocarbons	mg/kg	560	15	768463
>C21-<C32 Hydrocarbons	mg/kg	1000	15	768463
Modified TPH (Tier1)	mg/kg	1600	20	768383
Volatile Hydrocarbons				
Benzene	mg/kg	ND	0.03	768459
Toluene	mg/kg	ND	0.03	768459
Ethylbenzene	mg/kg	ND	0.03	768459
Xylene (Total)	mg/kg	0.07	0.05	768459
C6 - C10 (less BTEX)	mg/kg	ND	3	768459
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	100		768463
n-Dotriacontane - Extractable	%	107		768463
Isobutylbenzene - Volatile	%	107		768459

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

Maxxam Job #: A558401
Report Date: 2005/06/29

MGI Limited
Client Project #: 40338B
Project name:
Sampler Initials: SA

GENERAL COMMENTS

Sample G83950-01: Elevated VPH DL(s) due to sample dilution.
Fuel oil range. Possible non-petrogenic material in lube range.

Sample G83955-01: VPH surrogate not within acceptance limits due to matrix/co-extractive interference.
Weathered fuel oil fraction. Lube oil fraction.

Sample G83956-01: Weathered fuel oil fraction. Lube oil fraction.

Sample G83957-01: Weathered fuel oil fraction. Lube oil fraction.

Sample G83958-01: Weathered fuel oil fraction. Lube oil fraction.

Results relate only to the items tested.

MGI Limited
Attention: NEIL BRODIE
Client Project #: 40338B
P.O. #:
Project name:

Quality Assurance Report

Maxxam Job Number: ZA558401

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
768383 RWH	RPD	Modified TPH (Tier1)	2005/06/29	8.5		%	N/A
768459 BRD	Spiked Blank	Isobutylbenzene - Volatile	2005/06/28		97	%	60 - 140
		Benzene	2005/06/28		96	%	60 - 140
		Toluene	2005/06/28		96	%	60 - 140
		Ethylbenzene	2005/06/28		95	%	60 - 140
		Xylene (Total)	2005/06/28		97	%	60 - 140
		C6 - C10 (less BTEX)	2005/06/28		83	%	N/A
	Method Blank	Isobutylbenzene - Volatile	2005/06/28		97	%	60 - 140
		Benzene	2005/06/28	ND, DL=0.025		mg/kg	
		Toluene	2005/06/28	ND, DL=0.025		mg/kg	
		Ethylbenzene	2005/06/28	ND, DL=0.025		mg/kg	
		Xylene (Total)	2005/06/28	ND, DL=0.05		mg/kg	
		C6 - C10 (less BTEX)	2005/06/28	ND, DL=3		mg/kg	
	RPD	Benzene	2005/06/28	NC		%	50
		Toluene	2005/06/28	NC		%	50
		Ethylbenzene	2005/06/28	NC		%	50
		Xylene (Total)	2005/06/28	!! 72.0		%	50
		C6 - C10 (less BTEX)	2005/06/28	NC		%	50
768463 DDE	MATRIX SPIKE	Isobutylbenzene - Extractable	2005/06/28		100	%	30 - 130
		n-Dotriacontane - Extractable	2005/06/28		109	%	30 - 130
		>C10-C21 Hydrocarbons	2005/06/28		104	%	30 - 130
		>C21-<C32 Hydrocarbons	2005/06/28		99	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2005/06/28		95	%	30 - 130
		n-Dotriacontane - Extractable	2005/06/28		101	%	30 - 130
		>C10-C21 Hydrocarbons	2005/06/28		102	%	30 - 130
		>C21-<C32 Hydrocarbons	2005/06/28		102	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2005/06/28		99	%	30 - 130
		n-Dotriacontane - Extractable	2005/06/28		103	%	30 - 130
		>C10-C21 Hydrocarbons	2005/06/28	ND, DL=15		mg/kg	
		>C21-<C32 Hydrocarbons	2005/06/28	ND, DL=15		mg/kg	
	RPD	>C10-C21 Hydrocarbons	2005/06/28	14.6		%	50
		>C21-<C32 Hydrocarbons	2005/06/28	7.7		%	50
768465 GMA	RPD	Moisture	2005/06/28	0.7		%	N/A

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
SPIKE = Fortified sample

Maxxam Job #: A558401
Report Date: 2005/06/29

MGI Limited
Client Project #: 40338B
Project name:
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G83950		G83955	G83956	G83957	G83958		
Sampling Date		6/21/2005		6/21/2005	6/21/2005	6/21/2005	6/21/2005		
COC Number		321477		321477	321477	321477	321477		
	Units	**SP-SS3**	**DL**	**SP-SS4**	**SP-SS5**	**SP-SS6**	**SP-SS7**	**DL**	**QC Batch**
Physical Properties									
Moisture	%	89	1	22	37	13	37	1	768465
Hydrocarbons									
>C10-C21 Hydrocarbons	mg/kg	380	15	5800	2400	370	560	15	768463
>C21-<C32 Hydrocarbons	mg/kg	2600	15	7300	4500	850	1000	15	768463
Modified TPH (Tier1)	mg/kg	3000	20	13000	7000	1200	1600	20	768383
Volatile Hydrocarbons									
Benzene	mg/kg	ND	0.05	ND	ND	ND	ND	0.03	768459
Toluene	mg/kg	ND	0.05	ND	ND	ND	ND	0.03	768459
Ethylbenzene	mg/kg	ND	0.05	0.09	0.07	ND	ND	0.03	768459
Xylene (Total)	mg/kg	2.7	0.05	0.31	0.47	ND	0.07	0.05	768459
C6 - C10 (less BTEX)	mg/kg	ND	5	3.9	24	ND	ND	3	768459
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	104		91	90	100	100		768463
n-Dotriacontane - Extractable	%	104		95	108	108	107		768463
Isobutylbenzene - Volatile	%	!!142		!!54	103	98	107		768459

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

GENERAL COMMENTS

Sample G83950-01: Elevated VPH DL(s) due to sample dilution.
Fuel oil range. Possible non-petrogenic material in lube range.
Sample G83955-01: VPH surrogate not within acceptance limits due to matrix/co-extractive interference.
Weathered fuel oil fraction. Lube oil fraction.
Sample G83956-01: Weathered fuel oil fraction. Lube oil fraction.
Sample G83957-01: Weathered fuel oil fraction. Lube oil fraction.
Sample G83958-01: Weathered fuel oil fraction. Lube oil fraction.

Results relate only to the items tested.
This report dated: 2005/06/29 replaces all previous reports.

MGI Limited
Attention: NEIL BRODIE
Client Project #: 40338B
P.O. #:
Project name:

Quality Assurance Report
Maxxam Job Number: ZA558401

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
768383	RWH	RPD	Modified TPH (Tier1)	6/29/2005	8.5		%	N/A
768459	BRD	Spiked Blank	Isobutylbenzene - Volatile	6/28/2005		97	%	60 - 140
			Benzene	6/28/2005		96	%	60 - 140
			Toluene	6/28/2005		96	%	60 - 140
			Ethylbenzene	6/28/2005		95	%	60 - 140
			Xylene (Total)	6/28/2005		97	%	60 - 140
			C6 - C10 (less BTEX)	6/28/2005		83	%	N/A
		Method Blank	Isobutylbenzene - Volatile	6/28/2005		97	%	60 - 140
			Benzene	6/28/2005	ND	DL=0.025	mg/kg	
			Toluene	6/28/2005	ND	DL=0.025	mg/kg	
			Ethylbenzene	6/28/2005	ND	DL=0.025	mg/kg	
			Xylene (Total)	6/28/2005	ND	DL=0.05	mg/kg	
			C6 - C10 (less BTEX)	6/28/2005	ND	DL=3	mg/kg	
		RPD	Benzene	6/28/2005	NC		%	50
			Toluene	6/28/2005	NC		%	50
			Ethylbenzene	6/28/2005	NC		%	50
			Xylene (Total)	6/28/2005	!! 72.0		%	50
			C6 - C10 (less BTEX)	6/28/2005	NC		%	50
768463	DDE	MATRIX SPIKE	Isobutylbenzene - Extractable	6/28/2005		100	%	30 - 130
			n-Dotriacontane - Extractable	6/28/2005		109	%	30 - 130
			>C10-C21 Hydrocarbons	6/28/2005		104	%	30 - 130
			>C21-<C32 Hydrocarbons	6/28/2005		99	%	30 - 130
		Spiked Blank	Isobutylbenzene - Extractable	6/28/2005		95	%	30 - 130
			n-Dotriacontane - Extractable	6/28/2005		101	%	30 - 130
			>C10-C21 Hydrocarbons	6/28/2005		102	%	30 - 130
			>C21-<C32 Hydrocarbons	6/28/2005		102	%	30 - 130
		Method Blank	Isobutylbenzene - Extractable	6/28/2005		99	%	30 - 130
			n-Dotriacontane - Extractable	6/28/2005		103	%	30 - 130
			>C10-C21 Hydrocarbons	6/28/2005	ND	DL=15	mg/kg	
			>C21-<C32 Hydrocarbons	6/28/2005	ND	DL=15	mg/kg	
		RPD	>C10-C21 Hydrocarbons	6/28/2005	14.6		%	50
			>C21-<C32 Hydrocarbons	6/28/2005	7.7		%	50
768465	GMA	RPD	Moisture	6/28/2005	0.7		%	N/A

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
SPIKE = Fortified sample

MGI Limited
466 Hodgson Rd
Fredericton, NB
E3C 2G5

Attention: Heather MacDonald

Report Date: 2005/05/30

Your P.O. #: 40338B
Your Project #: 40338B
Your C.O.C. #: 320689

ANALYTICAL REPORT

MAXXAM JOB #: A545805
Received: 2005/05/27, 08:40

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1)	1	2005/05/27	2005/05/27	SOP 9775	Based on Atl. PIRI
Moisture	1	N/A	2005/05/30	SOP 9740	MOE Handbook 1983
VPH in Soil (PIRI) (1)	1	2005/05/27	2005/05/27	SOP 9785	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil (1)	1	2005/05/30	2005/05/30		Based on Atl. PIRI

(1) SCC/CAEAL

MAXXAM ANALYTICS INC.

ROB WHELAN

RWH/rwh
encl.

Total cover pages: 1

Maxxam Job #: A545805
Report Date: 2005/05/30

MGI Limited
Client Project #: 40338B
Project name:
Your P.O. #: 40338B
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G28628		
Sampling Date		2005/05/25		
COC Number		320689		
	Units	**SP. SLUDGE**	**DL**	**QC Batch**
Physical Properties				
Moisture	%	54	1	746368
Hydrocarbons				
>C10-C21 Hydrocarbons	mg/kg	19000	15	746365
>C21-<C32 Hydrocarbons	mg/kg	26000	15	746365
Modified TPH (Tier1)	mg/kg	46000	20	747726
Volatile Hydrocarbons				
Benzene	mg/kg	ND	0.03	746359
Toluene	mg/kg	0.62	0.03	746359
Ethylbenzene	mg/kg	1.1	0.03	746359
Xylene (Total)	mg/kg	6.6	0.05	746359
C6 - C10 (less BTEX)	mg/kg	190	3	746359
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	!!15		746365
n-Dotriacontane - Extractable	%	71		746365
Isobutylbenzene - Volatile	%	!!51		746359

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

Maxxam Job #: A545805
Report Date: 2005/05/30

MGI Limited
Client Project #: 40338B
Project name:
Your P.O. #: 40338B
Sampler Initials: SA

GENERAL COMMENTS

Sample G28628-01: VPH surrogate not within acceptance limits due to matrix/co-extractive interference.
Unidentified compound(s) in fuel range. Lube oil fraction. TEH surrogate(s) not within acceptance limits due to sample dilution.

Results relate only to the items tested.

MGI Limited
Attention: Heather MacDonald
Client Project #: 40338B
P.O. #: 40338B
Project name:

Quality Assurance Report

Maxxam Job Number: ZA545805

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
746359 BRD	Spiked Blank	Isobutylbenzene - Volatile	2005/05/27		95	%	60 - 140
		Benzene	2005/05/27		113	%	60 - 140
		Toluene	2005/05/27		97	%	60 - 140
		Ethylbenzene	2005/05/27		95	%	60 - 140
		Xylene (Total)	2005/05/27		97	%	60 - 140
		C6 - C10 (less BTEX)	2005/05/27		112	%	N/A
	Method Blank	Isobutylbenzene - Volatile	2005/05/27		95	%	60 - 140
		Benzene	2005/05/27	ND, DL=0.025		mg/kg	
		Toluene	2005/05/27	ND, DL=0.025		mg/kg	
		Ethylbenzene	2005/05/27	ND, DL=0.025		mg/kg	
		Xylene (Total)	2005/05/27	ND, DL=0.05		mg/kg	
		C6 - C10 (less BTEX)	2005/05/27	ND, DL=3		mg/kg	
	RPD	Benzene	2005/05/27	NC		%	50
		Toluene	2005/05/27	NC		%	50
		Ethylbenzene	2005/05/27	NC		%	50
		Xylene (Total)	2005/05/27	NC		%	50
		C6 - C10 (less BTEX)	2005/05/27	NC		%	50
746365 DDE	MATRIX SPIKE	Isobutylbenzene - Extractable	2005/05/27		95	%	30 - 130
		n-Dotriacontane - Extractable	2005/05/27		96	%	30 - 130
		>C10-C21 Hydrocarbons	2005/05/27		89	%	30 - 130
		>C21-<C32 Hydrocarbons	2005/05/27		82	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2005/05/27		90	%	30 - 130
		n-Dotriacontane - Extractable	2005/05/27		95	%	30 - 130
		>C10-C21 Hydrocarbons	2005/05/27		93	%	30 - 130
		>C21-<C32 Hydrocarbons	2005/05/27		95	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2005/05/27		93	%	30 - 130
		n-Dotriacontane - Extractable	2005/05/27		95	%	30 - 130
		>C10-C21 Hydrocarbons	2005/05/27	ND, DL=15		mg/kg	
		>C21-<C32 Hydrocarbons	2005/05/27	ND, DL=15		mg/kg	
	RPD	>C10-C21 Hydrocarbons	2005/05/27	0.2		%	50
		>C21-<C32 Hydrocarbons	2005/05/27	NC		%	50
746368 GMA	RPD	Moisture	2005/05/30	3.6		%	N/A
747726 RWH	RPD	Modified TPH (Tier1)		1.0		%	N/A

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
SPIKE = Fortified sample

Maxxam Job #: A545805
Report Date: 2005/05/30

MGI Limited
Client Project #: 40338B
Project name:
Your P.O. #: 40338B
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G28628		
Sampling Date		5/25/2005		
COC Number		320689		
	Units	**SP. SLUDGE**	**DL**	**QC Batch**
Physical Properties				
Moisture	%	54	1	746368
Hydrocarbons				
>C10-C21 Hydrocarbons	mg/kg	19000	15	746365
>C21-<C32 Hydrocarbons	mg/kg	26000	15	746365
Modified TPH (Tier1)	mg/kg	46000	20	747726
Volatile Hydrocarbons				
Benzene	mg/kg	ND	0.03	746359
Toluene	mg/kg	0.62	0.03	746359
Ethylbenzene	mg/kg	1.1	0.03	746359
Xylene (Total)	mg/kg	6.6	0.05	746359
C6 - C10 (less BTEX)	mg/kg	190	3	746359
Surrogate Recovery (%)				
Isobutylbenzene - Extractable	%	!!15		746365
n-Dotriacontane - Extractable	%	71		746365
Isobutylbenzene - Volatile	%	!!51		746359

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

Maxxam Analytics Inc

MGI Limited
466 Hodgson Rd
Fredericton, NB
E3C 2G5

Attention: Heather MacDonald

Report Date: 2005/06/03

Your P.O. #: 40338B
Your Project #: 40338B
Your C.O.C. #: 320691

ANALYTICAL REPORT

MAXXAM JOB #: A545809
Received: 2005/05/27, 09:04

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI)(1)	7	2005/05/31	2005/05/31	SOP 9775	Based on Atl. PIRI
Moisture	7	N/A	2005/05/31	SOP 9740	MOE Handbook 1983
VPH in Soil (PIRI)(1)	7	2005/05/31	2005/05/31	SOP 9785	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil(1)	1	2005/05/30	N/A		Based on Atl. PIRI
ModTPH (T1) Calc. for Soil(1)	6	2005/05/30	2005/06/03		Based on Atl. PIRI

(1) SCC/CAEAL

MAXXAM ANALYTICS INC.

ROB WHELAN

RWH/rwh
encl.

Total cover pages: 1

Maxxam Analytics Inc

Maxxam Job #: A545809
Report Date: 2005/06/03

MGI Limited
Client Project #: 40338B
Project name:
Your P.O. #: 40338B
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G28639	G28639	G28644		G28645		
Sampling Date		2005/05/24	2005/05/24	2005/05/24		2005/05/24		
COC Number		320691	320691	320691		320691		
	Units	**PI-SS1**	**PI-SS1 Dup**	**PI-SS2**	**DL**	**SP-SS1**	**DL**	**QC Batch**
Physical Properties								
Moisture	%	7.0	7.0	12	1	90	1	748613
Hydrocarbons								
>C10-C21 Hydrocarbons	mg/kg	43	54	310	15	230	15	748612
>C21-<C32 Hydrocarbons	mg/kg	34	40	680	15	2000	15	748612
Modified TPH (Tier1)	mg/kg	76	94	990	20	2300	20	747726
Volatile Hydrocarbons								
Benzene	mg/kg	ND	ND	ND	0.03	ND	0.05	748601
Toluene	mg/kg	ND	ND	ND	0.03	ND	0.05	748601
Ethylbenzene	mg/kg	ND	ND	0.04	0.03	ND	0.05	748601
Xylene (Total)	mg/kg	ND	ND	0.34	0.05	ND	0.1	748601
C6 - C10 (less BTEX)	mg/kg	ND	ND	11	3	ND	5	748601
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	94	94	97		96		748612
n-Dotriacontane - Extractable	%	97	97	98		110		748612
Isobutylbenzene - Volatile	%	108	107	109		!!144		748601

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

Maxxam Analytics Inc

Maxxam Job #: A545809
Report Date: 2005/06/03

MGI Limited
Client Project #: 40338B
Project name:
Your P.O. #: 40338B
Sampler Initials: SA

ATLANTIC MUST IN SOIL - PIRI TIER I (SOIL)

Maxxam ID		G28646	G28647	G28648	G28649		
Sampling Date		2005/05/24	2005/05/24	2005/05/24	2005/05/24		
COC Number		320691	320691	320691	320691		
	Units	**SP-SS2**	**OS-SS1**	**OS-SS2**	**REMOVED-PUMP ISLAND**	**DL**	**QC Batch**
Physical Properties							
Moisture	%	12	5.0	7.8	7.8	1	748613
Hydrocarbons							
>C10-C21 Hydrocarbons	mg/kg	230	1400	730	5600	15	748612
>C21-<C32 Hydrocarbons	mg/kg	690	4900	980	1100	15	748612
Modified TPH (Tier1)	mg/kg	920	6200	1700	6700	20	747726
Volatile Hydrocarbons							
Benzene	mg/kg	ND	ND	ND	ND	0.03	748601
Toluene	mg/kg	ND	ND	ND	ND	0.03	748601
Ethylbenzene	mg/kg	0.04	ND	ND	0.45	0.03	748601
Xylene (Total)	mg/kg	ND	ND	ND	1.3	0.05	748601
C6 - C10 (less BTEX)	mg/kg	ND	ND	4.2	52	3	748601
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	95	92	96	117		748612
n-Dotriacontane - Extractable	%	95	79	118	109		748612
Isobutylbenzene - Volatile	%	107	88	103	87		748601

ND = Not detected
QC Batch = Quality Control Batch
Please check for attached comments

Maxxam Analytics Inc

Maxxam Job #: A545809
Report Date: 2005/06/03

MGI Limited
Client Project #: 40338B
Project name:
Your P.O. #: 40338B
Sampler Initials: SA

GENERAL COMMENTS

Sample G28639-01: Weathered fuel oil fraction. Lube oil range.

Sample G28644-01: Weathered fuel oil fraction. Lube oil fraction.

Sample G28645-01: VPH surrogate not within acceptance limits due to matrix/co-extractive interference. Elevated VPH DL(s) due to sample dilution.
Fuel oil range. Unidentified compound(s) in lube range.

Sample G28646-01: Weathered fuel oil fraction. Lube oil fraction.

Sample G28647-01: Weathered fuel oil fraction. Lube oil fraction.

Sample G28648-01: Weathered fuel oil fraction. Lube oil fraction.

Sample G28649-01: Weathered fuel oil fraction. Lube oil fraction.

Results relate only to the items tested.

Maxxam Analytics Inc

MGI Limited
Attention: Heather MacDonald
Client Project #: 40338B
P.O. #: 40338B
Project name:

Quality Assurance Report

Maxxam Job Number: ZA545809

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
747726 RWH	RPD	Modified TPH (Tier1)		NC		%	N/A
748601 BRD	Spiked Blank	Isobutylbenzene - Volatile	2005/05/31		105	%	60 - 140
		Benzene	2005/05/31		110	%	60 - 140
		Toluene	2005/05/31		95	%	60 - 140
		Ethylbenzene	2005/05/31		93	%	60 - 140
		Xylene (Total)	2005/05/31		95	%	60 - 140
		C6 - C10 (less BTEX)	2005/05/31		111	%	N/A
	Method Blank	Isobutylbenzene - Volatile	2005/05/31		106	%	60 - 140
		Benzene	2005/05/31	ND, DL=0.025		mg/kg	
		Toluene	2005/05/31	ND, DL=0.025		mg/kg	
		Ethylbenzene	2005/05/31	ND, DL=0.025		mg/kg	
		Xylene (Total)	2005/05/31	ND, DL=0.05		mg/kg	
		C6 - C10 (less BTEX)	2005/05/31	ND, DL=3		mg/kg	
	RPD	Benzene	2005/05/31	NC		%	50
		Toluene	2005/05/31	NC		%	50
		Ethylbenzene	2005/05/31	NC		%	50
		Xylene (Total)	2005/05/31	NC		%	50
		C6 - C10 (less BTEX)	2005/05/31	NC		%	50
748612 DDE	MATRIX SPIKE						
	[G28639-01]	Isobutylbenzene - Extractable	2005/05/31		91	%	30 - 130
		n-Dotriacontane - Extractable	2005/05/31		96	%	30 - 130
		>C10-C21 Hydrocarbons	2005/05/31		93	%	30 - 130
		>C21-<C32 Hydrocarbons	2005/05/31		89	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2005/05/31		90	%	30 - 130
		n-Dotriacontane - Extractable	2005/05/31		92	%	30 - 130
		>C10-C21 Hydrocarbons	2005/05/31		92	%	30 - 130
		>C21-<C32 Hydrocarbons	2005/05/31		92	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2005/05/31		92	%	30 - 130
		n-Dotriacontane - Extractable	2005/05/31		93	%	30 - 130
		>C10-C21 Hydrocarbons	2005/05/31	ND, DL=15		mg/kg	
		>C21-<C32 Hydrocarbons	2005/05/31	ND, DL=15		mg/kg	
	RPD	>C10-C21 Hydrocarbons	2005/05/31	NC		%	50
		>C21-<C32 Hydrocarbons	2005/05/31	NC		%	50
748613 GMA	RPD	Moisture	2005/05/31	0		%	N/A

ND = Not detected
N/A = Not Applicable
NC = Non-calculable
RPD = Relative Percent Difference
SPIKE = Fortified sample

St. John's: 49-55 Elizabeth Avenue, Suite 101A, St. John's NL A1A 1W9 709-754-0203 Fax 709-754-8612

GDH Environmental Inc
P O Box 62
Pasadena, NL A0L 1K0

200

06/30/2005

Spring Hill Construction
Box 2100
Fredericton, NB E3B 4Y6

Spring Hill Construction
Box 2100
Fredericton, NB E3B 4Y6

521.8	tonnes	Contaminated Soil	H	35.00	18,263.00
		H - HST 15%			
		HST			2,739.45

July 11/05.
03. NFLD Costs
7340

GDH Environmental Inc HST: #890731821RP0001

Diesel Fuel 21,002.45

POSTED
JUL 20 2005

GDH ENVIRONMENTAL

DATE	INV#	TRUCK#	GROSS	TARE	NET TOTAL	
May 24, 2005	1701	CMP 500	22.60	10.80	11.80	
May 24, 2005	1702	CMP 497	25.90	11.00	14.90	
May 24, 2005	1703	CMP 497	28.40	11.00	17.40	
May 24, 2005	1704	CMP 500	25.20	10.80	14.40	
May 24, 2005	1705	CMP 500	24.00	10.80	13.20	
May 24, 2005	1706	CMP 497	25.30	11.00	14.30	
May 24, 2005	1707	CHX 824	26.10	11.30	14.80	
May 24, 2005	1708	CJP 764	25.40	11.10	14.30	
May 24, 2005	1710	CMP 500	24.30	10.80	13.50	
May 24, 2005	1711	CMP 497	23.50	11.00	12.50	
May 24, 2005	1712	CHX 824	24.20	11.30	12.90	
May 24, 2005	1713	CJP 764	24.00	11.10	12.90	
May 24, 2005	1714	CMP 497	23.80	11.00	12.80	
May 24, 2005	1715	CMP 500	24.40	10.80	13.60	
May 24, 2005	1716	CHX 824	25.00	11.30	13.70	207.02
May 24, 2005	1717	CJP 764	23.70	11.10	12.60	
May 24, 2005	1718	CMP 497	24.40	11.00	13.40	
May 24, 2005	1719	CMP 500	21.20	10.80	10.40	
May 24, 2005	1720	CHX 824	20.10	11.30	8.80	
May 24, 2005	1721	CLP 764	22.90	11.10	11.80	
May 24, 2005	1722	CMP 500	22.20	10.80	11.40	
May 24, 2005	1723	CHX 824	23.50	11.30	12.20	
May 24, 2005	1724	CJP 764	26.10	11.10	15.00	
May 24, 2005	1725	CMP 500	21.90	10.80	11.10	
May 24, 2005	1651	CHX 824	25.90	11.30	14.60	
May 24, 2005	1652	CJP 764	21.20	11.10	10.10	
May 25, 2005	1653	CJP 764	23.60	11.20	12.40	
May 25, 2005	1654	CKB 721	19.30	10.90	8.40	
May 25, 2005	1655	CHX 824	21.20	11.30	9.90	
May 25, 2005	1657	CMP 500	24.90	11.00	13.90	383.02
May 25, 2005	1659	CJP 764	23.60	11.10	12.50	
May 25, 2005	1660	CKB 721	23.90	10.90	13.00	
June 21/05	1594	CMP 497	22.60	11.00	11.60	
June 21/05	1595	CGN 230	21.50	11.10	10.40	
June 21/05	1596	CMP 500	22.40	11.10	11.30	
June 21/05	1597	CGN 230	23.40	11.10	12.30	
June 21/05	1598	CMP 500	19.90	11.10	8.80	
June 21/05	1599	CMP 497	23.00	11.00	12.00	
June 21/05	1600	CGN 230	23.80	11.10	12.70	
June 21/05	1601	CMP 500	20.20	11.10	9.10	
June 21/05	1602	CMP 497	23.80	11.00	12.80	
June 21/05	1603	CGN 230	23.40	11.10	12.30	
					521.80	ok

GDH.ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1602

Date	Time
21/6/05	

Transporter: Wilan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CMP 497

Origin of Soil: Western Const Barchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const.

Manager / Supervisor: Jeff Colter

Gross Wt. 23800

Tare Wt. 11000

Net Wt. 12800

GDH Rep.	Driver
Merle	

GDH.ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1603

Date	Time
21/6/05	1505

Transporter: Wilan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CGN 230

Origin of Soil: Western Const. Barchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const

Manager / Supervisor: Jeff Colter

Gross Wt. 23400

Tare Wt. 11100

Net Wt. 12300

GDH Rep.	Driver
Mer.	

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1598

Date	Time
21/6/05	1385

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CMP500

Origin of Soil: Western Const. Birchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const.

Manager / Supervisor: Jeff Colter

Gross Wt. 19900

Tare Wt. 11100

Net Wt. 8800

GDH Rep. | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1599

Date	Time
21/6/05	1338

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CMP497

Origin of Soil: Western Const. Birchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const.

Manager / Supervisor: Jeff Colter

Gross Wt. 23000

Tare Wt. 11000

Net Wt. 12000

GDH Rep. | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1600

Date	Time
21/6/05	1420

Transporter: Whelan Enterprise

Contractor: Spring Hill const.

Truck Licence: CEN230

Origin of Soil: Western Const. Birchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const

Manager / Supervisor: Jeff Colter

Gross Wt. 23800

Tare Wt. 11100

Net Wt. 12700

GDH Rep. | Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1601

Date	Time
21/6/05	1432

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CMP500

Origin of Soil: Western Const. Birchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const

Manager / Supervisor: Jeff Colter

Gross Wt. 20700

Tare Wt. 11100

Net Wt. 9100

GDH Rep. | Driver

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1594

Date	Time
21/6/05	1238

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CMP497

Origin of Soil: Western Construction Barchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const

Manager / Supervisor: Jeoff Colter

Gross Wt. 22600

Tare Wt. 11000

Net Wt. 11600

GDH Rep. | Driver

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1595

Date	Time
21/6/05	1240

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CLN 230

Origin of Soil: Western Construction Barchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const.

Manager / Supervisor: Jeoff Colter

Gross Wt. 21500

Tare Wt. 11100

Net Wt. 10400

GDH Rep. | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1596

Date	Time
21/6/05	1243

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CMP500

Origin of Soil: Western Construction Barchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const.

Manager / Supervisor: Jeoff Colter

Gross Wt. 22400

Tare Wt. 11100

Net Wt. 11300

GDH Rep. | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1597

Date	Time
21/6/05	1331

Transporter: Whelan Enterprise

Contractor: Spring Hill Const.

Truck Licence: CGN 230

Origin of Soil: Western Construction Barchois Brook

Contaminant / Soil Condition: Diesel Fuel

Owner: Spring Hill Const

Manager / Supervisor: Jeoff Colter

Gross Wt. 23400

Tare Wt. 11100

Net Wt. 12300

GDH Rep. | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1655

Date	Time
25 May 05	0740

Transporter: Whelan enterprise

Contractor: Spring hill construction

Truck Licence: CHX 824

Origin of Soil: Western construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 21700

Tare Wt. 11300

Net Wt. 9900

GDH Rep.	Driver
Mokeele	

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1659

Date	Time
25 May 05	0874

Transporter: Whelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CJP 764

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 23600

Tare Wt. 11100

Net Wt. 12500

GDH Rep.	Driver
Mokeele	

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1657

Date	Time
25 May 05	0754

Transporter: Whelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CMP500

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 24900

Tare Wt. 11000

Net Wt. 13900

GDH Rep.	Driver
Mokeele	

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1660

Date	Time
25 May 05	0828

Transporter: Whelan Enterprize

Contractor: Spring Hill longstruction

Truck Licence: CKB 721

Origin of Soil: Western construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 23900

Tare Wt. 10900

Net Wt. 13000

GDH Rep.	Driver
Mokeele	

21▮ Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1651

Date	Time
24 May 05	1710

Transporter: Whelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CHX 874

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 25900

Tare Wt. 11300

Net Wt. 14600

GDH Rep.	Driver
[signature]	[signature]

A2N 3M2
Tel: (709) 643-9090

1652

Date	Time
24 May 05	1722

Transporter: Whelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CJP 764

Origin of Soil: Western Contractors St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 21200

Tare Wt. 11100

Net Wt. 10100

GDH Rep.	Driver
[signature]	[signature]

---

216 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1653

Date	Time
25 May 05	0730

Transporter: Whelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CJP 764

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 23600

Tare Wt. 11200

Net Wt. 12400

GDH Rep.	Driver
[signature]	[signature]

---

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1654

Date	Time
25 May 05	0736

Transporter: Whelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CKB 721

Origin of Soil: Western construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 19300

Tare Wt. ~~21700~~ 10900

Net Wt. 8400

GDH Rep.	Driver
[signature]	[signature]

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1722

Date	Time
24 May 05	1530

Transporter: Wheelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CMP500

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fuel

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 22700

Tare Wt. 10800

Net Wt. 11460

GDH Rep.	Driver
[signature]	[signature]

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1723

Date	Time
24 May 05	1540

Transporter: Wheelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CMX 824

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fuel

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 23500

Tare Wt. 11300

Net Wt. 12200

GDH Rep.	Driver
[signature]	[signature]

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1724

Date	Time
24 May 05	1555

Transporter: Wheelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CJP 764

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fule

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 26100

Tare Wt. 11100

Net Wt. 15000

GDH Rep	Driver
[signature]	[signature]

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1725

Date	Time
24 May 05	1700

Transporter: Wheelan Enterprise

Contractor: Spring Hill Construction

Truck Licence: CMP500

Origin of Soil: Western Construction St. Georges

Contaminant / Soil Condition: Diesel Fuel

Owner:

Manager / Supervisor: Geoff Colten

Gross Wt. 21900

Tare Wt. 10800

Net Wt. 11100

GDH Rep.	Driver
[signature]	[signature]

Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1718

Date	Time
24 May 05	1123

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CHP497
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colton

Gross Wt. 24400
Tare Wt. 11 000
Net Wt. 13,400

GDH Rep. MMcKeefe
Driver

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1719

Date	Time
24 May 05	1438

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: 3 CMP 500
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 21200
Tare Wt. 10800
Net Wt. 10400

GDH Rep. MMcKeefe
Driver Kim

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1720

Date	Time
24 May 05	1443

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CHX824
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 20100
Tare Wt. 11300
Net Wt. 8800

GDH Rep. MMcKeefe
Driver

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1721

Date	Time
24 May 05	1500

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CJP 764
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 22900
Tare Wt. 11100
Net Wt. 11800

GDH Rep. MMcKeefe
Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1714

Date	Time
24 May 05	1327

Transporter: Whelan Enterprise
Contractor: Spring Hill Contruction
Truck Licence: CMP497
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 23800
Tare Wt. 11000
Net Wt. 12800

GDH Rep. McKeefe | Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1715

Date	Time
24 May 05	1340

Transporter: Whelan Enterprises
Contractor: Spring Hill Construction
Truck Licence: CMP500
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 24400
Tare Wt. 10800
Net Wt. 13600

GDH Rep. McKeefe | Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1716

Date	Time
24 May 05	1350

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CHX 824
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 25000
Tare Wt. 11300
Net Wt. 13700

GDH Rep. McKeefe | Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1717

Date	Time
24 May 05	11111

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CJP 764
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colten

Gross Wt. 23700
Tare Wt. 11100
Net Wt. 12600

GDH Rep. McKeefe | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1710

Date	Time
24 May 05	1207

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CMP500
Origin of Soil: Western construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 24300
Tare Wt. 10800
Net Wt. 13500

GDH Rep. MOKeefe | Driver

Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1711

Date	Time
24 May 05	1215

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CHP497
Origin of Soil: Western construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 23500
Tare Wt. 11000
Net Wt. 12500

GDH Rep. MOKeefe | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1712

Date	Time
24 May 05	1224

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CHX 824
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 24200
Tare Wt. 11300
Net Wt. 12900

GDH Rep. MOKeefe | Driver

215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1713

Date	Time
24 May 05	1318

Transporter: Whelan Enterprise
Contractor: Spring Hill Construction
Truck Licence: CJP764
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fuel
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 24080
Tare Wt. 11100
Net Wt. 12980

GDH Rep. MOKeefe | Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1705

Date	Time
21 May 05	1107
Transporter: Whelan Enterprises	
Contractor: Spring Hill construction	
Truck Licence: CMP500	
Origin of Soil: Western construction St. Georges	
Contaminant / Soil Condition: Diesel Fuel	
Owner:	
Manager / Supervisor: Geoff Colter	

Gross Wt. 24000
Tare Wt. 10800
Net Wt. 13,200

GDH Rep.	Driver
MBKeele	

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1706

Date	Time
24 May 05	1110
Transporter: Whelan Enterprises	
Contractor: Spring Hill construction	
Truck Licence: CHP497	
Origin of Soil: Western Contractors St. Georges	
Contaminant / Soil Condition: Diesel Fuel	
Owner:	
Manager / Supervisor: Geoff Colter	

Gross Wt. 25300
Tare Wt. 11000
Net Wt. 14 300

GDH Rep.	Driver
MBKeele	

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1707

Date	Time
24 May 05	1130
Transporter: Whelan Enterprises	
Contractor: Spring Hill Construction	
Truck Licence: CHY 824	
Origin of Soil: Western Contractors St. Georges	
Contaminant / Soil Condition: Diesel Fuel	
Owner:	
Manager / Supervisor: Geoff Colter	

Gross Wt. 26100
Tare Wt. 11300
Net Wt. 14800

GDH Rep.	Driver
MBKeele	

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1708

Date	Time
24 May	1705
Transporter: Whelan Enterprises	
Contractor: Spring Hill Construction	
Truck Licence: CJP 764	
Origin of Soil: Western Construction St. Georges	
Contaminant / Soil Condition: Diesel Fuel	
Owner:	
Manager / Supervisor: Geoff Colter	

Gross Wt. 25400
Tare Wt. 11100
Net Wt. 14300

GDH Rep.	Driver
MBKeele	

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1702

Date	Time
24 May 05	1008

Transporter: Whelan Enterprizes
Contractor: Spring Hill construction
Truck Licence: CHP 497
Origin of Soil: Western construction St. Georges
Contaminant / Soil Condition: Diesel Fule
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 25900
Tare Wt. 11020
Net Wt. 14900

GDH Rep. Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1701

Date	Time
24 May 05	1000

Transporter: Whelan Enterprizes
Contractor: Spring Hill construction
Truck Licence: CMP500
Origin of Soil: Western Construction - St. Georges
Contaminant / Soil Condition: Diesel Fule
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 22600
Tare Wt. 10800
Net Wt. 11800

GDH Rep. Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1703

Date	Time
24 May 05	0855

Transporter: Whelan Enterprizes
Contractor: Spring Hill Construction
Truck Licence: CHP497
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fule
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 75400
Tare Wt. 11600
Net Wt. 63800

GDH Rep. Driver

GDH ENVIRONMENTAL INC.
215 Carolina Ave., Hanger 213
Stephenville, NF
A2N 3M2
Tel: (709) 643-9090

1704

Date	Time
24 May 05	0905

Transporter: Whelan Enterprizes
Contractor: Spring Hill Construction
Truck Licence: CMP500
Origin of Soil: Western Construction St. Georges
Contaminant / Soil Condition: Diesel Fule
Owner:
Manager / Supervisor: Geoff Colter

Gross Wt. 25200
Tare Wt. 10800
Net Wt. 14400

GDH Rep. Driver

APPENDIX E
RECORD OF SITE CONDITION

Part 1 of 7: Source Property Information

Civic Address: Route 461 & Carter's Road, Barachois Brook, NL
Former Western Construction Company

Person Responsible (name and address): FULCO, PO Box 2100, Fredericton, NB E3B 4Y6
Attention: Geoff Colter

GSC / Provincial File Number:

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
None		

- **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
Phase I and Limited Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NL	March 5, 2001
Additional Phase II Environmental Site Assessment, Western Construction Company Limited, Barachois Brook, NL	August 15, 2001
Phase III Environmental Site Assessment, Risk Assessment, Remedial Action Plan, Western Construction Company Limited, Barachois Brook, NL	November 2, 2004
Remedial Action Plan Implementation Report, Western Construction Company Limited, Barachois Brook, NL	September 30, 2005

Part 3 of 7: Remedial Action

- List the Chemicals of Concern (COC) identified on or originating from the source property:

  See attached list of COC (Tables 4 & 5 from Phase III ESA/Risk Assessment/Remedial Action Plan Report dated November 2, 2004)

- Describe the elements of the Remedial Action Plan(s) with time periods, employed for the site:

  Soil excavation with off-site treatment between May 24 and July 18, 2005

- Was a risk assessment completed as part of the Remedial Action Plan? ✓ Yes ____ No

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

Risk Assessment Methodology Used		CCME		Atlantic RBCA Tier II & III	
Media	**(units)**	Lead	Nickel	Benzene	TPH
Soil	mg/kg	1,480	7,159	See attached Table 11 from Phase III ESA/Risk Assessment/Remedial Action Plan Report dated November 2, 2004. Confirmation indoor air sampling completed in the Repair Shop and Bunkhouse confirmed no unacceptable human health risk.	
Groundwater	mg/L	Not calculated			

If no, list the selected Tier I criteria: (expand the table as required)

Media	
Soil (mg/kg)	Tier I criteria used are listed in the attached Table 11 from Phase III ESA/Risk Assessment/Remedial Action Plan Report dated November 2, 2004 except for lead, nickel, benzene and TPH that were assessed at Tier II as noted above
GW (mg/L)	

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

Consultant Name:

Consultant Address:

Date & Title of Risk Assessment/Closure 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) were identified by the Person Responsible, 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 the corrective action taken: (expand the table as required)

Civic Address	Type of Impact	Corrective Action
None		

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

Comments (special considerations, site management issues, etc.):

Site management Issues:

1. Two areas identified on the attached Figure 3 from the Remedial Action Plan Implementation report dated September 30, 2005 are designated as not suitable for construction of human occupied buildings due to potential indoor air concentrations of petroleum hydrocarbons. Additional risk assessment and possibly corrective action would be required prior to this type of construction in these two areas which are near the pump island and the former settling pond.
2. Natural biodegradation of petroleum hydrocarbons in the Marsh Area is the approved remedial method and is anticipated to require approximately 10 years to be achieved. No human intervention activity is required to achieve this.
3. Asbestos insulation on the boiler is to be maintained such that asbestos fibres do not become airborne. Continued use of the asbestos insulation is acceptable.
4. Lead-based paint on the Carpenter Shop should be maintained in good condition. Any paint removed or collected due to flaking or maintenance from the door and trim should be collected and disposed as hazardous waste. Appropriate Personal Protection Equipment should be worn by persons doing paint maintenance on the door and trim of the Carpenter Shop.

Part 6 of 7: Summary Statement of Site Professional

The Minister considers the pre-checked statements 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:

✓ This Record of Site Condition form is identical to the one provided in the Province of Newfoundland & Labrador Guidance Document for the Management of Impacted Sites and the content of the form has not been altered.

✓ All work on which this Record of Site Condition is based was prepared, overseen and/or reviewed by the Site Professional.

✓ The site was managed in accordance with the current version of the Province of Newfoundland & Labrador Guidance Document for the Management of Impacted Sites.

✓ 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.

✓ A site plan with scale indicated, identifying the referenced properties is attached to this Record of Site Condition.

✓ 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.

— The Remedial Action Plan, Risk Assessment or Closure Report was peer reviewed by a qualified, independent Site Professional.

— If peer reviewed, the results of the Peer Review were appropriately incorporated into the final Remedial Action Plan and/or Closure Report.

— 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.

— 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.

✓ The source property has been remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.

✓ The source property requires on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.

— 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.

— 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.

— With respect to notification, the requirements of section 8(d) of the *Environmental Protection Act* have been fulfilled.

✓ The source property is recommended for **Conditional Closure** and is subject to monitoring requirements specified in documents listed in Part 2.

— The source property is recommended for **Final Closure**

Signature _____

Neil Brodie
Professional Affiliation: APEGNL

Date: September 30, 20 05
Membership No. 03779

Company: MGI Limited
Address: 466 Hodgson Road
Fredericton, NB
E3C 2G5

Tel. (506) 458-1248

Part 7 of 7: Acknowledgement of Receipt by Newfoundland and Labrador Department of Environment and Conservation

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 current version of the Newfoundland and Labrador Department of Environment and Conservation *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 current version of the Newfoundland and Labrador Department of Environment and Conservation *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 current version of the Newfoundland and Labrador Department of Environment and Conservation *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 Environment and Conservation Date

TABLE 4: HUMAN HEALTH SCREENING CRITERIA
COMMERCIAL LAND USE RECEPTOR
COARSE-GRAINED SOIL

CHEMICAL	SCREENING CRITERIA		SCREENING SOURCE	
	SOIL & SEDIMENT (mg/kg) Based on Non-potable Groundwater	GROUNDWATER (mg/L) Based on Potable Groundwater	SOIL & SEDIMENT	GROUND WATER
METALS (mg/kg)				
Aluminum	78,000	--	3	--
Antimony	40	0.006	1	5
Arsenic	12	0.025	1	5
Barium	2,000	1.0	1	5
Beryllium	8	--	1	--
Bismuth	NOT SCREENED			
Boron	7,000	5	3	5
Cadmium	49	0.005	1	5
Calcium	NOT SCREENED			
Chromium (total))	630	0.05	1	5
Cobalt	300	--	1	--
Copper	4000	1.0	1	5
Iron	NOT SCREENED			
Lead	260	0.010	1	5
Lithium	1,600	--	3	--
Manganese	NOT SCREENED			
Mercury	24	0.001	1	5
Molybdenum	40	--	1	--
Nickel	50	--	1	--
Potassium	NOT SCREENED			
Rubidium	NOT SCREENED			
Selenium	100	0.010	1	5
Silver	40	--	1	--
Sodium	NOT SCREENED			
Strontium	47,000	--	3	--
Tellurium	NOT SCREENED			
Sulphur	NOT SCREENED			
Thallium	1	--	1	--
Tin	300	--	1	--
Uranium	230	--	3	--
Vanadium	470	--	2	--
Zinc	1,000	5.0	2	5
PAH (mg/kg)				
Naphthalene	120	--	2	--
Acenaphthylene	100	--	2	--
Acenaphthene	1,000	--	2	--
Fluorene	910	--	2	--
Phenanthrene	50	--	1	--
Anthracene	1,000	--	2	--
Fluoranthene	910	--	2	--
Pyrene	100	--	1	--
Benzo(a)anthracene	10	--	1	--
Chrysene	12	--	2	--
Benzo(b+k)fluoranthene	10	--	1	--
Benzo(e)pyrene	NOT SCREENED			
Benzo(a)pyrene B(a)P}	0.7	0.00001	1	5
Indeno(1,2,3-cd)pyrene	10		1	--
Benzo(g,h,i)perylene	120		2	--

TABLE 4: Continued

CHEMICAL	SCREENING CRITERIA		SCREENING SOURCE	
	SOIL & SEDIMENT (mg/kg) Based on Non-potable Groundwater	GROUNDWATER (mg/L) Based on Potable Groundwater	SOIL & SEDIMENT	GROUND WATER
PAH (mg/kg) - Continued				
Dibenz(a,h)anthracene	10		1	--
Perylene	NOT SCREENED			
1-methylnaphthalene + 2-methylnaphthalene	280		2	--
1-chloronaphthalene	NOT SCREENED			
2-chloronaphthalene	NOT SCREENED			
PETROLEUM HYDROCARBONS				
Benzene	1.8	0.005	4	4
Toluene	160	0.024	4	4
Ethylbenzene	430	0.0024	4	4
Xylenes	200	0.3	4	4
Total Petroleum Hydrocarbons (TPH from C6-C32)	450 if gas	19 if gas	4	4
	7,400 if #2 Oil	15 if #2 Oil		
	10,000 if #6 Oil	20 if #6 Oil		
POLYCHLORINATED BIPHENYLS (PCB)				
PCB	33		1	

Sequence of Human Health Screening Criteria selection:

1	CCME Canadian Environmental Quality Guidelines, Update 3.2, December 2003.
2	Ontario MOEE Rationale for the Development and Application of Generic Soil, Groundwater and Sediment Criteria for use at Contaminated Sites in Ontario, May 1996. Table B – Soil Remediation Criteria, Residential/Parkland, Surface/Full Depth, Non-Potable Groundwater, Coarse textured soils. Lowest exposure pathway criteria were selected.
3	USEPA Region III Risk-Based Concentration Tables (Residential receptor) April 2004
4	Atlantic PIRI Tier I Tables (Version 2) Commercial, coarse grained soils was used exclusively for BTEX/TPH (toddler receptor) – Non-Potable for soil; Potable for Groundwater
5	Canadian Drinking Water Quality Guidelines, April 2004

TABLE 5: ECOLOGICAL HEALTH SCREENING CRITERIA
FRESHWATER AQUATIC RECEPTOR, COMMERCIAL LAND USE

CHEMICAL	SCREENING CRITERIA (Screening Source)			
	SOIL (mg/kg)	GROUNDWATER (mg/L)	SEDIMENT (CEQG - PEL) (mg/kg)	SURFACE WATER (mg/L)
METALS (mg/kg)				
Aluminum	NOT SCREENED			
Antimony	40 (1)	---		
Arsenic	26 (1)	0.005 (1)	17 (1)	0.005 (1)
Barium	2,000 (1)	23 (2)		
Beryllium	8 (1)	0.053 (2)		
Bismuth	NOT SCREENED			
Boron	2.0 (2)	50 (2)		
Cadmium	22 (1)	0.000017 (1)	3.5 (1)	0.000017 (1)
Calcium	NOT SCREENED			
Chromium (total))	87 (1)	0.0089 (1)	90 (1)	0.0089 (1)
Cobalt	300 (1)	0.100 (2)		
Copper	91 (1)	0.002 (1)	197 (1)	0.002 (1)
Iron	NOT SCREENED			
Lead	600 (1)	0.001 (1)	91.3 (1)	0.001 (1)
Lithium	NOT SCREENED			
Manganese	NOT SCREENED			
Mercury	50 (1)	0.000026 (1)	0.486 (1)	0.000026 (1)
Molybdenum	40 (1)	0.073 (1)		0.073 (1)
Nickel	50 (1)	0.025 (1)		0.025 (1)
Potassium	NOT SCREENED			
Rubidium	NOT SCREENED			
Selenium	3.9 (1)	0.001 (1)		0.001 (1)
Silver	40 (1)	0.0001 (1)		0.0001 (1)
Sodium	NOT SCREENED			
Strontium	NOT SCREENED			
Tellurium	NOT SCREENED			
Sulphur	NOT SCREENED			
Thallium	3.6 (1)	0.0008 (1)		0.0008 (1)
Tin	300 (1)	---		
Uranium	NOT SCREENED			
Vanadium	130 (1)	---		
Zinc	320 (1)	---	315 (1)	0.03 (1)
PAH (mg/kg)				
Naphthalene	22 (1)	0.0011 (1)	0.391 (1)	0.0011 (1)
Acenaphthylene	NOT SCREENED		0.128 (1)	
Acenaphthene	---	0.0058 (1)	0.089 (1)	0.0058 (1)
Fluorene	---	0.003 (1)	0.144 (1)	0.003 (1)
Phenanthrene	50 (1)	0.0004 (1)	0.515 (1)	0.0004 (1)
Anthracene	---	0.000012 (1)	0.245 (1)	0.000012 (1)
Fluoranthene	40 (2)	0.00004 (1)	2.355 (1)	0.00004 (1)
Pyrene	100 (1)	0.000025 (1)	0.875 (1)	0.000025 (1)
Benzo(a)anthracene	10 (1)	0.000018 (1)	0.385 (1)	0.000018 (1)
Chrysene	NOT SCREENED		0.862 (1)	
Benzo(b+k)fluoranthene	10 (1)	0.0004 (2)		
Benzo(e)pyrene	NOT SCREENED			
Benzo(a)pyrene B(a)P	1.4 (1)	0.000015 (1)	0.782 (1)	0.000015 (1)
Indeno(1,2,3-cd)pyrene	10 (1)	0.00027 (2)		
Benzo(g,h,i)perylene	40 (2)	0.0002 (2)		
Dibenz(a,h)anthracene	10 (1)	0.00025 (2)	0.135 (1)	
Perylene	NOT SCREENED			
1-methylnaphthalene + 2-methylnaphthalene	NOT SCREENED		0.201 (1)	
1-chloronaphthalene	NOT SCREENED			
2-chloronaphthalene	NOT SCREENED			

TABLE 5: Continued

CHEMICAL	SCREENING CRITERIA (Screening Source)			
	SOIL (mg/kg)	GROUNDWATER (mg/L)	SEDIMENT (CEQG - PEL) (mg/kg)	SURFACE WATER (mg/L)
PETROLEUM HYDROCARBONS				
Benzene	39 (1)	0.370 (1)	39 (1) Comm Soil	0.370 (1)
Toluene	10 (1)	0.002 (1)	10 (1) Comm Soil	0.002 (1)
Ethylbenzene	20 (1)	0.090 (1)	20 (1) Comm Soil	0.090 (1)
Xylenes	21 (1)	---	21 (1) Comm Soil	
TPH C6-C10 (F1)	330 / 700 (3) Note 1	1.5 (4) Note 2	660 (3) Comm Soil	0.15 (5)
TPH C10-C19 (F2)	760 / 2000 (3) Note 1	0.5 (4) Note 2	1500 (3) Comm Soil	0.05 (5)
TPH C19-C32 (F3)	1700 / 3500 Note 1	Not applicable	2500 (3) Comm Soil	
Total Petroleum Hydrocarbons (TPH)	NOT SCREENED			
POLYCHLORINATED BIPHENYLS (PCB)				
PCB			0.277 (1)	

Note 1: Eco Soil Contact, two depths, since no nearby groundwater discharge to watercourses. 0 to 1.0 metres / > 1.5 metres depth

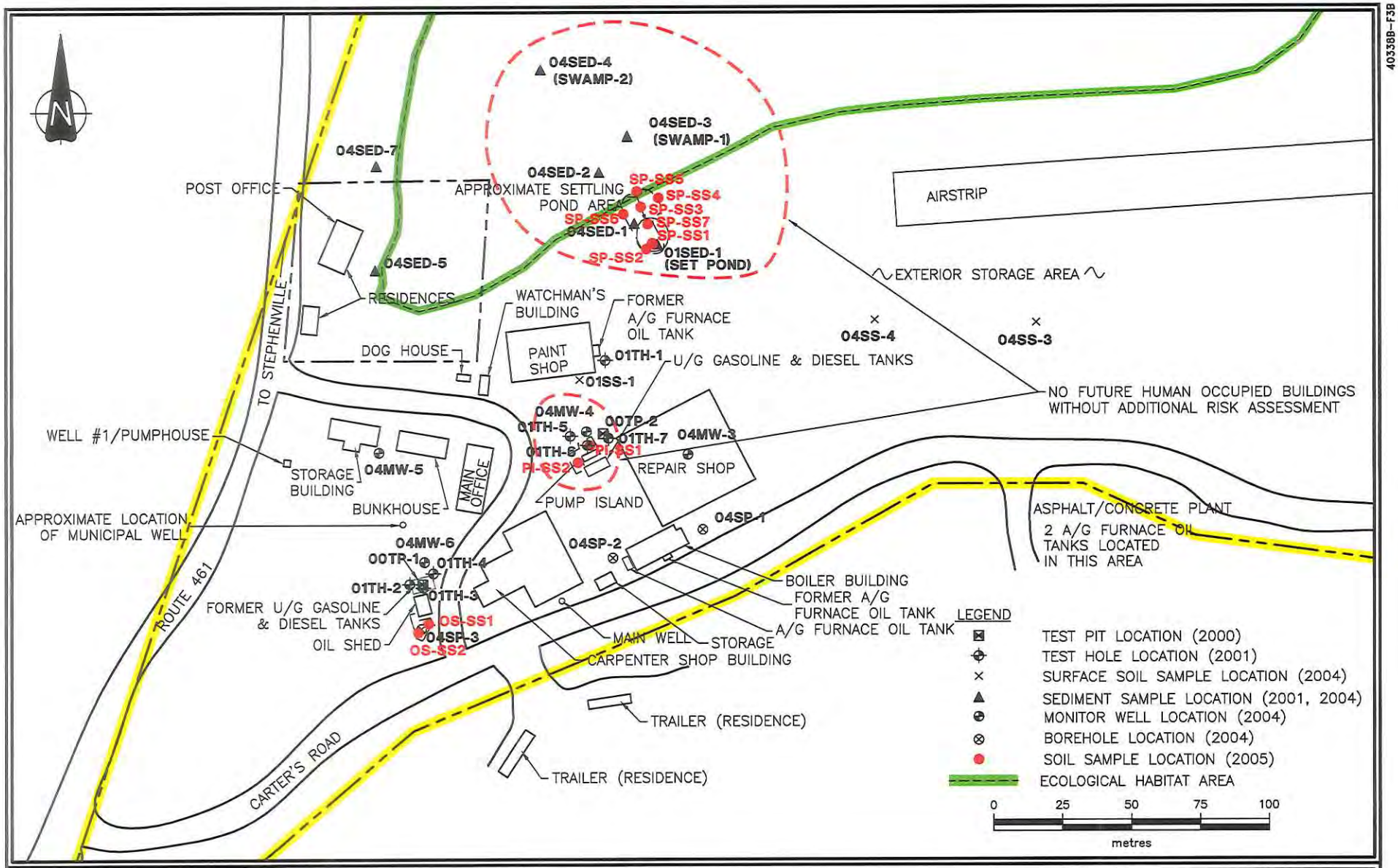
Note 2: Assumes 10 x dilution between monitor well and receiving water.

Sequence of Ecological Health Screening Criteria selection:

1	CCME Canadian Environmental Quality Guidelines, Update 3.2, December 2003
2	Ontario MOEE Guideline for Use at Contaminated Sites in Ontario, February 1997 and OMOEE Rationale for the Development and Application of Generic Soil, Groundwater and Sediment Criteria for use at Contaminated Sites in Ontario, May 1996. Table B – Soil Remediation Criteria, Industrial/Commercial, Surface/Full Depth, Non-Potable Groundwater, and Coarse textured soils.
3	CCME Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil, Technical Supplement, January 2001.
4	British Columbia Contaminated Sites Regulation #375, 1997.

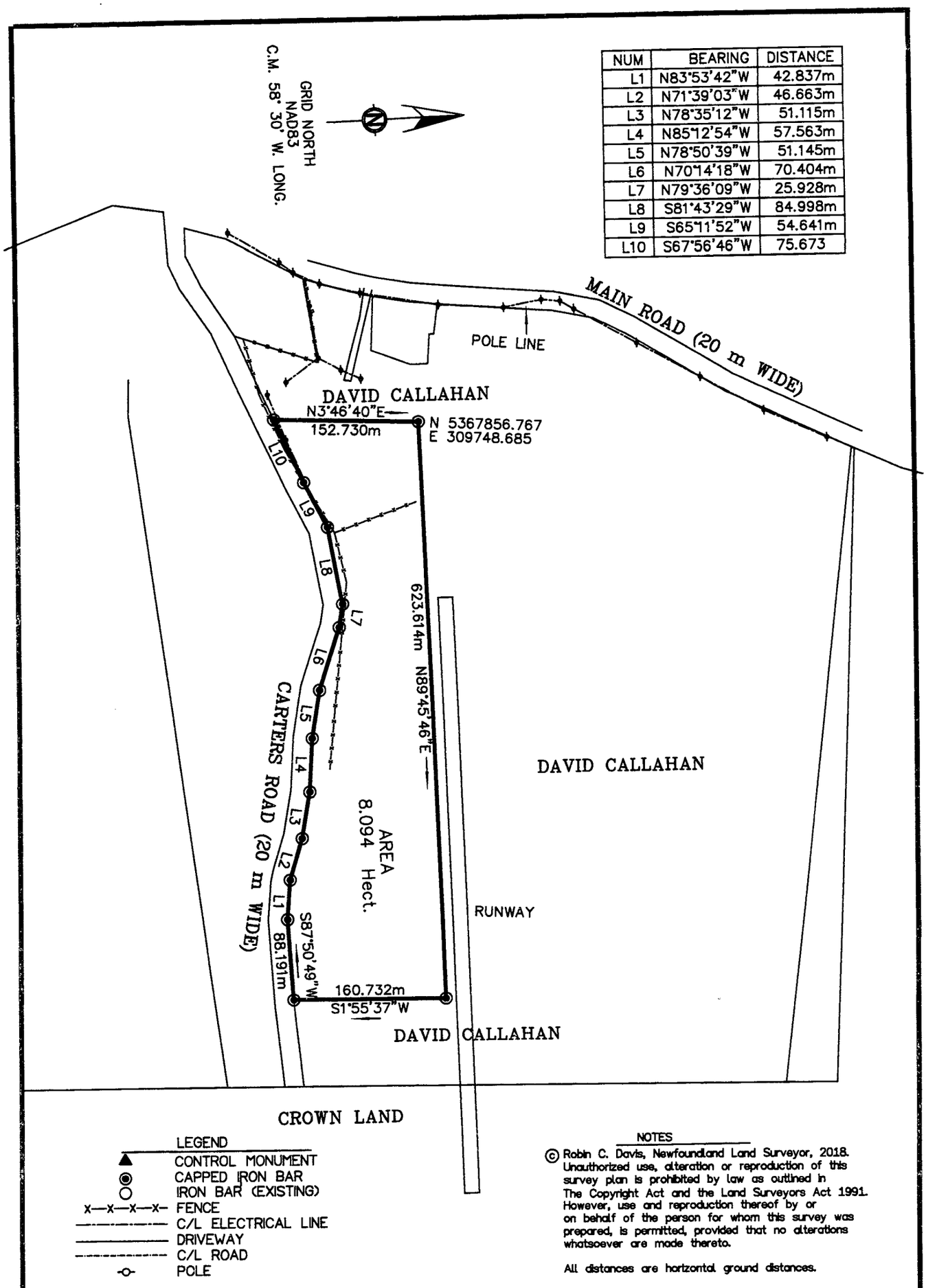
TABLE 11: SUMMARY OF ATLANTIC RBCA MODEL RUNS
WESTERN CONSTRUCTION SITE – BARACHOIS BROOK, NL

	Run 1	Run 2	Run 3	Run 3A	Run 4	Run 5
Location	Pump Island & Repair Shop	Paint Shop & Oil Shed	Storage Bldg & Bunkhouse	Storage Bldg & Bunkhouse	Marsh Area	Settling Pond
Land Use	Commercial	Commercial	Commercial	Residential	Residential	Commercial
Operable Exposure Pathways	Direct Soil Contact Outdoor Air Indoor Air	Direct Soil Contact Outdoor Air Indoor Air	Direct Soil Contact Outdoor Air Indoor Air	Direct Soil Contact Outdoor Air Indoor Air	Direct Soil Contact Outdoor Air	Direct Soil Contact Outdoor Air
Product Type	Gas / #2 Oil Mix	#2 Oil	Gas / #2 Oil Mix	Gas / #2 Oil Mix	#6 Oil	#2 Oil
Soil Impact Zone (metres)	4.0 – 10.0	0 – 3.0	7.6 – 10.6	7.6 – 10.6	0 – 1.0	0 – 2.0
Depth to Groundwater (metres)	9.6	11.1	11.3	11.3	9.6	9.6
Source- Soil Fractionation	04MW-4	04MW-6	04MW-4	04MW-4	#6 Oil PIRI Default	#2 Oil PIRI Default
Source-Soil Concentration	00TP-2	01TH-1	04MW-5	04MW-5	04SED-3	Default fractions
Source-GW Fractionation	04MW-4	04MW-6	04MW-4	04MW-4	#6 Oil PIRI Default	#2 Oil PIRI Default
Source-GW Concentration	04MW-4	04MW-6	04MW-5	04MW-5	Swamp-1	Default fractions
SSTLs Soil (mg/kg)						
Benzene	2.2	4.4	4.4	0.99	270	280
TPH	510	16,000	630	85	52,000	18,000
SSTLS Groundwater (mg/L)						
Benzene	8.0	8.3	8.3	1.4	>SOL	>SOL
TPH	160	1,100	280	27.0	>SOL	>SOL
Site Data Soil (mg/kg)						
Benzene	3.76 (01TH-6) nd (01TH-5) 22.8 (04MW-4) 0.83 (01TH-7) 0.289 (00TP-2)	2.57 (01TH-1) 0.289 (01TH-2) nd (01TH-3) nd (01TH-4) 0.0125 (04SP-3) 0.527 (00TP-1) nd (04MW-6)	nd (04MW-5)	nd (04MW-5)	nd (04SED-2) nd (04SED-3) nd (04SED-4) nd (04SED-5) nd (04SED-7)	nd (01SED-1) nd (04SED-1)
TPH	810 (01TH-6) 270 (01TH-5) 1,310 (04MW-4) nd (01TH-7) 2,500 (00TP-2)	8,000 (01TH-1) 1,300 (01TH-2) nd (01TH-3) 1,100 (01TH-4) 12,000 (04SP-3) 6,800 (00TP-1) 3,570 (04MW-6)	1,800 (04MW-5)	1,800 (04MW-5)	12,000 (04SED-2) 21,000 (04SED-3) 3,200 (04SED-4) 420 (04SED-5) 1,300 (04SED-7)	60,000 (01SED-1) 74,000 (04SED-1)
Site Data Groundwater (mg/L)						
Benzene	3.93 (04MW-4)	0.01 (04MW-6)	0.002 (04MW-5)	0.002 (04MW-5)	nd (Swamp-1) nd (Swamp-2)	nd (Settling Pond May 04)
TPH	6.13 (04MW-4)	2.11 (04MW-6)	0.6 (04MW-5)	0.6 (04MW-5)	0.15 (Swamp-1) nd (Swamp-2)	0.4 (Settling Pond May 04)



MGI A member of the Family of Companies	TITLE: SITE PLAN WITH SAMPLE LOCATIONS	DATE: Sept. 2005	PROJECT NO.: 40338B
	PROJECT: RAP IMPLEMENTATION WESTERN CONSTRUCTION CO. LTD. ROUTE 461, BARACHOIS BROOK, NL	SCALE: As Noted	FIGURE NO.: 3
		DRAWN: GBS	

Appendix G
Down Home Grow Information



NUM	BEARING	DISTANCE
L1	N83°53'42"W	42.837m
L2	N71°39'03"W	46.663m
L3	N78°35'12"W	51.115m
L4	N85°12'54"W	57.563m
L5	N78°50'39"W	51.145m
L6	N70°14'18"W	70.404m
L7	N79°36'09"W	25.928m
L8	S81°43'29"W	84.998m
L9	S65°11'52"W	54.641m
L10	S67°56'46"W	75.673

LEGEND

- CONTROL MONUMENT
- CAPPED IRON BAR
- IRON BAR (EXISTING)
- x—x—x—x— FENCE
- C/L ELECTRICAL LINE
- DRIVEWAY
- C/L ROAD
- POLE

NOTES

All distances are horizontal ground distances.

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LAND SURVEYED FOR
DAVID CALLAHAN
CARTERS ROAD, BARACHOIS BROOK, NL

SCALE: 1 : 5000	DWG. NO.: 17207–4
DATE: APR. 5, 2018	DRAWN BY: R.D.

Your Project #: 2-1-856
Your C.O.C. #: D39902

Attention: Jennifer Dawe

Pinchin LeBlanc Environmental
St. John's - Standing Offer
27 Austin St
2nd Floor
St. John's, NL
CANADA A1B 4C3

Report Date: 2019/03/18
Report #: R5633129
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B964993
Received: 2019/03/13, 13:45

Sample Matrix: Soil
Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
TEH in Soil (PIRI) (1, 2)	19	2019/03/14	2019/03/15	ATL SOP 00197	Atl. RBCA v3.1 m
Moisture	19	N/A	2019/03/14	ATL SOP-00196	OMOE Handbook 1983 m
ModTPH (T1) Calc. for Soil	19	N/A	2019/03/15	N/A	Atl. RBCA v3.1 m
VPH in Soil (PIRI) - Field Preserved (3)	11	N/A	2019/03/14	ATL SOP 00199	Atl. RBCA v3.1 m
VPH in Soil (PIRI) - Field Preserved (3)	8	N/A	2019/03/15	ATL SOP 00199	Atl. RBCA v3.1 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Reported on a dry weight basis.
(2) Soils are reported on a dry weight basis unless otherwise specified.
(3) No lab extraction date is given for C6-C10/BTEX and VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.

Your Project #: 2-1-856
Your C.O.C. #: D39902

Attention: Jennifer Dawe

Pinchin LeBlanc Environmental
St. John's - Standing Offer
27 Austin St
2nd Floor
St. John's, NL
CANADA A1B 4C3

Report Date: 2019/03/18
Report #: R5633129
Version: 2 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B964993
Received: 2019/03/13, 13:45

Encryption Key

Maxxam
18 Mar 2019 12:13:53

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Paula Chaplin, Project Manager Assistant
Email: PChaplin@maxxam.ca
Phone# (709)754-8615
==========

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 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JEL277	JEL278			JEL279		
Sampling Date		2019/03/11	2019/03/11			2019/03/11		
COC Number		D39902	D39902			D39902		
	UNITS	TP1,S1,0-0.6M	TP1,S7,3.6-4.2M	RDL	QC Batch	TP2,S3,1.2-1.8M	RDL	QC Batch
Inorganics								
Moisture	%	4.8	3.9	1.0	6016353	4.6	1.0	6016353
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	0.025	6015855	ND	0.025	6015855
Toluene	mg/kg	ND	ND	0.050	6015855	ND	0.050	6015855
Ethylbenzene	mg/kg	ND	ND	0.025	6015855	ND	0.025	6015855
Total Xylenes	mg/kg	ND	ND	0.050	6015855	ND	0.050	6015855
C6 - C10 (less BTEX)	mg/kg	ND	ND	2.5	6015855	7.5	2.5	6015855
>C10-C16 Hydrocarbons	mg/kg	ND	ND	10	6016466	1100	10	6016466
>C16-C21 Hydrocarbons	mg/kg	ND	ND	10	6016466	580	10	6016466
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	15	6016466	140	15	6016466
Modified TPH (Tier1)	mg/kg	ND	ND	15	6015813	1800	15	6015813
Reached Baseline at C32	mg/kg	NA	NA	N/A	6016466	Yes	N/A	6016466
Hydrocarbon Resemblance	mg/kg					COMMENT (1)	N/A	6016466
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	99	100		6016466	105		6016466
n-Dotriacontane - Extractable	%	103	105		6016466	110		6016466
Isobutylbenzene - Volatile	%	91	86		6015855	74		6015855

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Weathered fuel oil fraction.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JEL279			JEL280	JEL281	JEL282		
Sampling Date		2019/03/11			2019/03/11	2019/03/11	2019/03/11		
COC Number		D39902			D39902	D39902	D39902		
	UNITS	TP2,S3,1.2-1.8M Lab-Dup	RDL	QC Batch	TP2,S8,4.2-4.8M	TP3,S1,0-0.6M	TP3,S5,2.4-3.0M	RDL	QC Batch
Inorganics									
Moisture	%	5.0	1.0	6016353	4.0	4.6	6.2	1.0	6016353
Petroleum Hydrocarbons									
Benzene	mg/kg	ND	0.025	6015855	ND	ND	ND	0.025	6015855
Toluene	mg/kg	ND	0.050	6015855	ND	ND	ND	0.050	6015855
Ethylbenzene	mg/kg	ND	0.025	6015855	ND	ND	ND	0.025	6015855
Total Xylenes	mg/kg	ND	0.050	6015855	ND	ND	ND	0.050	6015855
C6 - C10 (less BTEX)	mg/kg	8.6	2.5	6015855	ND	7.2	9.2	2.5	6015855
>C10-C16 Hydrocarbons	mg/kg	1000	10	6016466	340	750	1800	10	6016466
>C16-C21 Hydrocarbons	mg/kg	530	10	6016466	190	640	1300	10	6016466
>C21-<C32 Hydrocarbons	mg/kg	130	15	6016466	47	220	440	15	6016466
Modified TPH (Tier1)	mg/kg				580	1600	3600	15	6015813
Reached Baseline at C32	mg/kg	Yes	N/A	6016466	Yes	Yes	Yes	N/A	6016466
Hydrocarbon Resemblance	mg/kg				COMMENT (1)	COMMENT (1)	COMMENT (1)	N/A	6016466
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	100		6016466	98	106	110		6016466
n-Dotriacontane - Extractable	%	106		6016466	103	107	112		6016466
Isobutylbenzene - Volatile	%	74		6015855	87	81	71		6015855

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable
(1) Weathered fuel oil fraction.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JEL283			JEL284			JEL285		
Sampling Date		2019/03/11			2019/03/11			2019/03/12		
COC Number		D39902			D39902			D39902		
	UNITS	TP3,SB,2.4-3.0M	RDL	QC Batch	TP3,S8,4.2-4.8M	RDL	QC Batch	TP4,S5,2.4-3.0M	RDL	QC Batch
Inorganics										
Moisture	%	5.0	1.0	6016353	2.4	1.0	6016353	6.7	1.0	6016353
Petroleum Hydrocarbons										
Benzene	mg/kg	ND	0.025	6015855	ND	0.025	6015855	ND	0.025	6015855
Toluene	mg/kg	ND	0.050	6015855	ND	0.050	6015855	ND	0.050	6015855
Ethylbenzene	mg/kg	ND	0.025	6015855	ND	0.025	6015855	ND	0.025	6015855
Total Xylenes	mg/kg	ND	0.050	6015855	ND	0.050	6015855	ND	0.050	6015855
C6 - C10 (less BTEX)	mg/kg	25	2.5	6015855	3.6	2.5	6015855	ND	2.5	6015855
>C10-C16 Hydrocarbons	mg/kg	1500	10	6016466	ND	10	6016466	ND	10	6016466
>C16-C21 Hydrocarbons	mg/kg	1100	10	6016466	ND	10	6016466	11	10	6016466
>C21-<C32 Hydrocarbons	mg/kg	390	15	6016466	ND	15	6016466	37	15	6016466
Modified TPH (Tier1)	mg/kg	3000	15	6015813	ND	15	6015813	48	15	6015813
Reached Baseline at C32	mg/kg	Yes	N/A	6016466	NA	N/A	6016466	Yes	N/A	6016466
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	N/A	6016466				COMMENT (2)	N/A	6016466
Surrogate Recovery (%)										
Isobutylbenzene - Extractable	%	110		6016466	98		6016466	96		6016466
n-Dotriacontane - Extractable	%	112		6016466	103		6016466	105		6016466
Isobutylbenzene - Volatile	%	73		6015855	119		6015855	114		6015855

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Weathered fuel oil fraction.
(2) Weathered fuel oil fraction. Lube oil fraction.

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JEL286	JEL287		JEL288	JEL289		
Sampling Date		2019/03/12	2019/03/12		2019/03/12	2019/03/12		
COC Number		D39902	D39902		D39902	D39902		
	UNITS	TP5,S1,0-0.6M	TP5,S5,2.4-3.0M	QC Batch	TP6,S1,0-0.6M	TP6,S5,2.4-3.0M	RDL	QC Batch
Inorganics								
Moisture	%	3.6	3.4	6016353	5.6	6.8	1.0	6016353
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	6015855	ND	ND	0.025	6018811
Toluene	mg/kg	ND	ND	6015855	ND	ND	0.050	6018811
Ethylbenzene	mg/kg	ND	ND	6015855	ND	ND	0.025	6018811
Total Xylenes	mg/kg	ND	ND	6015855	ND	ND	0.050	6018811
C6 - C10 (less BTEX)	mg/kg	ND	ND	6015855	ND	ND	2.5	6018811
>C10-C16 Hydrocarbons	mg/kg	ND	ND	6016466	ND	ND	10	6016466
>C16-C21 Hydrocarbons	mg/kg	ND	ND	6016466	ND	ND	10	6016466
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	6016466	ND	ND	15	6016466
Modified TPH (Tier1)	mg/kg	ND	ND	6015813	ND	ND	15	6015813
Reached Baseline at C32	mg/kg	NA	NA	6016466	NA	NA	N/A	6016466
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	95	100	6016466	99	95		6016466
n-Dotriacontane - Extractable	%	101	103	6016466	103	99		6016466
Isobutylbenzene - Volatile	%	106	102	6015855	99	76		6018811

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JEL290			JEL291	JEL293	JEL294		
Sampling Date		2019/03/12			2019/03/12	2019/03/12	2019/03/12		
COC Number		D39902			D39902	D39902	D39902		
	UNITS	TP7,S1,0-0.6M	RDL	QC Batch	TP7,S5,2.4-3.0M	TP8,S6(BASE) 4.2M	TP9,S5,2.4-3M	RDL	QC Batch
Inorganics									
Moisture	%	17	1.0	6016353	3.2	4.0	4.2	1.0	6016353
Petroleum Hydrocarbons									
Benzene	mg/kg	ND	0.025	6018811	ND	ND	ND	0.025	6018811
Toluene	mg/kg	ND	0.050	6018811	ND	ND	ND	0.050	6018811
Ethylbenzene	mg/kg	ND	0.025	6018811	ND	ND	ND	0.025	6018811
Total Xylenes	mg/kg	ND	0.050	6018811	ND	ND	ND	0.050	6018811
C6 - C10 (less BTEX)	mg/kg	ND	2.5	6018811	ND	ND	ND	2.5	6018811
>C10-C16 Hydrocarbons	mg/kg	ND	10	6016466	ND	ND	ND	10	6016466
>C16-C21 Hydrocarbons	mg/kg	ND	10	6016466	ND	ND	ND	10	6016466
>C21-<C32 Hydrocarbons	mg/kg	79	15	6016466	ND	ND	ND	15	6016466
Modified TPH (Tier1)	mg/kg	79	15	6015813	ND	ND	ND	15	6015813
Reached Baseline at C32	mg/kg	Yes	N/A	6016466	NA	NA	NA	N/A	6016466
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	N/A	6016466					
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	99		6016466	98	99	96		6016466
n-Dotriacontane - Extractable	%	103		6016466	102	101	100		6016466
Isobutylbenzene - Volatile	%	93		6018811	87	100	100		6018811

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Lube oil fraction.

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JEL295	JEL296		
Sampling Date		2019/03/12	2019/03/12		
COC Number		D39902	D39902		
	UNITS	TP10,S1,0-0.6M	TP10,S5,2.4-3M	RDL	QC Batch
Inorganics					
Moisture	%	3.2	4.4	1.0	6016353
Petroleum Hydrocarbons					
Benzene	mg/kg	ND	ND	0.025	6018811
Toluene	mg/kg	ND	ND	0.050	6018811
Ethylbenzene	mg/kg	ND	ND	0.025	6018811
Total Xylenes	mg/kg	ND	ND	0.050	6018811
C6 - C10 (less BTEX)	mg/kg	ND	ND	2.5	6018811
>C10-C16 Hydrocarbons	mg/kg	ND	ND	10	6016466
>C16-C21 Hydrocarbons	mg/kg	ND	ND	10	6016466
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	15	6016466
Modified TPH (Tier1)	mg/kg	ND	ND	15	6015813
Reached Baseline at C32	mg/kg	NA	NA	N/A	6016466
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	99	95		6016466
n-Dotriacontane - Extractable	%	102	99		6016466
Isobutylbenzene - Volatile	%	79	90		6018811

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.3°C

Results relate only to the items tested.

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6015855	JRD	Matrix Spike [JEL279-01]	Isobutylbenzene - Volatile	2019/03/14		60	%	60 - 130
			Benzene	2019/03/14		83	%	60 - 130
			Toluene	2019/03/14		81	%	60 - 130
			Ethylbenzene	2019/03/14		78	%	60 - 130
			Total Xylenes	2019/03/14		77	%	60 - 130
6015855	JRD	Spiked Blank	Isobutylbenzene - Volatile	2019/03/14		106	%	60 - 130
			Benzene	2019/03/14		73	%	60 - 140
			Toluene	2019/03/14		70	%	60 - 140
			Ethylbenzene	2019/03/14		71	%	60 - 140
			Total Xylenes	2019/03/14		70	%	60 - 140
6015855	JRD	Method Blank	Isobutylbenzene - Volatile	2019/03/14		107	%	60 - 130
			Benzene	2019/03/14	ND, RDL=0.025		mg/kg	
			Toluene	2019/03/14	ND, RDL=0.050		mg/kg	
			Ethylbenzene	2019/03/14	ND, RDL=0.025		mg/kg	
			Total Xylenes	2019/03/14	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2019/03/14	ND, RDL=2.5		mg/kg	
6015855	JRD	RPD [JEL279-01]	Benzene	2019/03/14	NC		%	50
			Toluene	2019/03/14	NC		%	50
			Ethylbenzene	2019/03/14	NC		%	50
			Total Xylenes	2019/03/14	NC		%	50
			C6 - C10 (less BTEX)	2019/03/14	14		%	50
6016353	TMR	RPD [JEL279-01]	Moisture	2019/03/14	8.3		%	25
6016466	SPI	Matrix Spike [JEL279-01]	Isobutylbenzene - Extractable	2019/03/15		105	%	60 - 130
			n-Dotriacontane - Extractable	2019/03/15		112	%	60 - 130
			>C10-C16 Hydrocarbons	2019/03/15		NC	%	30 - 130
			>C16-C21 Hydrocarbons	2019/03/15		NC	%	30 - 130
			>C21-<C32 Hydrocarbons	2019/03/15		83	%	30 - 130
6016466	SPI	Spiked Blank	Isobutylbenzene - Extractable	2019/03/15		98	%	60 - 130
			n-Dotriacontane - Extractable	2019/03/15		107	%	60 - 130
			>C10-C16 Hydrocarbons	2019/03/15		94	%	60 - 130
			>C16-C21 Hydrocarbons	2019/03/15		103	%	60 - 130
			>C21-<C32 Hydrocarbons	2019/03/15		81	%	60 - 130
6016466	SPI	Method Blank	Isobutylbenzene - Extractable	2019/03/15		96	%	60 - 130
			n-Dotriacontane - Extractable	2019/03/15		97	%	60 - 130
			>C10-C16 Hydrocarbons	2019/03/15	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2019/03/15	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2019/03/15	ND, RDL=15		mg/kg	
6016466	SPI	RPD [JEL279-01]	>C10-C16 Hydrocarbons	2019/03/15	6.8		%	50
			>C16-C21 Hydrocarbons	2019/03/15	8.0		%	50
			>C21-<C32 Hydrocarbons	2019/03/15	6.7		%	50
6018811	JRD	Matrix Spike	Isobutylbenzene - Volatile	2019/03/15		112	%	60 - 130
			Benzene	2019/03/15		111	%	60 - 130
			Toluene	2019/03/15		103	%	60 - 130
			Ethylbenzene	2019/03/15		105	%	60 - 130
			Total Xylenes	2019/03/15		108	%	60 - 130
6018811	JRD	Spiked Blank	Isobutylbenzene - Volatile	2019/03/15		88	%	60 - 130

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzene	2019/03/15		94	%	60 - 140
			Toluene	2019/03/15		92	%	60 - 140
			Ethylbenzene	2019/03/15		92	%	60 - 140
			Total Xylenes	2019/03/15		92	%	60 - 140
6018811	JRD	Method Blank	Isobutylbenzene - Volatile	2019/03/15		92	%	60 - 130
			Benzene	2019/03/15	ND, RDL=0.025		mg/kg	
			Toluene	2019/03/15	ND, RDL=0.050		mg/kg	
			Ethylbenzene	2019/03/15	ND, RDL=0.025		mg/kg	
			Total Xylenes	2019/03/15	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2019/03/15	ND, RDL=2.5		mg/kg	
6018811	JRD	RPD	Benzene	2019/03/15	NC		%	50
			Toluene	2019/03/15	NC		%	50
			Ethylbenzene	2019/03/15	NC		%	50
			Total Xylenes	2019/03/15	NC		%	50
			C6 - C10 (less BTEX)	2019/03/15	NC		%	50

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

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

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Maxxam Job #: B964993
Report Date: 2019/03/18

Pinchin LeBlanc Environmental
Client Project #: 2-1-856
Sampler Initials: DG

VALIDATION SIGNATURE PAGE

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

Paula Chaplin, Project Manager Assistant

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

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CHAIN OF CUSTODY RECORD

COC #: D 39902 Page 1 of 2

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: PINCHIN	Company Name: (same)	Quotation #:	☐ Regular TAT (5 business days) Most analyses
Contact Name: Jennifer Dawe	Contact Name:	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 27 AUSTIN ST.	Address:	Project #: 2-1-856	IF RUSH please specify date (Surcharges will be applied)
Postal Code: A1B 4C3	Postal Code:	Site Location:	DATE REQUIRED:
Phone: 709 754 4990 Fax:	Phone: Fax:	Site #:	Fri MAR 15, 2019
Email: jdawe@pinchin.com	Email:	Sampled By:	
⊕ btaite@pinchin.com Laboratory Use Only			

CUSTODY SEAL Present	CUSTODY SEAL Intact	COOLER TEMPERATURES	COOLER TEMPERATURES
		7, 5, 7	7.3°Avg

COOLING MEDIA PRESENT (Y) / N

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

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED &PRESERVED	LAB FILTRATION REQUIRED	RCAP-MS [Total Metals] Well / Surface water	RCAP-MS [Dissolved Metals] Ground waters	Metals (Water): Total Digest (Default Method) for well water & surface water	Metals (Water): Dissolved for ground water	Metals (Water): Mercury (CIRCLE) TOTAL / DISSOLVED	Metals (Soil): Metals & Mercury Default Acid Extractable (Available) Digest	Metals (Soil): Metals Total Digest -for Ocean Sediments (HNO3/HF/HClO4)	Metals (Soil): Mercury Low level by Cold Vapour AA	Metals (Soil): Hot Water Soluble Boron (required for CCME Agricultural/ Landfill)	RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX ,C6-C32	CCME Hydrocarbons (CWS-PHC F1/BTEX, F2-F4)	NB Potable Water BTEX, VPH, Low level T.E.H	PAHs (Default for water/soil)	PAHs (FWAL /CCME Sediment)	PCBs	VOCs	Total Coliform/E.coli (Presence/Absence)	Total Coliform/E.Coli (Count)	HOLD- DO NOT ANALYZE	Regulatory Requirements (Specify) / COMMENTS
1	TP1, S1, 0-0.6m	2019/03/11		SOIL	3												X										
2	TP1, S7, 3.6-4.2m	2019/03/11		SOIL	3												X										
3	TP2, S3, 1.2-1.8 m	2019/03/11		SOIL	3												X							X			
4	TP2, S8, 4.2-4.8m	2019/03/11		SOIL	3												X										
5	TP3, S1, 0-0.6m	2019/03/11		SOIL	3												X										
6	TP3, S5, 2.4-3.0m	2019/03/11		SOIL	3												X							X			
7	TP3, S6, 2.4-3.0m	2019/03/11		SOIL	3												X							X			
8	TP3, S8, 4.2-4.8 m	2019/03/11		SOIL	3												X										
9	TP4, S5, 2.4-3.0m	2019/03/12		SOIL	3												X										
10	TP5, S1, 0-0.6m	2019/03/12		SOIL	3												X										

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
Dawe				MAR 13 2019	14:57	B964493 PMC

White: Maxxam Pink: Client

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465 George Street Unit G,Sydney, NS B1P 1K5 Tel: 902-567-1255 Fax: 902-539-6504 Toll Free: 1-888-535-7770
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ATL FCD 00149 / 22

CHAIN OF CUSTODY RECORD

COC #: D 39900 Page 2 of 2

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: PINCHIN	Company Name: Same	Quotation #:	Regular TAT (5 business days) Most analyses
Contact Name: JENNIFER DAVE	Contact Name:	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 27 AUSTIN ST.	Address:	Project #: 2-1-856	IF RUSH please specify date (Surcharges will be applied)
Postal Code: A1B 4C3	Postal Code:	Site Location:	DATE REQUIRED:
Phone: 709 754 4800 Fax:	Phone: Fax:	Site #:	FRI MAR 15, 2019
Email: jdave@pinchin.com	Email:	Sampled By:	

btaite@pinchin.com

Laboratory Use Only

CUSTODY SEAL Present	CUSTODY SEAL Intact	COOLER TEMPERATURES	COOLER TEMPERATURES
		7, 8, 7	7.3 °Avg

COOLING MEDIA PRESENT (Y) / N

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

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED &PRESERVED	LAB FILTRATION REQUIRED	RCAP-MS [Total Metals] Well / Surface water	RCAP-MS [Dissolved Metals] Ground waters	Metals (Water) Total Digest (Default Method) for well water & surface water	Metals (Water) Dissolved for ground water	Metals (Water) Mercury (CIRCLE) TOTAL / DISSOLVED	Metals (Soil) Metals & Mercury Default Acid Extractable (Available) Digest	Metals (Soil) Metals Total Digest -for Ocean sediments (HNO3/HF/HClO4)	Metals (Soil) Mercury Low level by Cold Vapour AA	Metals (Soil) Hot Water Soluble Boron (required for CCME Agricultural/ Landfill)	RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX, C6-C32	CCME Hydrocarbons (CWS-PHC F1/BTEX, F2-F4)	NB Potable Water BTEX, VPH, Low level T.E.H	PAHs (Default for water/soil)	PAHs (FWAL /CCME Sediment)	PCBs	VOCs	Total Coliform/E.coli (Presence/Absence)	Total Coliform/E.Coli (Count)		HOLD- DO NOT ANALYZE	Regulatory Requirements (Specify) / COMMENTS
1	TP5, S5, 2.4-3.0m	2019/03/12		SOIL	3												X												
2	TP6, S1, 0-0.6m	2019/03/12		SOIL	3												X												
3	TP6, S5, 2.4-3.0m	2019/03/12		SOIL	3												X												
4	TP7, S1, 0-0.6m	2019/03/12		SOIL	3												X												
5	TP7, S5, 2.4-3.0m	2019/03/12		SOIL	3												X												
6	TP8, S4, 1.8-2.4m	2019/03/12		SOIL	3								X				X				X		X						
7	TP8, S6 (BASE) 4.2m	2019/03/12		SOIL	3												X												
8	TP9, S5, 2.4-3m	2019/03/12		SOIL	3												X												
9	TP10, S1, 0-0.6m	2019/03/12		SOIL	3												X												
10	TP10, S5, 2.4-3m	2019/03/12		SOIL	3												X												

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature]			[signature]	MAR 13 2019	1415	B964993 PMC

White: Maxxam Pink: Client

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Your Project #: 2-1-856
Your C.O.C. #: D 39902

Attention: Jennifer Dawe

Pinchin LeBlanc Environmental
St. John's - Standing Offer
27 Austin St
2nd Floor
St. John's, NL
CANADA A1B 4C3

Report Date: 2019/03/15
Report #: R5630649
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B966076
Received: 2019/03/14, 09:49

Sample Matrix: Soil
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Benzo(b/j)fluoranthene Sum (soil)	1	N/A	2019/03/15	N/A	Auto Calc.
TEH in Soil (PIRI) (1)	1	2019/03/14	2019/03/14	ATL SOP 00111	Atl. RBCA v3.1 m
Metals Solids Acid Extr. ICPMS	1	2019/03/15	2019/03/15	ATL SOP 00058	EPA 6020A R1 m
Moisture	4	N/A	2019/03/14	ATL SOP 00001	OMOE Handbook 1983 m
PAH Compounds by GCMS (SIM) (1)	1	2019/03/14	2019/03/14	ATL SOP 00102	EPA 8270E R6 m
PCBs in soil by GC/ECD (1)	1	2019/03/14	2019/03/15	ATL SOP 00106	EPA 8082A 2007 m
PCB Aroclor sum (soil)	1	N/A	2019/03/15	N/A	Auto Calc.
ModTPH (T1) Calc. for Soil	1	N/A	2019/03/15	N/A	Atl. RBCA v3.1 m
VOCs in Soil - Field Preserved (2)	3	N/A	2019/03/14	ATL SOP 00133	EPA 8260D R4 m
VPH in Soil (PIRI) - Field Preserved (2)	1	N/A	2019/03/14	ATL SOP 00119	Atl. RBCA v3.1 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

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Your Project #: 2-1-856
Your C.O.C. #: D 39902

Attention: Jennifer Dawe

Pinchin LeBlanc Environmental
St. John's - Standing Offer
27 Austin St
2nd Floor
St. John's, NL
CANADA A1B 4C3

Report Date: 2019/03/15
Report #: R5630649
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B966076
Received: 2019/03/14, 09:49

(1) Soils are reported on a dry weight basis unless otherwise specified.
(2) No lab extraction date is given for C6-C10/BTEX and VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.

Encryption Key

Maxxam
15 Mar 2019 16:53:10

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Melissa DiPinto, Project Manager
Email: mdipinto@maxxam.ca
Phone# (902) 420-0203
==========
This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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RBCA HYDROCARBONS IN SOIL (FIELD PRES.)

Maxxam ID		JER175			JER175		
Sampling Date		2019/03/12			2019/03/12		
COC Number		D 39902			D 39902		
	UNITS	TP8, S4, 1.8-2.4M	RDL	QC Batch	TP8, S4, 1.8-2.4M Lab-Dup	RDL	QC Batch
Inorganics							
Moisture	%	6.2	1.0	6018051			
Petroleum Hydrocarbons							
Benzene	mg/kg	ND	0.025	6018397	ND	0.025	6018397
Toluene	mg/kg	ND	0.050	6018397	ND	0.050	6018397
Ethylbenzene	mg/kg	ND	0.025	6018397	ND	0.025	6018397
Total Xylenes	mg/kg	ND	0.050	6018397	ND	0.050	6018397
C6 - C10 (less BTEX)	mg/kg	ND	2.5	6018397	ND	2.5	6018397
>C10-C16 Hydrocarbons	mg/kg	ND	10	6018463	ND	10	6018463
>C16-C21 Hydrocarbons	mg/kg	17	10	6018463	14	10	6018463
>C21-<C32 Hydrocarbons	mg/kg	96	15	6018463	95	15	6018463
Modified TPH (Tier1)	mg/kg	110	15	6018034			
Reached Baseline at C32	mg/kg	Yes	N/A	6018463			
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	N/A	6018463			
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	86		6018463	86		6018463
n-Dotriacontane - Extractable	%	95		6018463	94		6018463
Isobutylbenzene - Volatile	%	98		6018397	98		6018397

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable
(1) Unidentified compound(s) in fuel oil range. Lube oil fraction.

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ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		JER172	JER172	JER173	JER174		
Sampling Date		2019/03/11	2019/03/11	2019/03/11	2019/03/11		
COC Number		D 39902	D 39902	D 39902	D 39902		
	UNITS	TP2, S3, 1.2-1.8M	TP2, S3, 1.2-1.8M Lab-Dup	TP3, S5, 2.4-3.0M	TP3, SB, 2.4-3.0M	RDL	QC Batch
Inorganics							
Moisture	%	3.6	3.8	6.0	5.4	1.0	6018051
Volatile Organics							
1,1,1-Trichloroethane	ug/kg	ND	ND	ND	ND	25	6018100
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND	ND	ND	25	6018100
1,1,2-Trichloroethane	ug/kg	ND	ND	ND	ND	25	6018100
1,1-Dichloroethane	ug/kg	ND	ND	ND	ND	25	6018100
1,1-Dichloroethylene	ug/kg	ND	ND	ND	ND	25	6018100
1,2-Dichlorobenzene	ug/kg	ND	ND	ND	ND	25	6018100
1,2-Dichloroethane	ug/kg	ND	ND	ND	ND	25	6018100
1,2-Dichloropropane	ug/kg	ND	ND	ND	ND	25	6018100
1,3-Dichlorobenzene	ug/kg	ND	ND	ND	ND	25	6018100
1,4-Dichlorobenzene	ug/kg	ND	ND	ND	ND	25	6018100
Benzene	ug/kg	ND	ND	ND	ND	25	6018100
Bromodichloromethane	ug/kg	ND	ND	ND	ND	25	6018100
Bromoform	ug/kg	ND	ND	ND	ND	25	6018100
Bromomethane	ug/kg	ND	ND	ND	ND	50	6018100
Carbon Tetrachloride	ug/kg	ND	ND	ND	ND	25	6018100
Chlorobenzene	ug/kg	ND	ND	ND	ND	25	6018100
Chloroethane	ug/kg	ND	ND	ND	ND	200	6018100
Chloroform	ug/kg	ND	ND	ND	ND	25	6018100
cis-1,2-Dichloroethylene	ug/kg	ND	ND	ND	ND	25	6018100
cis-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	25	6018100
Dibromochloromethane	ug/kg	ND	ND	ND	ND	25	6018100
Ethylbenzene	ug/kg	ND	ND	ND	ND	25	6018100
Ethylene Dibromide	ug/kg	ND	ND	ND	ND	25	6018100
Methyl t-butyl ether (MTBE)	ug/kg	ND	ND	ND	ND	25	6018100
Methylene Chloride(Dichloromethane)	ug/kg	ND	ND	ND	ND	25	6018100
o-Xylene	ug/kg	ND	ND	ND	ND	25	6018100
p+m-Xylene	ug/kg	ND	ND	ND	ND	25	6018100
Styrene	ug/kg	ND	ND	ND	ND	25	6018100
Tetrachloroethylene	ug/kg	ND	ND	ND	ND	25	6018100
Toluene	ug/kg	ND	ND	ND	ND	50	6018100
Total Xylenes	ug/kg	ND	ND	ND	ND	50	6018100

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B966076
Report Date: 2019/03/15

Pinchin LeBlanc Environmental
Client Project #: 2-1-856

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		JER172	JER172	JER173	JER174		
Sampling Date		2019/03/11	2019/03/11	2019/03/11	2019/03/11		
COC Number		D 39902	D 39902	D 39902	D 39902		
	UNITS	TP2, S3, 1.2-1.8M	TP2, S3, 1.2-1.8M Lab-Dup	TP3, S5, 2.4-3.0M	TP3, SB, 2.4-3.0M	RDL	QC Batch
trans-1,2-Dichloroethylene	ug/kg	ND	ND	ND	ND	25	6018100
trans-1,3-Dichloropropene	ug/kg	ND	ND	ND	ND	25	6018100
Trichloroethylene	ug/kg	ND	ND	ND	ND	10	6018100
Trichlorofluoromethane (FREON 11)	ug/kg	ND	ND	ND	ND	25	6018100
Vinyl Chloride	ug/kg	ND	ND	ND	ND	20	6018100
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	98	93	107	105		6018100
D10-o-Xylene	%	93 (1)	107 (1)	108	123		6018100
D4-1,2-Dichloroethane	%	94	90	90	90		6018100
D8-Toluene	%	100	104	105	104		6018100

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

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ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		JER175	JER175		
Sampling Date		2019/03/12	2019/03/12		
COC Number		D 39902	D 39902		
	UNITS	TP8, S4, 1.8-2.4M	TP8, S4, 1.8-2.4M Lab-Dup	RDL	QC Batch
Metals					
Acid Extractable Aluminum (Al)	mg/kg	9000	9300	10	6019995
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	2.0	6019995
Acid Extractable Arsenic (As)	mg/kg	ND	ND	2.0	6019995
Acid Extractable Barium (Ba)	mg/kg	29	34	5.0	6019995
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	2.0	6019995
Acid Extractable Bismuth (Bi)	mg/kg	ND	ND	2.0	6019995
Acid Extractable Boron (B)	mg/kg	ND	ND	50	6019995
Acid Extractable Cadmium (Cd)	mg/kg	ND	ND	0.30	6019995
Acid Extractable Chromium (Cr)	mg/kg	27	32	2.0	6019995
Acid Extractable Cobalt (Co)	mg/kg	6.5	7.3	1.0	6019995
Acid Extractable Copper (Cu)	mg/kg	21	22	2.0	6019995
Acid Extractable Iron (Fe)	mg/kg	15000	18000	50	6019995
Acid Extractable Lead (Pb)	mg/kg	6.6	9.2	0.50	6019995
Acid Extractable Lithium (Li)	mg/kg	2.8	3.5	2.0	6019995
Acid Extractable Manganese (Mn)	mg/kg	150	180	2.0	6019995
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	0.10	6019995
Acid Extractable Molybdenum (Mo)	mg/kg	ND	ND	2.0	6019995
Acid Extractable Nickel (Ni)	mg/kg	20	20	2.0	6019995
Acid Extractable Rubidium (Rb)	mg/kg	2.8	3.2	2.0	6019995
Acid Extractable Selenium (Se)	mg/kg	ND	ND	1.0	6019995
Acid Extractable Silver (Ag)	mg/kg	ND	ND	0.50	6019995
Acid Extractable Strontium (Sr)	mg/kg	22	21	5.0	6019995
Acid Extractable Thallium (Tl)	mg/kg	ND	ND	0.10	6019995
Acid Extractable Tin (Sn)	mg/kg	ND	ND	1.0	6019995
Acid Extractable Uranium (U)	mg/kg	0.20	0.28	0.10	6019995
Acid Extractable Vanadium (V)	mg/kg	36	43	2.0	6019995
Acid Extractable Zinc (Zn)	mg/kg	63	64	5.0	6019995

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		JER175			JER175		
Sampling Date		2019/03/12			2019/03/12		
COC Number		D 39902			D 39902		
	UNITS	TP8, S4, 1.8-2.4M	RDL	QC Batch	TP8, S4, 1.8-2.4M Lab-Dup	RDL	QC Batch
Polyaromatic Hydrocarbons							
1-Methylnaphthalene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
2-Methylnaphthalene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Acenaphthene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Acenaphthylene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Anthracene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Benzo(a)anthracene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Benzo(a)pyrene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Benzo(b)fluoranthene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Benzo(b/j)fluoranthene	mg/kg	ND	0.020	6017988			
Benzo(g,h,i)perylene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Benzo(j)fluoranthene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Benzo(k)fluoranthene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Chrysene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Dibenz(a,h)anthracene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Fluoranthene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Fluorene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Indeno(1,2,3-cd)pyrene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Naphthalene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Perylene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Phenanthrene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Pyrene	mg/kg	ND	0.010	6018191	ND	0.010	6018191
Surrogate Recovery (%)							
D10-Anthracene	%	93		6018191	96		6018191
D14-Terphenyl (FS)	%	93		6018191	96		6018191
D8-Acenaphthylene	%	95		6018191	95		6018191

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B966076
Report Date: 2019/03/15

Pinchin LeBlanc Environmental
Client Project #: 2-1-856

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		JER175			JER175		
Sampling Date		2019/03/12			2019/03/12		
COC Number		D 39902			D 39902		
	UNITS	TP8, S4, 1.8-2.4M	RDL	QC Batch	TP8, S4, 1.8-2.4M Lab-Dup	RDL	QC Batch
PCBs							
Aroclor 1016	ug/g	ND	0.050	6018426	ND	0.050	6018426
Aroclor 1221	ug/g	ND	0.050	6018426	ND	0.050	6018426
Aroclor 1232	ug/g	ND	0.050	6018426	ND	0.050	6018426
Aroclor 1248	ug/g	ND	0.050	6018426	ND	0.050	6018426
Aroclor 1242	ug/g	ND	0.050	6018426	ND	0.050	6018426
Aroclor 1254	ug/g	ND	0.050	6018426	ND	0.050	6018426
Aroclor 1260	ug/g	ND	0.050	6018426	ND	0.050	6018426
Calculated Total PCB	ug/g	ND	0.050	6017992			
Surrogate Recovery (%)							
Decachlorobiphenyl	%	95		6018426	92		6018426

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	7.3°C

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
6018051	SDN	RPD [JER172-01]	Moisture	2019/03/14	5.4		%	25
6018100	ASL	Matrix Spike [JER172-02]	4-Bromofluorobenzene	2019/03/14		105	%	60 - 140
			D10-o-Xylene	2019/03/14		104 (1)	%	60 - 130
			D4-1,2-Dichloroethane	2019/03/14		90	%	60 - 140
			D8-Toluene	2019/03/14		104	%	60 - 140
			1,1,1-Trichloroethane	2019/03/14		105	%	60 - 140
			1,1,2,2-Tetrachloroethane	2019/03/14		101	%	60 - 140
			1,1,2-Trichloroethane	2019/03/14		98	%	60 - 140
			1,1-Dichloroethane	2019/03/14		100	%	60 - 140
			1,1-Dichloroethylene	2019/03/14		104	%	60 - 140
			1,2-Dichlorobenzene	2019/03/14		103	%	60 - 140
			1,2-Dichloroethane	2019/03/14		88	%	60 - 140
			1,2-Dichloropropane	2019/03/14		98	%	60 - 140
			1,3-Dichlorobenzene	2019/03/14		102	%	60 - 140
			1,4-Dichlorobenzene	2019/03/14		102	%	60 - 140
			Benzene	2019/03/14		98	%	60 - 140
			Bromodichloromethane	2019/03/14		95	%	60 - 140
			Bromoform	2019/03/14		89	%	60 - 140
			Bromomethane	2019/03/14		86	%	60 - 140
			Carbon Tetrachloride	2019/03/14		102	%	60 - 140
			Chlorobenzene	2019/03/14		98	%	60 - 140
			Chloroethane	2019/03/14		84	%	60 - 140
			Chloroform	2019/03/14		88	%	60 - 140
			cis-1,2-Dichloroethylene	2019/03/14		103	%	60 - 140
			cis-1,3-Dichloropropene	2019/03/14		98	%	60 - 140
			Dibromochloromethane	2019/03/14		107	%	60 - 140
			Ethylbenzene	2019/03/14		114	%	60 - 140
			Ethylene Dibromide	2019/03/14		101	%	60 - 140
			Methyl t-butyl ether (MTBE)	2019/03/14		102	%	60 - 140
			Methylene Chloride(Dichloromethane)	2019/03/14		97	%	60 - 140
			o-Xylene	2019/03/14		109	%	60 - 140
			p+m-Xylene	2019/03/14		113	%	60 - 140
			Styrene	2019/03/14		114	%	60 - 140
			Tetrachloroethylene	2019/03/14		108	%	60 - 140
			Toluene	2019/03/14		109	%	60 - 140
			trans-1,2-Dichloroethylene	2019/03/14		107	%	60 - 140
			trans-1,3-Dichloropropene	2019/03/14		92	%	60 - 140
			Trichloroethylene	2019/03/14		108	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2019/03/14		91	%	60 - 140
			Vinyl Chloride	2019/03/14		81	%	60 - 140
6018100	ASL	Spiked Blank	4-Bromofluorobenzene	2019/03/14		103	%	60 - 140
			D10-o-Xylene	2019/03/14		102	%	60 - 130
			D4-1,2-Dichloroethane	2019/03/14		97	%	60 - 140
			D8-Toluene	2019/03/14		99	%	60 - 140
			1,1,1-Trichloroethane	2019/03/14		112	%	60 - 130
			1,1,2,2-Tetrachloroethane	2019/03/14		103	%	60 - 130
			1,1,2-Trichloroethane	2019/03/14		105	%	60 - 130
			1,1-Dichloroethane	2019/03/14		111	%	60 - 130
			1,1-Dichloroethylene	2019/03/14		115	%	60 - 130
			1,2-Dichlorobenzene	2019/03/14		101	%	60 - 130
			1,2-Dichloroethane	2019/03/14		97	%	60 - 130
			1,2-Dichloropropane	2019/03/14		108	%	60 - 130
			1,3-Dichlorobenzene	2019/03/14		103	%	60 - 130
			1,4-Dichlorobenzene	2019/03/14		102	%	60 - 130
			Benzene	2019/03/14		106	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Bromodichloromethane	2019/03/14		104	%	60 - 130
			Bromoform	2019/03/14		99	%	60 - 130
			Bromomethane	2019/03/14		101	%	60 - 140
			Carbon Tetrachloride	2019/03/14		110	%	60 - 130
			Chlorobenzene	2019/03/14		103	%	60 - 130
			Chloroethane	2019/03/14		97	%	60 - 140
			Chloroform	2019/03/14		98	%	60 - 130
			cis-1,2-Dichloroethylene	2019/03/14		112	%	60 - 130
			cis-1,3-Dichloropropene	2019/03/14		105	%	60 - 130
			Dibromochloromethane	2019/03/14		106	%	60 - 130
			Ethylbenzene	2019/03/14		114	%	60 - 130
			Ethylene Dibromide	2019/03/14		107	%	60 - 130
			Methyl t-butyl ether (MTBE)	2019/03/14		108	%	60 - 130
			Methylene Chloride(Dichloromethane)	2019/03/14		110	%	60 - 130
			o-Xylene	2019/03/14		113	%	60 - 130
			p+m-Xylene	2019/03/14		112	%	60 - 130
			Styrene	2019/03/14		111	%	60 - 130
			Tetrachloroethylene	2019/03/14		115	%	60 - 130
			Toluene	2019/03/14		110	%	60 - 130
			trans-1,2-Dichloroethylene	2019/03/14		117	%	60 - 130
			trans-1,3-Dichloropropene	2019/03/14		101	%	60 - 130
			Trichloroethylene	2019/03/14		114	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2019/03/14		101	%	60 - 140
			Vinyl Chloride	2019/03/14		94	%	60 - 140
6018100	ASL	Method Blank	4-Bromofluorobenzene	2019/03/14		102	%	60 - 140
			D10-o-Xylene	2019/03/14		98	%	60 - 130
			D4-1,2-Dichloroethane	2019/03/14		93	%	60 - 140
			D8-Toluene	2019/03/14		99	%	60 - 140
			1,1,1-Trichloroethane	2019/03/14	ND, RDL=25		ug/kg	
			1,1,2,2-Tetrachloroethane	2019/03/14	ND, RDL=25		ug/kg	
			1,1,2-Trichloroethane	2019/03/14	ND, RDL=25		ug/kg	
			1,1-Dichloroethane	2019/03/14	ND, RDL=25		ug/kg	
			1,1-Dichloroethylene	2019/03/14	ND, RDL=25		ug/kg	
			1,2-Dichlorobenzene	2019/03/14	ND, RDL=25		ug/kg	
			1,2-Dichloroethane	2019/03/14	ND, RDL=25		ug/kg	
			1,2-Dichloropropane	2019/03/14	ND, RDL=25		ug/kg	
			1,3-Dichlorobenzene	2019/03/14	ND, RDL=25		ug/kg	
			1,4-Dichlorobenzene	2019/03/14	ND, RDL=25		ug/kg	
			Benzene	2019/03/14	ND, RDL=25		ug/kg	
			Bromodichloromethane	2019/03/14	ND, RDL=25		ug/kg	
			Bromoform	2019/03/14	ND, RDL=25		ug/kg	
			Bromomethane	2019/03/14	ND, RDL=50		ug/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Carbon Tetrachloride	2019/03/14	ND, RDL=25		ug/kg	
			Chlorobenzene	2019/03/14	ND, RDL=25		ug/kg	
			Chloroethane	2019/03/14	ND, RDL=200		ug/kg	
			Chloroform	2019/03/14	ND, RDL=25		ug/kg	
			cis-1,2-Dichloroethylene	2019/03/14	ND, RDL=25		ug/kg	
			cis-1,3-Dichloropropene	2019/03/14	ND, RDL=25		ug/kg	
			Dibromochloromethane	2019/03/14	ND, RDL=25		ug/kg	
			Ethylbenzene	2019/03/14	ND, RDL=25		ug/kg	
			Ethylene Dibromide	2019/03/14	ND, RDL=25		ug/kg	
			Methyl t-butyl ether (MTBE)	2019/03/14	ND, RDL=25		ug/kg	
			Methylene Chloride(Dichloromethane)	2019/03/14	ND, RDL=25		ug/kg	
			o-Xylene	2019/03/14	ND, RDL=25		ug/kg	
			p+m-Xylene	2019/03/14	ND, RDL=25		ug/kg	
			Styrene	2019/03/14	ND, RDL=25		ug/kg	
			Tetrachloroethylene	2019/03/14	ND, RDL=25		ug/kg	
			Toluene	2019/03/14	ND, RDL=50		ug/kg	
			Total Xylenes	2019/03/14	ND, RDL=50		ug/kg	
			trans-1,2-Dichloroethylene	2019/03/14	ND, RDL=25		ug/kg	
			trans-1,3-Dichloropropene	2019/03/14	ND, RDL=25		ug/kg	
			Trichloroethylene	2019/03/14	ND, RDL=10		ug/kg	
			Trichlorofluoromethane (FREON 11)	2019/03/14	ND, RDL=25		ug/kg	
			Vinyl Chloride	2019/03/14	ND, RDL=20		ug/kg	
6018100	ASL	RPD [JER172-02]	1,1,1-Trichloroethane	2019/03/14	NC		%	50
			1,1,2,2-Tetrachloroethane	2019/03/14	NC		%	50
			1,1,2-Trichloroethane	2019/03/14	NC		%	50
			1,1-Dichloroethane	2019/03/14	NC		%	50
			1,1-Dichloroethylene	2019/03/14	NC		%	50
			1,2-Dichlorobenzene	2019/03/14	NC		%	50
			1,2-Dichloroethane	2019/03/14	NC		%	50
			1,2-Dichloropropane	2019/03/14	NC		%	50
			1,3-Dichlorobenzene	2019/03/14	NC		%	50
			1,4-Dichlorobenzene	2019/03/14	NC		%	50
			Benzene	2019/03/14	NC		%	50
			Bromodichloromethane	2019/03/14	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Bromoform	2019/03/14	NC		%	50
			Bromomethane	2019/03/14	NC		%	50
			Carbon Tetrachloride	2019/03/14	NC		%	50
			Chlorobenzene	2019/03/14	NC		%	50
			Chloroethane	2019/03/14	NC		%	50
			Chloroform	2019/03/14	NC		%	50
			cis-1,2-Dichloroethylene	2019/03/14	NC		%	50
			cis-1,3-Dichloropropene	2019/03/14	NC		%	50
			Dibromochloromethane	2019/03/14	NC		%	50
			Ethylbenzene	2019/03/14	NC		%	50
			Ethylene Dibromide	2019/03/14	NC		%	50
			Methyl t-butyl ether (MTBE)	2019/03/14	NC		%	50
			Methylene Chloride(Dichloromethane)	2019/03/14	NC		%	50
			o-Xylene	2019/03/14	NC		%	50
			p+m-Xylene	2019/03/14	NC		%	50
			Styrene	2019/03/14	NC		%	50
			Tetrachloroethylene	2019/03/14	NC		%	50
			Toluene	2019/03/14	NC		%	50
			Total Xylenes	2019/03/14	NC		%	50
			trans-1,2-Dichloroethylene	2019/03/14	NC		%	50
			trans-1,3-Dichloropropene	2019/03/14	NC		%	50
			Trichloroethylene	2019/03/14	NC		%	50
			Trichlorofluoromethane (FREON 11)	2019/03/14	NC		%	50
			Vinyl Chloride	2019/03/14	NC		%	50
6018191	KKE	Matrix Spike [JER175-01]	D10-Anthracene	2019/03/14		95	%	50 - 130
			D14-Terphenyl (FS)	2019/03/14		96	%	50 - 130
			D8-Acenaphthylene	2019/03/14		92	%	50 - 130
			1-Methylnaphthalene	2019/03/14		84	%	50 - 130
			2-Methylnaphthalene	2019/03/14		89	%	50 - 130
			Acenaphthene	2019/03/14		91	%	50 - 130
			Acenaphthylene	2019/03/14		86	%	50 - 130
			Anthracene	2019/03/14		89	%	50 - 130
			Benzo(a)anthracene	2019/03/14		83	%	50 - 130
			Benzo(a)pyrene	2019/03/14		98	%	50 - 130
			Benzo(b)fluoranthene	2019/03/14		119	%	50 - 130
			Benzo(g,h,i)perylene	2019/03/14		113	%	50 - 130
			Benzo(j)fluoranthene	2019/03/14		100	%	50 - 130
			Benzo(k)fluoranthene	2019/03/14		112	%	50 - 130
			Chrysene	2019/03/14		82	%	50 - 130
			Dibenz(a,h)anthracene	2019/03/14		105	%	50 - 130
			Fluoranthene	2019/03/14		90	%	50 - 130
			Fluorene	2019/03/14		89	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/03/14		109	%	50 - 130
			Naphthalene	2019/03/14		89	%	50 - 130
			Perylene	2019/03/14		96	%	50 - 130
			Phenanthrene	2019/03/14		89	%	50 - 130
			Pyrene	2019/03/14		85	%	50 - 130
6018191	KKE	Spiked Blank	D10-Anthracene	2019/03/14		100	%	50 - 130
			D14-Terphenyl (FS)	2019/03/14		100	%	50 - 130
			D8-Acenaphthylene	2019/03/14		94	%	50 - 130
			1-Methylnaphthalene	2019/03/14		85	%	50 - 130
			2-Methylnaphthalene	2019/03/14		91	%	50 - 130
			Acenaphthene	2019/03/14		88	%	50 - 130
			Acenaphthylene	2019/03/14		89	%	50 - 130
			Anthracene	2019/03/14		95	%	50 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(a)anthracene	2019/03/14		89	%	50 - 130
			Benzo(a)pyrene	2019/03/14		90	%	50 - 130
			Benzo(b)fluoranthene	2019/03/14		110	%	50 - 130
			Benzo(g,h,i)perylene	2019/03/14		105	%	50 - 130
			Benzo(j)fluoranthene	2019/03/14		91	%	50 - 130
			Benzo(k)fluoranthene	2019/03/14		103	%	50 - 130
			Chrysene	2019/03/14		85	%	50 - 130
			Dibenz(a,h)anthracene	2019/03/14		94	%	50 - 130
			Fluoranthene	2019/03/14		94	%	50 - 130
			Fluorene	2019/03/14		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2019/03/14		99	%	50 - 130
			Naphthalene	2019/03/14		90	%	50 - 130
			Perylene	2019/03/14		91	%	50 - 130
			Phenanthrene	2019/03/14		94	%	50 - 130
			Pyrene	2019/03/14		88	%	50 - 130
6018191	KKE	Method Blank	D10-Anthracene	2019/03/14		110	%	50 - 130
			D14-Terphenyl (FS)	2019/03/14		113	%	50 - 130
			D8-Acenaphthylene	2019/03/14		102	%	50 - 130
			1-Methylnaphthalene	2019/03/14	ND, RDL=0.010		mg/kg	
			2-Methylnaphthalene	2019/03/14	ND, RDL=0.010		mg/kg	
			Acenaphthene	2019/03/14	ND, RDL=0.010		mg/kg	
			Acenaphthylene	2019/03/14	ND, RDL=0.010		mg/kg	
			Anthracene	2019/03/14	ND, RDL=0.010		mg/kg	
			Benzo(a)anthracene	2019/03/14	ND, RDL=0.010		mg/kg	
			Benzo(a)pyrene	2019/03/14	ND, RDL=0.010		mg/kg	
			Benzo(b)fluoranthene	2019/03/14	ND, RDL=0.010		mg/kg	
			Benzo(g,h,i)perylene	2019/03/14	ND, RDL=0.010		mg/kg	
			Benzo(j)fluoranthene	2019/03/14	ND, RDL=0.010		mg/kg	
			Benzo(k)fluoranthene	2019/03/14	ND, RDL=0.010		mg/kg	
			Chrysene	2019/03/14	ND, RDL=0.010		mg/kg	
			Dibenz(a,h)anthracene	2019/03/14	ND, RDL=0.010		mg/kg	
			Fluoranthene	2019/03/14	ND, RDL=0.010		mg/kg	
			Fluorene	2019/03/14	ND, RDL=0.010		mg/kg	
			Indeno(1,2,3-cd)pyrene	2019/03/14	ND, RDL=0.010		mg/kg	
			Naphthalene	2019/03/14	ND, RDL=0.010		mg/kg	
			Perylene	2019/03/14	ND, RDL=0.010		mg/kg	
			Phenanthrene	2019/03/14	ND, RDL=0.010		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Pyrene	2019/03/14	ND, RDL=0.010		mg/kg	
6018191	KKE	RPD [JER175-01]	1-Methylnaphthalene	2019/03/14	NC		%	50
			2-Methylnaphthalene	2019/03/14	NC		%	50
			Acenaphthene	2019/03/14	NC		%	50
			Acenaphthylene	2019/03/14	NC		%	50
			Anthracene	2019/03/14	NC		%	50
			Benzo(a)anthracene	2019/03/14	NC		%	50
			Benzo(a)pyrene	2019/03/14	NC		%	50
			Benzo(b)fluoranthene	2019/03/14	NC		%	50
			Benzo(g,h,i)perylene	2019/03/14	NC		%	50
			Benzo(j)fluoranthene	2019/03/14	NC		%	50
			Benzo(k)fluoranthene	2019/03/14	NC		%	50
			Chrysene	2019/03/14	NC		%	50
			Dibenz(a,h)anthracene	2019/03/14	NC		%	50
			Fluoranthene	2019/03/14	NC		%	50
			Fluorene	2019/03/14	NC		%	50
			Indeno(1,2,3-cd)pyrene	2019/03/14	NC		%	50
			Naphthalene	2019/03/14	NC		%	50
			Perylene	2019/03/14	NC		%	50
			Phenanthrene	2019/03/14	NC		%	50
			Pyrene	2019/03/14	NC		%	50
6018397	SHL	Matrix Spike [JER175-02]	Isobutylbenzene - Volatile	2019/03/14		93	%	60 - 130
			Benzene	2019/03/14		87	%	60 - 130
			Toluene	2019/03/14		87	%	60 - 130
			Ethylbenzene	2019/03/14		92	%	60 - 130
			Total Xylenes	2019/03/14		88	%	60 - 130
6018397	SHL	Spiked Blank	Isobutylbenzene - Volatile	2019/03/14		95	%	60 - 130
			Benzene	2019/03/14		87	%	60 - 140
			Toluene	2019/03/14		89	%	60 - 140
			Ethylbenzene	2019/03/14		91	%	60 - 140
			Total Xylenes	2019/03/14		90	%	60 - 140
6018397	SHL	Method Blank	Isobutylbenzene - Volatile	2019/03/14		100	%	60 - 130
			Benzene	2019/03/14	ND, RDL=0.025		mg/kg	
			Toluene	2019/03/14	ND, RDL=0.050		mg/kg	
			Ethylbenzene	2019/03/14	ND, RDL=0.025		mg/kg	
			Total Xylenes	2019/03/14	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2019/03/14	ND, RDL=2.5		mg/kg	
6018397	SHL	RPD [JER175-02]	Benzene	2019/03/14	NC		%	50
			Toluene	2019/03/14	NC		%	50
			Ethylbenzene	2019/03/14	NC		%	50
			Total Xylenes	2019/03/14	NC		%	50
			C6 - C10 (less BTEX)	2019/03/14	NC		%	50
6018426	RGE	Matrix Spike [JER175-01]	Decachlorobiphenyl	2019/03/15		92	%	70 - 130
			Aroclor 1254	2019/03/15		105	%	70 - 130
6018426	RGE	Spiked Blank	Decachlorobiphenyl	2019/03/15		95	%	70 - 130
			Aroclor 1254	2019/03/15		89	%	70 - 130
6018426	RGE	Method Blank	Decachlorobiphenyl	2019/03/15		95	%	70 - 130
			Aroclor 1016	2019/03/15	ND, RDL=0.050		ug/g	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Aroclor 1221	2019/03/15	ND, RDL=0.050		ug/g	
			Aroclor 1232	2019/03/15	ND, RDL=0.050		ug/g	
			Aroclor 1248	2019/03/15	ND, RDL=0.050		ug/g	
			Aroclor 1242	2019/03/15	ND, RDL=0.050		ug/g	
			Aroclor 1254	2019/03/15	ND, RDL=0.050		ug/g	
			Aroclor 1260	2019/03/15	ND, RDL=0.050		ug/g	
6018426	RGE	RPD [JER175-01]	Aroclor 1016	2019/03/15	NC		%	50
			Aroclor 1221	2019/03/15	NC		%	50
			Aroclor 1232	2019/03/15	NC		%	50
			Aroclor 1248	2019/03/15	NC		%	50
			Aroclor 1242	2019/03/15	NC		%	50
			Aroclor 1254	2019/03/15	NC		%	50
			Aroclor 1260	2019/03/15	NC		%	50
6018463	BCD	Matrix Spike [JER175-01]	Isobutylbenzene - Extractable	2019/03/14		88	%	60 - 130
			n-Dotriacontane - Extractable	2019/03/14		90	%	60 - 130
			>C10-C16 Hydrocarbons	2019/03/14		81	%	30 - 130
			>C16-C21 Hydrocarbons	2019/03/14		80	%	30 - 130
			>C21-<C32 Hydrocarbons	2019/03/14		96	%	30 - 130
6018463	BCD	Spiked Blank	Isobutylbenzene - Extractable	2019/03/14		89	%	60 - 130
			n-Dotriacontane - Extractable	2019/03/14		92	%	60 - 130
			>C10-C16 Hydrocarbons	2019/03/14		81	%	60 - 130
			>C16-C21 Hydrocarbons	2019/03/14		81	%	60 - 130
			>C21-<C32 Hydrocarbons	2019/03/14		113	%	60 - 130
6018463	BCD	Method Blank	Isobutylbenzene - Extractable	2019/03/14		95	%	60 - 130
			n-Dotriacontane - Extractable	2019/03/14		97	%	60 - 130
			>C10-C16 Hydrocarbons	2019/03/14	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2019/03/14	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2019/03/14	ND, RDL=15		mg/kg	
6018463	BCD	RPD [JER175-01]	>C10-C16 Hydrocarbons	2019/03/14	NC		%	50
			>C16-C21 Hydrocarbons	2019/03/14	24		%	50
			>C21-<C32 Hydrocarbons	2019/03/14	0.74		%	50
6019995	MLB	Matrix Spike [JER175-01]	Acid Extractable Antimony (Sb)	2019/03/15		99	%	75 - 125
			Acid Extractable Arsenic (As)	2019/03/15		105	%	75 - 125
			Acid Extractable Barium (Ba)	2019/03/15		104	%	75 - 125
			Acid Extractable Beryllium (Be)	2019/03/15		105	%	75 - 125
			Acid Extractable Bismuth (Bi)	2019/03/15		103	%	75 - 125
			Acid Extractable Boron (B)	2019/03/15		107	%	75 - 125
			Acid Extractable Cadmium (Cd)	2019/03/15		97	%	75 - 125
			Acid Extractable Chromium (Cr)	2019/03/15		141 (2)	%	75 - 125
			Acid Extractable Cobalt (Co)	2019/03/15		106	%	75 - 125
			Acid Extractable Copper (Cu)	2019/03/15		107	%	75 - 125
			Acid Extractable Lead (Pb)	2019/03/15		125	%	75 - 125
			Acid Extractable Lithium (Li)	2019/03/15		106	%	75 - 125
			Acid Extractable Manganese (Mn)	2019/03/15		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2019/03/15		94	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2019/03/15		117	%	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Nickel (Ni)	2019/03/15		110	%	75 - 125
			Acid Extractable Rubidium (Rb)	2019/03/15		103	%	75 - 125
			Acid Extractable Selenium (Se)	2019/03/15		107	%	75 - 125
			Acid Extractable Silver (Ag)	2019/03/15		101	%	75 - 125
			Acid Extractable Strontium (Sr)	2019/03/15		106	%	75 - 125
			Acid Extractable Thallium (Tl)	2019/03/15		104	%	75 - 125
			Acid Extractable Tin (Sn)	2019/03/15		100	%	75 - 125
			Acid Extractable Uranium (U)	2019/03/15		108	%	75 - 125
			Acid Extractable Vanadium (V)	2019/03/15		107	%	75 - 125
			Acid Extractable Zinc (Zn)	2019/03/15		NC	%	75 - 125
6019995	MLB	Spiked Blank	Acid Extractable Antimony (Sb)	2019/03/15		100	%	75 - 125
			Acid Extractable Arsenic (As)	2019/03/15		102	%	75 - 125
			Acid Extractable Barium (Ba)	2019/03/15		95	%	75 - 125
			Acid Extractable Beryllium (Be)	2019/03/15		100	%	75 - 125
			Acid Extractable Bismuth (Bi)	2019/03/15		101	%	75 - 125
			Acid Extractable Boron (B)	2019/03/15		109	%	75 - 125
			Acid Extractable Cadmium (Cd)	2019/03/15		94	%	75 - 125
			Acid Extractable Chromium (Cr)	2019/03/15		106	%	75 - 125
			Acid Extractable Cobalt (Co)	2019/03/15		101	%	75 - 125
			Acid Extractable Copper (Cu)	2019/03/15		101	%	75 - 125
			Acid Extractable Lead (Pb)	2019/03/15		96	%	75 - 125
			Acid Extractable Lithium (Li)	2019/03/15		100	%	75 - 125
			Acid Extractable Manganese (Mn)	2019/03/15		101	%	75 - 125
			Acid Extractable Mercury (Hg)	2019/03/15		106	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2019/03/15		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2019/03/15		102	%	75 - 125
			Acid Extractable Rubidium (Rb)	2019/03/15		99	%	75 - 125
			Acid Extractable Selenium (Se)	2019/03/15		103	%	75 - 125
			Acid Extractable Silver (Ag)	2019/03/15		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2019/03/15		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2019/03/15		102	%	75 - 125
			Acid Extractable Tin (Sn)	2019/03/15		97	%	75 - 125
			Acid Extractable Uranium (U)	2019/03/15		95	%	75 - 125
			Acid Extractable Vanadium (V)	2019/03/15		102	%	75 - 125
			Acid Extractable Zinc (Zn)	2019/03/15		104	%	75 - 125
6019995	MLB	Method Blank	Acid Extractable Aluminum (Al)	2019/03/15	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2019/03/15	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2019/03/15	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2019/03/15	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2019/03/15	ND, RDL=1.0		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Copper (Cu)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2019/03/15	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2019/03/15	ND, RDL=0.50		mg/kg	
			Acid Extractable Lithium (Li)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2019/03/15	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2019/03/15	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2019/03/15	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2019/03/15	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2019/03/15	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2019/03/15	ND, RDL=1.0		mg/kg	
			Acid Extractable Uranium (U)	2019/03/15	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2019/03/15	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2019/03/15	ND, RDL=5.0		mg/kg	
6019995	MLB	RPD [JER175-01]	Acid Extractable Aluminum (Al)	2019/03/15	3.7		%	35
			Acid Extractable Antimony (Sb)	2019/03/15	NC		%	35
			Acid Extractable Arsenic (As)	2019/03/15	NC		%	35
			Acid Extractable Barium (Ba)	2019/03/15	16		%	35
			Acid Extractable Beryllium (Be)	2019/03/15	NC		%	35
			Acid Extractable Bismuth (Bi)	2019/03/15	NC		%	35
			Acid Extractable Boron (B)	2019/03/15	NC		%	35
			Acid Extractable Cadmium (Cd)	2019/03/15	NC		%	35
			Acid Extractable Chromium (Cr)	2019/03/15	16		%	35
			Acid Extractable Cobalt (Co)	2019/03/15	11		%	35
			Acid Extractable Copper (Cu)	2019/03/15	1.1		%	35
			Acid Extractable Iron (Fe)	2019/03/15	15		%	35
			Acid Extractable Lead (Pb)	2019/03/15	34		%	35
			Acid Extractable Lithium (Li)	2019/03/15	21		%	35
			Acid Extractable Manganese (Mn)	2019/03/15	13		%	35
			Acid Extractable Mercury (Hg)	2019/03/15	NC		%	35
			Acid Extractable Molybdenum (Mo)	2019/03/15	NC		%	35
			Acid Extractable Nickel (Ni)	2019/03/15	2.8		%	35
			Acid Extractable Rubidium (Rb)	2019/03/15	15		%	35
			Acid Extractable Selenium (Se)	2019/03/15	NC		%	35
			Acid Extractable Silver (Ag)	2019/03/15	NC		%	35
			Acid Extractable Strontium (Sr)	2019/03/15	5.8		%	35

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Acid Extractable Thallium (Tl)	2019/03/15	NC		%	35
			Acid Extractable Tin (Sn)	2019/03/15	NC		%	35
			Acid Extractable Uranium (U)	2019/03/15	35		%	35
			Acid Extractable Vanadium (V)	2019/03/15	19		%	35
			Acid Extractable Zinc (Zn)	2019/03/15	0.92		%	35

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

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

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

(2) Matrix Spike exceeds acceptance limits, probable matrix interference.

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Maxxam Job #: B966076
Report Date: 2019/03/15

Pinchin LeBlanc Environmental
Client Project #: 2-1-856

VALIDATION SIGNATURE PAGE

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

Eric Dearman, Scientific Specialist

Rosemarie MacDonald, Scientific Specialist (Organics)

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

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CHAIN OF CUSTODY RECORD

COC #: D 39902 Page 1 of 2

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: PINCHIN	Company Name: (same)	Quotation #:	☐ Regular TAT (5 business days) Most analyses
Contact Name: Jennifer Dawe	Contact Name:	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 27 AUSTIN ST.	Address:	Project #: 2-1-856	If RUSH please specify date (Surcharges will be applied)
Postal Code: A1B 4C3	Postal Code:	Site Location:	
Phone: 709 754 4490 Fax:	Phone: Fax:	Site #:	DATE REQUIRED:
Email: jdawe@pinchin.com	Email:	Sampled By:	FRI MAR 15, 2019

(+) btaite@pinchin.com

Laboratory Use Only

CUSTODY SEAL Present	CUSTODY SEAL Intact	COOLER TEMPERATURES	COOLER TEMPERATURES
		7, 8, 7	7.3°Avg

COOLING MEDIA PRESENT (Y) / N

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

Analysis Requested

Regulatory Requirements (Specify):

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED & PRESERVED	LAB FILTRATION REQUIRED	RCAP-MS (Total Metals) Well / Surface water	RCAP-MS (Dissolved Metals) Ground waters	Metals (Water): Total Digest (Default Method) for well water & surface water	Metals (Water): Dissolved for ground water	Metals (Water): Mercury (CIRCLE) TOTAL / DISSOLVED	Metals (Soil): Metals & Mercury Default Acid Extractable (Available) Digest	Metals (Soil): Metals Total Digest -for Ocean sediments (HNO3/HF/HClO4)	Metals (Soil): Mercury Low level by Cold Vapour AA	Metals (Soil): Hot Water Soluble Boron (required for CCME Agricultural/ Landfill)	RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX, C6-C32	CCME Hydrocarbons (CWS-PHC F1/BTEX, F2-F4)	NB Potable Water BTEX, VPH, Low level T.E.H	PAHs (Default for water/soil)	PAHs (FWAL /CCME Sediment)	PCBs	VOCs	Total Coliform/E.coli (Presence/Absence)	Total Coliform/E.Coli (Count)		HOLD- DO NOT ANALYZE	COMMENTS
1	TP1 S1 0-0.6m	2019/03/11		SOIL	3												X												
2	TP1, S7, 3.6-4.2m	2019/03/11		SOIL	3												X												
3	TP2, S3, 1.2-1.8 m	2019/03/11		SOIL	3												X							X					
4	TP2, S8, 4.2-4.8m	2019/03/11		SOIL	3												X												
5	TP3, S1, 0-0.6m	2019/03/11		SOIL	3												X												
6	TP3, S5, 2.4-3.0m	2019/03/11		SOIL	3												X							X					
7	TP3 SB, 2.4-3.0m	2019/03/11		SOIL	3												X							X					
8	TP3, S8, 4.2-4.8 m	2019/03/11		SOIL	3												X												
9	TP4, S5, 2.4-3.0m	2019/03/12		SOIL	3												X												
10	TP5, S1, 0-0.6m	2019/03/12		SOIL	3												X												

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature]			[signature]	MAR 13 2019	14:5	B964993
						B966076 PMC

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CHAIN OF CUSTODY RECORD

COC #: D 39900 Page 2 of 2

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: PINCHIN	Company Name: Same	Quotation #:	Regular TAT (5 business days) Most
Contact Name: JENNIFER DAWE	Contact Name:	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 27 AUSTIN ST.	Address:	Project #: 2-1-856	IF RUSH please specify date (Surcharges will be applied)
Postal Code: A1B 4C3	Postal Code:	Site Location:	DATE REQUIRED:
Phone: 709 754 4900 Fax:	Phone: Fax:	Site #:	FRI MAR 15, 2019
Email: ~~jdawe~~ jdawe@pinchin.com	Email:	Sampled By:	
btuite@pinchin.com	Laboratory Use Only		

CUSTODY SEAL Present	CUSTODY SEAL Intact	COOLER TEMPERATURES	COOLER TEMPERATURES
		7, 8, 7	7.3° Avg

COOLING MEDIA PRESENT (Y) / N

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

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED & PRESERVED	LAB FILTRATION REQUIRED	RCAP-MS (Total Metals) Well / Surface water	RCAP-MS (Dissolved Metals) Ground waters	Metals (Water): Total Digest (Default Method) for well water & surface water	Metals (Water): Dissolved for ground water	Metals (Water): Mercury (CIRCLE) TOTAL / DISSOLVED	Metals (Soil): Metals & Mercury (Default Aqua Regia Extractable (Available) Digest	Metals (Soil): Metals Total Digest (for Ocean sediments (HNO3/HF/HClO4))	Metals (Soil): Mercury Low-level by Cold Vapour AA	Metals (Soil): Hot Water Soluble Boron (required for CCME Agricultural/ Landfill)	RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons Soil (Potable/ NS Fuel Oil Spill Policy Low Level BTEX, C6-C32)	CCME Hydrocarbons (CWS-PHC F1/BTEX, F2-F4)	NB Potable Water BTEX, VPH, Low level T.E.H	PAHs (Default for water/soil)	PAHs (FWAL /CCME Sediment)	PCBs	VOCs	Total Coliform/E.coli (Presence/Absence)	Total Coliform/E.Coli (Count)		HOLD: DO NOT ANALYZE	Regulatory Requirements (Specify) / COMMENTS
1	TP5, SS, 2.4-3.0m	2019/03/12		SOIL	W												X											
2	TP6, S1, 0-0.6m	2019/03/12		SOIL	W												X											
3	TP6, SS, 2.4-3.0m	2019/03/12		SOIL	W												X											
4	TP7, S1, 0-0.6m	2019/03/12		SOIL	W												X											
5	TP7, SS, 2.4-3.0m	2019/03/12		SOIL	W												X											
6	TP8, S4, 1.8-2.4m	2019/03/12		SOIL	W								X				X				X		X					
7	TP8, S6 (BASE) 4.2m	2019/03/12		SOIL	W												X											
8	TP9, SS, 2.4-3m	2019/03/12		SOIL	W												X											
9	TP10, S1, 0-0.6m	2019/03/12		SOIL	W												X											
10	TP10, SS, 2.4-3m	2019/03/12		SOIL	W												X											

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
				MAR 13 2019	14:5	B964493 PM B966876

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TPH Must Done in NL - Except TP8, S4

Bedford must do TPH Limited Samples

Easting	Northing	Altitude	Name	Timestamp
394118	5367160	18	TP6	########
394208	5367163	20	TP8	########
394232	5367170	20	TP3	########
394289	5367187	22	TP4	########
394253	5367181	21	TP2	########
394201	5367192	21	TP1	########
394150	5367193	20	TP5	########
394260	5367217	21	TP7	########
394177	5367157	20	TP9	########
394229	5367159	22	TP10	########


hois Brook
150, 000 SF
Carters Rd

CONCEPT 01

LEVEL ONE FLOOR PLAN

SCALE: As indicated

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COMPANY SIGNATURE DATE

PRINT NAME

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0' 4' 8' 16' 32'

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BIRD

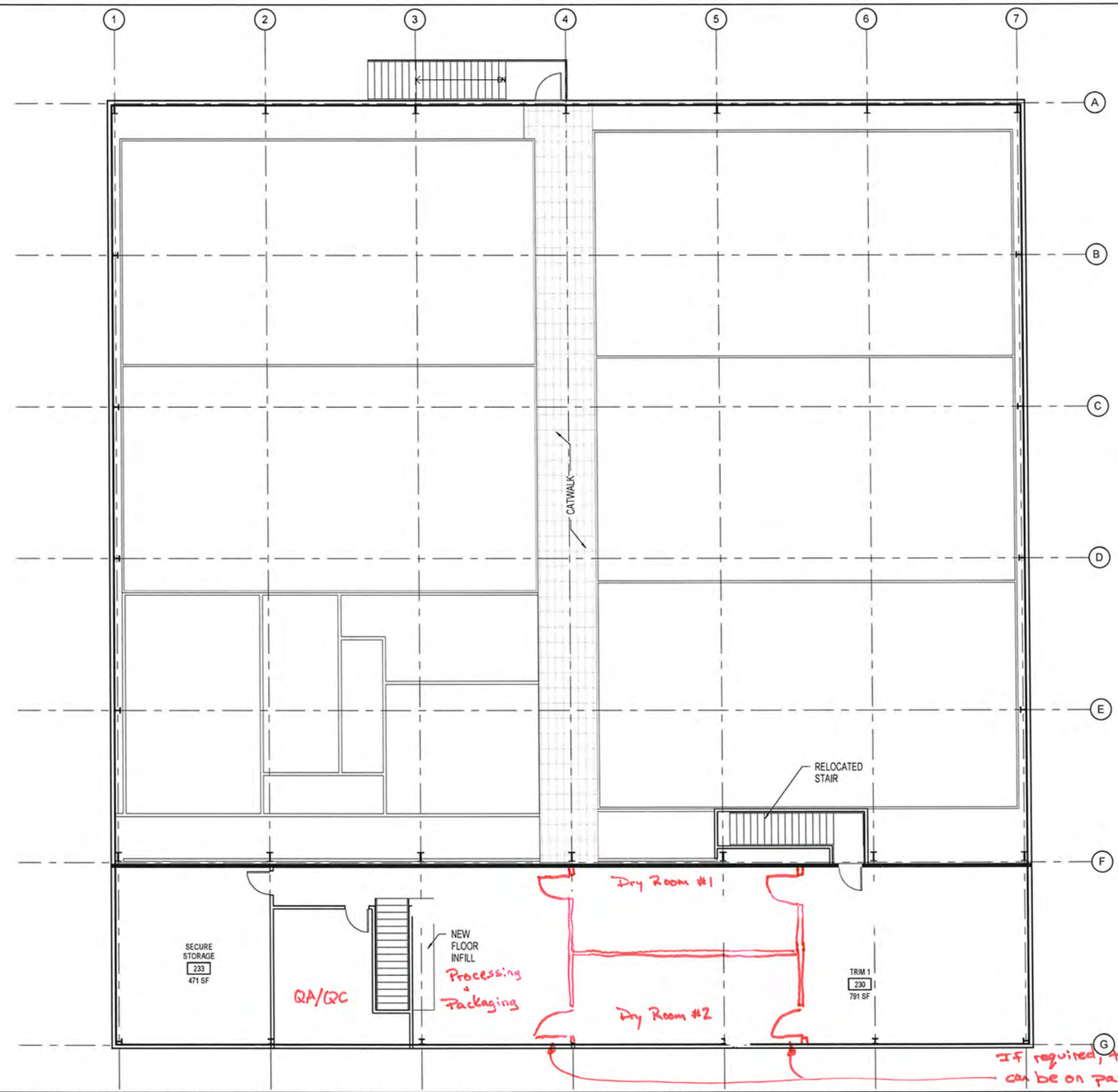
powers brown architecture

ST. JOHN'S 02/07/18 NEWFOUNDLAND DH 183003

CONCEPT - 01

LEVEL TWO FLOOR PLAN

SCALE: As indicated



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A PROJECT FOR
BIRD

powers brown architecture

GEMTEC
www.gemtec.ca

Report to:

Northeast Well Drilling Company Ltd.
407 Little Bay Road,
Springdale, NL A0J 1T0

Aquifer Test Analysis
Water Well
Western Construction Property
Barachois Brook, NL

June 18, 2018
Project: 80033.05

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1.0 INTRODUCTION

Acting on the authorization of Mr. Ted Robinson of Northeast Well Drilling Company Ltd. (Northeast Well Drilling), GEMTEC Consulting Engineers and Scientists Limited (GEMTEC) carried out analysis of aquifer test data collected from an existing water well (referred to as Well 1 in this report) located on the Western Construction property in Barachois Brook, Newfoundland and Labrador (NL) (see Figure No. 1 in Appendix A). As part of this investigation, GEMTEC carried out analysis of data obtained from a step drawdown test, a 24-hour constant rate aquifer test and recovery monitoring completed on the well to evaluate the efficiency and drawdown behavior of the well, and to determine the optimum discharge rate for long-term production. GEMTEC did not supervise the aquifer testing, and analysis is based solely on the data and information provided by Northeast Well Drilling. This report contains all of the findings, results, conclusions, and recommendations for this study.

2.0 SITE DESCRIPTION, GEOLOGY AND HYDROGEOLOGY

The Western Construction property is located along Provincial Highway Route 461 (St. George's Highway) in the community of Barachois Brook, NL in western Newfoundland. Well 1 is located in a gravel area of the property, approximately 20 m south of the site building (hereafter referred to as the "Site") (as shown on Figure No. 2 in Appendix A). The Site is situated in a flat, low-lying area approximately 250 m north of Little Barachois Brook and sits at an elevation of approximately 15 m above sea level (masl). The area of the Site is mainly gravel covered. The provincial Drilled Water Well Database (NLDEC, 2008) indicates that another well is present on the property; however this well could not be located by Northeast Well Drilling while on site completing the aquifer testing program.

Based on a review of geological maps, the overburden material in the area generally consists of a greater than 1 m thick sequence of glacial outwash and fluvial sand and gravel that forms a relatively flat flood plain, with local areas of undulating terraces, and hummocks (Batterson, 2001). Along with this glaciofluvial material, the area of the site is also underlain by local silt and clay marine deposits. Available well logs for the Barachois Brook area, including the well log for the subject well, indicate overburden thickness at the site and in the surrounding area are typically greater than 25 m.

Although no exposures of bedrock have been mapped in the site area, it is thought that beneath the thick accumulation of unconsolidated overburden, the bedrock geology comprises a sequence of siliciclastic sedimentary rocks belonging to the Carboniferous Barachois, Codroy, and Anguille Groups (Knight, 1983).

The site and surrounding area is considered to be underlain by an unconfined aquifer system contained within the overburden material and underlying shallow bedrock. The movement of groundwater through the overburden material is controlled by primary porosity, while groundwater

flow within the underlying bedrock can be expected to mainly occur within secondary openings, such as fractures and joints, and will be variable depending on the frequency and interconnection of these structural features. It is expected that shallow groundwater flow at the site is controlled by water table conditions and local variations in topography with recharge mainly from surface runoff and local recharge; while at moderate depths the flow system may be influenced by recharge at higher elevations to the northwest. The general direction of shallow groundwater flow at the site is assumed to follow topography, which would be to the south towards Little Barachois Brook. The water table at the site is approximately 14 m below ground surface (mbgs) within the glaciofluvial overburden material based on groundwater level measurements recorded during the current aquifer testing program.

3.0 PROCEDURES AND METHODOLOGY

3.1 Well Construction

Well construction details for Well 1 are summarized in Table 3.1, and are based on information provided in the provincial Drilled Water Well Database (NLDEC, 2008). In the provincial water well database the subject well is referenced with Well ID 11097. GEMTEC was not provided with a Drilled Water Well Record for the well. The well record from the provincial Drilled Water Well database is provided in Appendix B.

Table 3.1 Summary of Well Construction Information

Well ID[1]	Date Drilled	Depth (m)	Casing Length (m)	Diameter (mm)	Water Level (mbgs)	Estimated Yield (L/min)	Comments
11097	Aug. 28, 1984	26.2	26	152	Not provided	114	Well cased over entire length. No well screen installed.

Notes:
[1] – Well ID in the provincial Drilled Water Well Database (NLDEC, 2008).

3.2 Aquifer Testing

Aquifer testing was carried out on Well 1 by Northeast Well Drilling in general accordance with the provincial guidelines (Aquifer Testing Guidelines; available online at http://www.mae.gov.nl.ca/waterres/regulations/appforms/Aquifer_Testing_Final.pdf), and comprised a step drawdown test, and a 24-hour constant rate test, followed by water level recovery monitoring.

A step drawdown test was conducted on the well on May 30, 2018 to evaluate the drawdown behavior and efficiency of the well and to determine the optimum pumping rate for subsequent constant rate aquifer testing. The step drawdown test consisted of pumping the well at incrementally higher pumping rates with no recovery between steps while monitoring the water

level in the well. Table 3.2 provides a summary of the step drawdown test conducted on the well during the current investigation.

Table 3.2 Summary of Step Drawdown Test

Well ID	Step Drawdown Tests				
	Date	Step	Pumping Rate (Q) (L/min)	Time Interval (min)	Total Time (min)
Well 1	05/30/2018	1	11.4	30	120
		2	18.9	30	
		3	37.9	30	
		4	64.4	30	

For the step drawdown test, the pumping rate was varied from approximately 11.4 L/min to 64.4 L/min for a total duration of 120 minutes, and comprised four (4) steps of 30 minutes each.

Using the results of the step drawdown test, a 24-hour constant rate test was conducted from May 31 to June 1, 2018 at a constant pumping rate of approximately 64.4 L/min. Immediately following the 24-hour pumping test, the submersible pump was turned off and recovery measurements were collected until the well reached at least 70% recovery.

For both the step drawdown and constant rate test, a submersible pump (4" 2HP Franklin Electric) was lowered down the well and set at a depth of approximately 23 m below top of casing (mbtoc). The discharge rates, which were controlled using a flow valve, were measured by recording the time to fill a container of known volume. Water was discharged approximately 20 m down-gradient and away from the well head during testing. Water level measurements were collected manually and recorded as mbtoc at pre-determined time intervals using an electronic water level meter.

3.3 Water Quality Testing

A total of two (2) water samples were collected from the well by Northeast Well Drilling for chemical (i.e., general chemistry parameters and trace metals), including one (1) water sample (i.e., Barachois Brook #1) collected on May 31, 2018, approximately 30 minutes after the start of the constant rate test and one (1) water sample (i.e., Barachois Brook #2) collected on June 1, 2018, immediately prior to the completion of the constant rate test. In addition, one bacteriological water sample (18:WA0002219R) was collected from Well 1 by Northeast Well Drilling on June 4, 2018.

All water samples were collected into clean plastic and glass bottles provided by the laboratory and stored on ice in a cooler until they were submitted to the appropriate laboratory for analysis. The water samples were submitted to the Avalon Laboratories in Paradise, NL for analysis of general chemistry and trace metals, and to the Newfoundland and Labrador Public Health Laboratory in Grand Falls, NL for analysis of bacteria (total coliform and fecal coliform).

4.0 RESULTS

The following is a summary of the various tests conducted from May 30 to June 4, 2018 on the subject water well.

4.1 Step Drawdown Test

The step drawdown test at Well 1 was completed on May 30, 2018 and consisted of four (4) steps. Table 4.1 presents a summary of step drawdown test data for each step. Data collected during the tests are presented in Appendix C. A plot of drawdown versus time for the step drawdown test in the well is shown in Figure D-1 in Appendix D.

Table 4.1 Summary of Step Drawdown Test Data

Well ID	Step	Pumping Rate (Q) (L/min)	Water Level at end of step (mbtoc)	Drawdown (m)	Specific Capacity (Q/s) (L/min/m)	Well Efficiency (%)
Well 1			14.7 (SWL)			
	1	11.4	15.11	0.41	27.80	83
	2	18.9	15.42	0.72	26.14	75
	3	37.9	16.60	1.90	19.95	60
	4	64.4	18.75	4.05	15.88	47

Notes:
mbtoc = metres below top of casing. Casing stick-up = 0.4 m; SWL = static water level

The results of the step drawdown test for the well indicate that for all four (4) steps (i.e., from 11.4 L/min to 64.4 L/min), the drawdown versus time curve was flattening at the end of the step indicating that water levels were approaching steady state conditions at these pumping rates. Drawdown was monitored for a total of 120 minutes and the water level was 18.75 mbtoc and still decreasing when the test was terminated.

An estimate of the optimum pumping rate for the well can be obtained by plotting the specific drawdown (i.e., drawdown divided by pumping rate (s/Q)) versus pumping rate (Q) for each step (as shown in Figure D-2 in Appendix D). The slope and intercept of a regression line fitted to these points give the coefficients of the equation describing drawdown in a pumping well.

$$dd = BQ + CQ^2$$

where: dd = drawdown (m);

Q = pumping rate (L/min);

B = coefficient for laminar component of drawdown (intercept); and,

C = coefficient for turbulent component of drawdown (slope).

Based on analysis of the step drawdown data and the stabilization of drawdown in the well associated with a pumping rate of 64.4 L/min, this pumping rate was selected for the constant rate test. The slope of the line also provides an indication of the efficiency of the well relative to the host aquifer. The flatter the slope of the line the greater the efficiency of the well, since there is less head loss in the well as a result of increased pumping. This is also indicated by the ratio of the BQ term (drawdown due to laminar flow) to total drawdown (also referred to as the Well Efficiency). The calculated coefficients of laminar and turbulent flow for the well are provided in Table 4.2.

Table 4.2 Summary of Step Drawdown Test Analysis Results

Water Well	Intercept (B)	Slope (C)
Well 1	0.0294	0.0005

The slope in the step drawdown test analysis of Well 1 indicates a moderately efficient well and the positive slope indicates that some increase in drawdown can be expected with higher pumping rates. This is also indicated by the decrease in specific capacity from 27.8 L/min/m to 15.9 L/min/m over the course of step drawdown test (refer to Table 4.1). Based on the ratio of laminar component of drawdown to total predicted drawdown, the well is operating at 47% efficiency at the pumping rate used for the constant rate aquifer test.

4.2 Constant Rate Test

The 24-hour constant rate test was conducted from May 31 to June 1, 2018 at a constant rate of approximately 64.4 L/min (determined from the step drawdown test). A review of the data plots indicates that during the first one (1) minute, the water level decreased steadily to approximately 17.2 mbtoc, after which the rate of drawdown decreased steadily, and levelled to 3.9 mbtoc at 20 minutes showing only minor mm-scale fluctuations for the remainder of the test. A total drawdown of 3.92 m was measured over the 24-hour duration of the constant rate test.

Immediately following the 24-hour constant rate test, the submersible pump was turned off and recovery measurements were collected. The water level increased approximately 3.91 m during the period of recovery monitoring of 60 minutes, which corresponds to approximately 99% of the original static water level of 14.71 mbtoc, recorded at the beginning of the test.

Data collected during the constant rate test and recovery monitoring are presented in Appendix C, and plots of drawdown versus time for the 24-hour constant rate test and recovery monitoring (Figure D-3 & D-4, respectively) are provided in Appendix D.

Analysis of the constant rate test data was performed with the aid of the computer program AQTESOLV® Version 4.50.002 (HydroSOLVE Inc., Reston, VA), and using the Neuman (1974) method, which is applicable for a partially penetrating well in an unconfined aquifer. The analysis results matching the constant rate test data with the Neuman-type curve are presented below and a graphical display is presented in Appendix E. The apparent transmissivity (T) of the aquifer, computed from the Neuman (1974) analysis of the drawdown versus time data for the pumping well returned a value of 1.15 x 10^{-4} m^2/s. There were no observation well data, so a storativity value could not be computed. The 24-hour specific capacity was 16.43 L/min/m.

4.3 Safe Well Yield

The long-term safe yield of the well was calculated using the apparent T value calculated from analysis of the drawdown/recovery versus time data for the well (i.e., 1.15 x 10^{-4} m^2/s) and an available drawdown of 5 m (i.e., approximately one-half of the thickness of the saturated water column in the well) using the following equation:

$$Q_t = \frac{0.7 \times T \times \Delta s}{0.183 \times \log(t)}$$

Where: T = aquifer/well transmissivity (m^2/s);

S = available drawdown (m);

t = time (minutes); and,

Q_t = continuous pumping rate for a given time t (m^3/s)

A safety factor of 0.7 is incorporated into the theoretical safe yield values to account for any uncertainties in the calculated values of transmissivity and to account for undetected boundary conditions, seasonal water level fluctuations and borehole head losses.

The calculated theoretical long-term safe yield for the well, which is presented in Table 4.3 ranges from a high of 73.96 L/min (19.54 USgpm) for a one-hour period of continuous pumping to 18.73 L/min (4.95 USgpm) for a 20 year period. Since seasonal recharge is likely to occur in the vicinity of the wells, a 100-day safe yield of approximately 25.49 L/min (6.74 USgpm) is considered a representative estimate of the theoretical long-term safe yield potential of the well. However, water levels in the well were relatively stable at approximately 18.62 mbtoc at the end of the constant rate test and a pumping rate of 64.4 L/min, suggesting that higher pumping rates may be possible for short periods (e.g., 1 hour).

Table 4.3 Theoretical Safe Pumping Yields for the Specified Time Periods

Time Period	Time Period (minutes)	Q_t (m^3/s)	Q_t (L/min)	Q_t (USgpm)
1 hour	60	$1.23x10^{-3}$	73.96	19.54
8 hour	480	$8.175x10^{-4}$	49.05	12.96
1 day	1,440	$6.940x10^{-4}$	41.64	11.00
30 days	43,200	$4.728x10^{-4}$	28.37	7.50
100 days	**144,000**	**$4.249x10^{-4}$**	**25.49**	**6.74**
1 year	525,600	$3.831x10^{-4}$	22.99	6.07
20 years	10,512,000	$3.121x10^{-4}$	18.73	4.95

4.4 Groundwater Quality

The chemical analytical and bacteriological results of water samples Barachois Brook #1 and Barachois Brook #2 are summarized in Tables F-1 and F-2 in Appendix F. Full analytical results for the chemical and bacteriological analysis are presented in certificates of analysis from Avalon Laboratories and the Newfoundland and Labrador Public Health Laboratory in Grand Falls, NL, respectively, and are also provided in Appendix F.

All groundwater parameters that were analyzed were compared to the applicable Guidelines for Canadian Drinking Water Quality (CDWQ), (Health Canada, 2017). The results of laboratory analysis of general chemistry parameters and trace metals indicate that concentrations of all parameters tested were within their respective CDWQ guidelines, with the exception of the following:

- The levels of iron and manganese were 0.47 mg/L and 0.08 mg/L, respectively, in water sample Barachois Brook #1 collected at the beginning of the constant rate test, exceeding the CDWQ guidelines of 0.3 mg/L and 0.05 mg/L, respectively, for these metals parameters. The CDWQ guidelines for iron and manganese are aesthetic objectives and are not considered a health concern, however; problems such as foul taste, deposition or staining may be experienced. The results of the follow-up water sample, Barachois Brook

#2, collected at the end of the constant rate test, returned a concentration of iron and manganese below their respective CDWQ guideline values. The reduction in the concentrations of iron and manganese in the well water at the end of the test is likely due to flushing of stagnant water from the well during the aquifer testing.

In addition, the results of the microbiological analysis indicated that no total coliforms or fecal coliforms were present in the water sample collected from the well, and the laboratory report indicates that the water from Well 1 is satisfactory for drinking water.

5.0 CONCLUSIONS & RECOMMENDATIONS

The results of the aquifer test analyses and water quality data indicate:

- The average transmissivity of the well calculated from the 24-hour constant rate test is 1.15 x 10^{-4} m^2/s.
- Quantitative evaluation of the aquifer test results indicate the 100-day continuous safe yield is approximately 25.5 L/min (19.5 USgpm), assuming an available drawdown of 5 m. This is a theoretical calculated value based on short-term testing (24 hours), and actual safe yields may vary with increased drawdown in the well. Since water levels in the well were relatively stable at approximately 18.62 mbtoc at the end of the constant rate test and a pumping rate of 64.4 L/min, higher pumping rates maybe be possible for short periods (e.g., 1 hour).
- Note that the aquifer test data analysis was completed assuming the well was operating independently and no consideration was given to the effects of well interference that may occur should an adjacent well be operated simultaneously.
- Standard precautions should be taken in completion of the production well, such as installation of a low level switch at the top of the pump assembly to prevent breaking suction by drawing the water below the pump intake. In addition, water levels in the well should be monitored regularly (e.g., bi-weekly) for a period of one year after commissioning to determine the reliability of the safe yield predictions.
- Based on results of the chemical analysis of water samples collected during the investigation, water in the well is considered a suitable and adequate source of potable water from both a chemical and bacteriological water quality perspective. It is recommended that over the operational life of the well, sampling and analysis for general chemistry and trace metals be conducted regularly to monitor water quality. Further, any Department of Health requirements for routine water bacteria sampling should also be conducted.

6.0 CLOSURE

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.

Respectfully submitted,

GEMTEC Consulting Engineers and Scientists Limited

Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo.

Senior Environmental Geoscientist

7.0 REFERENCES

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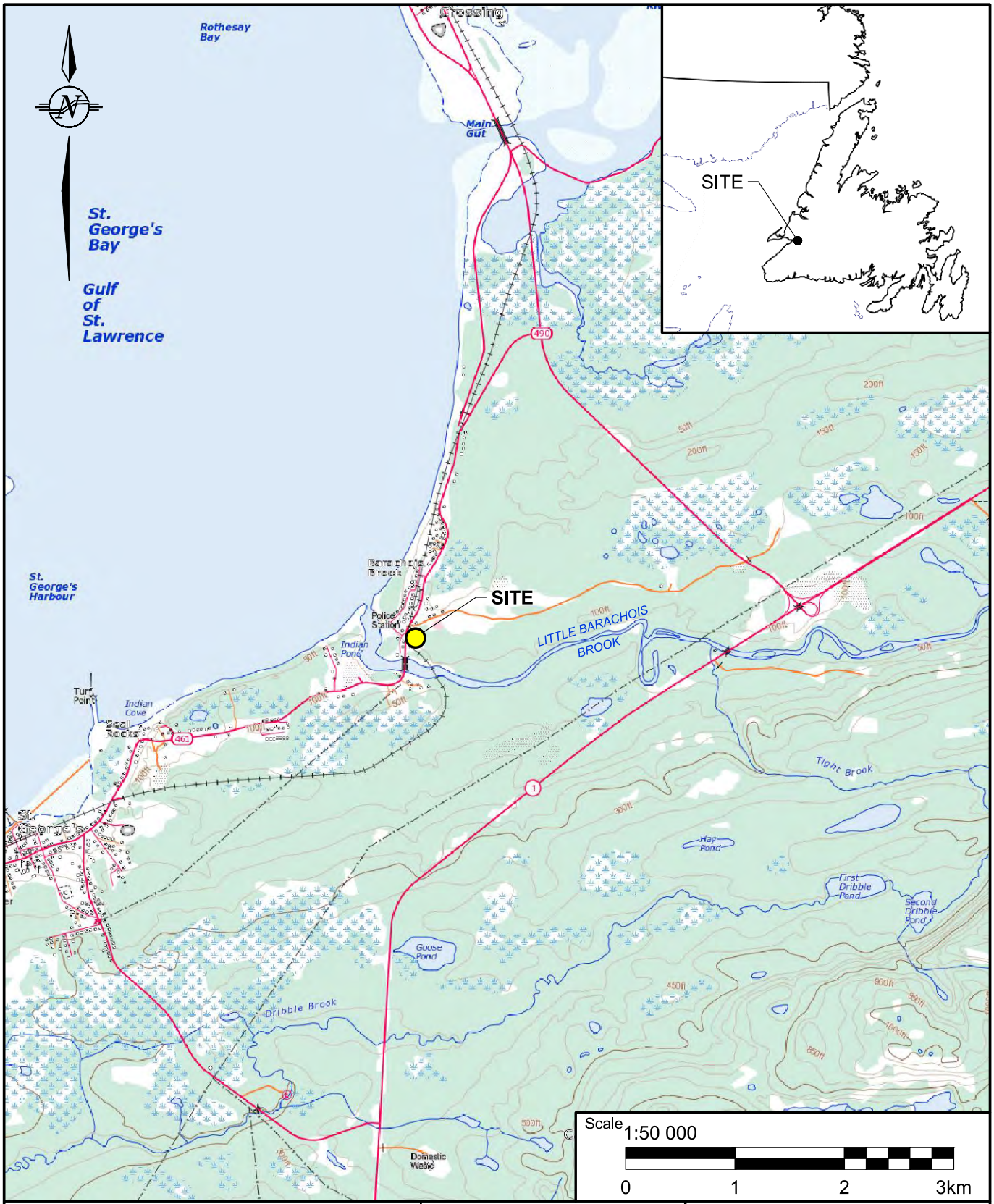
APPENDIX A

Drawings



Project: AQUIFER TEST ANALYSIS WATER WELL WESTERN CONSTRUCTION PROPERTY BARACHOIS BROOK, NL.			Drawing: SITE LOCATION PLAN	
Drawn By: CHG	Date: JUN 2018	File No.: 800330501	Drawing No.: FIGURE 1	Revision No.: 0

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Legend

WELL

Note

THIS DRAWING IS A SCHEMATIC REPRESENTATION.
SIZES, LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

Scale 1:1500

0 30 60 90m

Project: AQUIFER TEST ANALYSIS WATER WELL WESTERN CONSTRUCTION PROPERTY BARACHOIS BROOK, NL.			Drawing: WELL LOCATION PLAN	
Drawn By: CHG	Date: JUN 2018	File No.: 800330501	Drawing No.: FIGURE 2	Revision No.: 0

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APPENDIX B

Well Construction Information

Community Well Owner	Address	Well No.	Map & UTM Zone	UTM Easting Northing	Date dd/mm/yyyy	Driller	Kind of Water Sampled?	Water Found At (m)	Depth & Casing Length (m)	SWL (m)	Test Yield L/min	Lithology & Depths to which Formation Extends / Final Status	Water Use
BARACHOIS BROOK MCMENAMON ED		10180	12B/8 21.00	394200 5368500	13/06/1982	4	FR N	37.00	37.40 37.70	9.10	164.00	GREY SAND 039 GREY SAND 040	DO
BARACHOIS BROOK WESTERN		10581	12B/8 21.00	393850 5366900	06/06/1984	4	FR N	32.00	30.70		46.00	WS GRVL 030 ROCK 031	IN
BARACHOIS BROOK WESTERN		11097	12B/8 21.00	393851 5366901	26/08/1984	4	FR N	26.00	26.20 26.20		114.00	WS BRWN GRVL 007 GREY GRVL 026	CO
BARACHOIS BROOK YOUNG, HILLIARD		10051	12B/8 21.00	392820 5366340	29/05/1980	3	FR N	28.00	29.80 28.00	18.30	0.00	WS BRWN FILL 001 GREY GRVL 029	DO
BARACHOIS BROOK	ROUTE 461	18947			20/05/1997	4			43.80 40.50		22.00	WS SAND CLAY SILT 44	DO
BARACHOIS POND BARACHOIS POND PARK		12461	12B/8 21.00	306300 5370450	18/11/1986	5	FR N	22.00	22.20 22.20		68.00	SAND 022	PS
BARACHOIS POND PROVINCIAL PARKS	BARACHOIS POND PARK	16186			29/11/1991	4	FR N	24.00	26.10 24.80	4.90	240.00	WS GREY SAND 024 GREY GRVL 026	PS
BARENEED ANDREWS, BILL		7956			22/02/1979		N		36.60 6.10		9.10	WS	
BARENEED ANDREWS, CLARENCE		7939			15/10/1973	6	N		42.70 11.30		0.00		
BARENEED ANDREWS, DON &	BOX 53, SITE 1, RR1, BARENEED	20752			20/06/2003	1	N		73.20 12.80		9.00	GRVL 1.8 BDRCK/ROCK GREN BRWN WHIT 73.2	DO
BARENEED ANDREWS, R.		7941			15/02/1973	6	N		67.10 9.40		9.10	DO	
BARENEED AVERY, BRUCE	BARENEED	17607			14/12/1994	1	FR N	36.60	42.70 11.90		13.50	DEEPENED - SEE BRWN GRVL 7 GREN ROCK 43	DO
BARENEED BALL, ROBERT		15075	22.00	330680 5270971	16/08/1990	1	FR N	30.00	39.60 6.70		14.00	WS GRVL 005 GREN ROCK 040	DO
BARENEED BARTLETT, HAZEL		7937					N		21.30	10.70	0.00	WS OBDN 012 ROCK 021	
BARENEED BARTLETT, JOHN		7944			15/06/1973	6	N		51.80 12.50		0.00		
BARENEED BATTEN, GARY		19862				1			79.30 19.20		4.50	GRVL 3 GREY ROCK 79	DO
BARENEED BATTEN, IVAN	BARENEED	17951			31/10/1995	2	FR N	49.00	54.90 12.80		9.00	TILL 9 ROCK 55	DO
BARENEED BATTEN, L.		7957			04/08/1979		N		82.30 6.70		9.10	WS	
BARENEED BATTEN, SARAH JANE	BARENEED	17387	22.00	331846 5271324	08/08/1994	1	FR N	51.80	51.80 6.40		1.50	GRVL 2 GREN WHIT ROCK 52	DO
BARENEED BISHOP, BAXTER		7940			15/03/1973	6	N		30.50 13.10		13.60	WS	
BARENEED BOONE, ANDREW	BLACK DUCK LANE	18638			13/10/1997	1			48.80 11.00		112.50	GRVL 7 GREY ROCK 49	DO
BARENEED BOONE, C.		7948			15/05/1965	6	N		12.20 12.20		0.00		
BARENEED BOONE, CYRIL		7938			15/05/1975	6	N		56.40 17.10		11.40		
BARENEED BOONE, RAY		7958			31/07/1979		N		67.10 6.10		18.20		
BARENEED BRADBURY, ANNIE	OTTERBURY ROAD	14736	22.00	331070 5271227	25/11/1989	2	FR N	61.00	62.50 13.40		9.00	GREY OBDN 013 BLUE ROCK 063	DO
BARENEED BROWN, PAUL		19923			08/07/2002	1	N		97.50 13.70		1.50	WS GRVL ROCK GREY ROCK GREY	DO
BARENEED BUFFETT FRED	BARNEED	16852	22.00	330443 5270781	06/03/1993	2	FR N	24.00	93.00 16.20		3.00	DO GREY TILL 14 GREY ROCK 93	DO
BARENEED BUSSEY, HARRY	BLACK DUCK POND ROAD, BARENEED	20324			16/09/2002	1	N		91.40 19.20		1.50	WS GRVL 15.2 BDRCK GREN 19.2 ROCK GREN 91.4	DO
BARENEED CLARENCE ANDREWS		18766			29/08/1997	2			103.60 8.30			DO TILL 3 GREY ROCK 104	DO
BARENEED CONCEPTION BAY		7953			15/06/1976	1	N		19.50 7.30		0.00		
BARENEED DAWE DAVID	BARENEED	17948			27/10/1995	2	FR N	49.00	67.10 11.60		5.00	TILL 9 ROCK 67	DO
BARENEED DAWE GUS		13699	22.00	330792 5271135	22/09/1987	1	FR N	48.00	79.30 7.90		4.00	WS BRWN CLAY 007 WHIT ROCK 079	DO
BARENEED DAWE TERRY		19498			15/09/2000	1			67.10 20.90		9.00	WS GRVL 18 ROCK 21 GREN WHIT ROCK 67	DO
BARENEED DAWE, JEAN	BARENEED	22442			20/11/2006	1	FR N		79.30 12.80		2.50	7.6 GRVL; 12.8 GREY BDRCK; 79.3 GREY ROCK	DO
BARENEED EFFORD JOHN		7950			15/08/1976	1	N		75.90 3.70		0.00		
BARENEED FISH PLANT		7946			15/05/1975	6	N		80.80 5.50		0.00		

APPENDIX C

Aquifer Test Data

Step-drawdown Test Data
Water Supply Well
Western Construction Property
Barachois Brook, NL

30-May-18
Start Time =

Well 1

Time (minutes)	Water Level (metres)	Drawdown (metres)	Flowrate L/min
0	14.70	0.00	11.4
0.25	14.91	0.21	
0.5	15.00	0.30	
0.75	15.04	0.34	
1	15.07	0.37	
1.5	15.09	0.39	
2	15.10	0.40	
2.5	15.10	0.40	
3	15.10	0.40	
3.5	15.09	0.39	
4	15.09	0.39	
4.5	15.10	0.40	
5	15.10	0.40	
6	15.10	0.40	
7	15.10	0.40	
8	15.10	0.40	
9	15.10	0.40	
10	15.10	0.40	
11	15.10	0.40	
12	15.10	0.40	
13	15.11	0.41	
14	15.11	0.41	
15	15.11	0.41	
20	15.11	0.41	
25	15.11	0.41	
30	15.11	0.41	
30.25	15.42	0.72	18.9
30.5	15.42	0.72	
30.75	15.42	0.72	
31	15.42	0.72	
31.5	15.43	0.73	
32	15.43	0.73	
32.5	15.43	0.73	
33	15.43	0.73	
33.5	15.43	0.73	
34	15.43	0.73	
34.5	15.43	0.73	

Step-drawdown Test Data
Water Supply Well
Western Construction Property
Barachois Brook, NL

30-May-18
Start Time =

Well 1

Time (minutes)	Water Level (metres)	Drawdown (metres)	Flowrate L/min
35	15.43	0.73	
36	15.43	0.73	
37	15.43	0.73	
38	15.43	0.73	
39	15.43	0.73	
40	15.43	0.73	
41	15.43	0.73	
42	15.42	0.72	
43	15.42	0.72	
44	15.42	0.72	
45	15.42	0.72	
50	15.42	0.72	
55	15.42	0.72	
60	15.42	0.72	
60.25	15.50	0.80	37.9
60.5	15.81	1.11	
60.75	15.96	1.26	
61	16.20	1.50	
61.5	16.39	1.69	
62	16.51	1.81	
62.5	16.59	1.89	
63	16.61	1.91	
63.5	16.62	1.92	
64	16.63	1.93	
64.5	16.64	1.94	
65	16.64	1.94	
66	16.64	1.94	
67	16.61	1.91	
68	16.57	1.87	
69	16.53	1.83	
70	16.50	1.80	
71	16.46	1.76	
72	16.47	1.77	
73	16.47	1.77	
74	16.47	1.77	
75	16.47	1.77	
80	16.49	1.79	

Step-drawdown Test Data
Water Supply Well
Western Construction Property
Barachois Brook, NL

30-May-18
Start Time =

Well 1

Time (minutes)	Water Level (metres)	Drawdown (metres)	Flowrate L/min
85	16.50	1.80	
90	16.50	1.80	
90.25	16.60	1.90	64.3
90.5	16.64	1.94	
90.75	17.15	2.45	
91	17.41	2.71	
91.5	17.79	3.09	
92	18.07	3.37	
92.5	18.26	3.56	
93	18.35	3.65	
93.5	18.45	3.75	
94	18.50	3.80	
94.5	18.57	3.87	
95	18.59	3.89	
96	18.63	3.93	
97	18.65	3.95	
98	18.67	3.97	
99	18.67	3.97	
100	18.67	3.97	
101	18.67	3.97	
102	18.68	3.98	
103	18.68	3.98	
104	18.68	3.98	
105	18.69	3.99	
110	18.70	4.00	
115	18.72	4.02	
120	18.75	4.05	

Constant Rate Test Data
Water Supply Well
Western Construction Property
Barachois Brook, NL

31-May-18
Start Time =

Pumping Rate = 64.4 L/min

Well 1

Time (minutes)	Water Level (metres)	Drawdown (metres)
0	14.700	0.000
0.25	15.800	1.100
0.5	16.400	1.700
0.75	16.840	2.140
1	17.160	2.460
1.5	17.640	2.940
2	17.830	3.130
2.5	18.000	3.300
3	18.140	3.440
3.5	18.210	3.510
4	18.290	3.590
4.5	18.340	3.640
5	18.360	3.660
6	18.410	3.710
7	18.440	3.740
8	18.465	3.765
9	18.490	3.790
10	18.510	3.810
11	18.528	3.828
12	18.546	3.846
13	18.554	3.854
14	18.565	3.865
15	18.572	3.872
20	18.605	3.905
25	18.640	3.940
30	18.670	3.970
35	18.704	4.004
40	18.732	4.032
45	18.749	4.049
50	18.756	4.056
55	18.760	4.060
60	18.769	4.069
75	18.788	4.088
90	18.797	4.097
105	18.800	4.100

Constant Rate Test Data
Water Supply Well
Western Construction Property
Barachois Brook, NL

31-May-18
Start Time =

Pumping Rate = 64.4 L/min

Well 1

Time (minutes)	Water Level (metres)	Drawdown (metres)
120	18.820	4.120
180	18.814	4.114
240	18.819	4.119
300	18.790	4.090
360	18.770	4.070
420	18.660	3.960
480	18.670	3.970
540	18.660	3.960
600	18.652	3.952
720	18.640	3.940
840	18.613	3.913
960	18.618	3.918
1080	18.620	3.920
1200	18.626	3.926
1320	18.624	3.924
1440	18.620	3.920

APPENDIX D

Plots of Aquifer Test Data

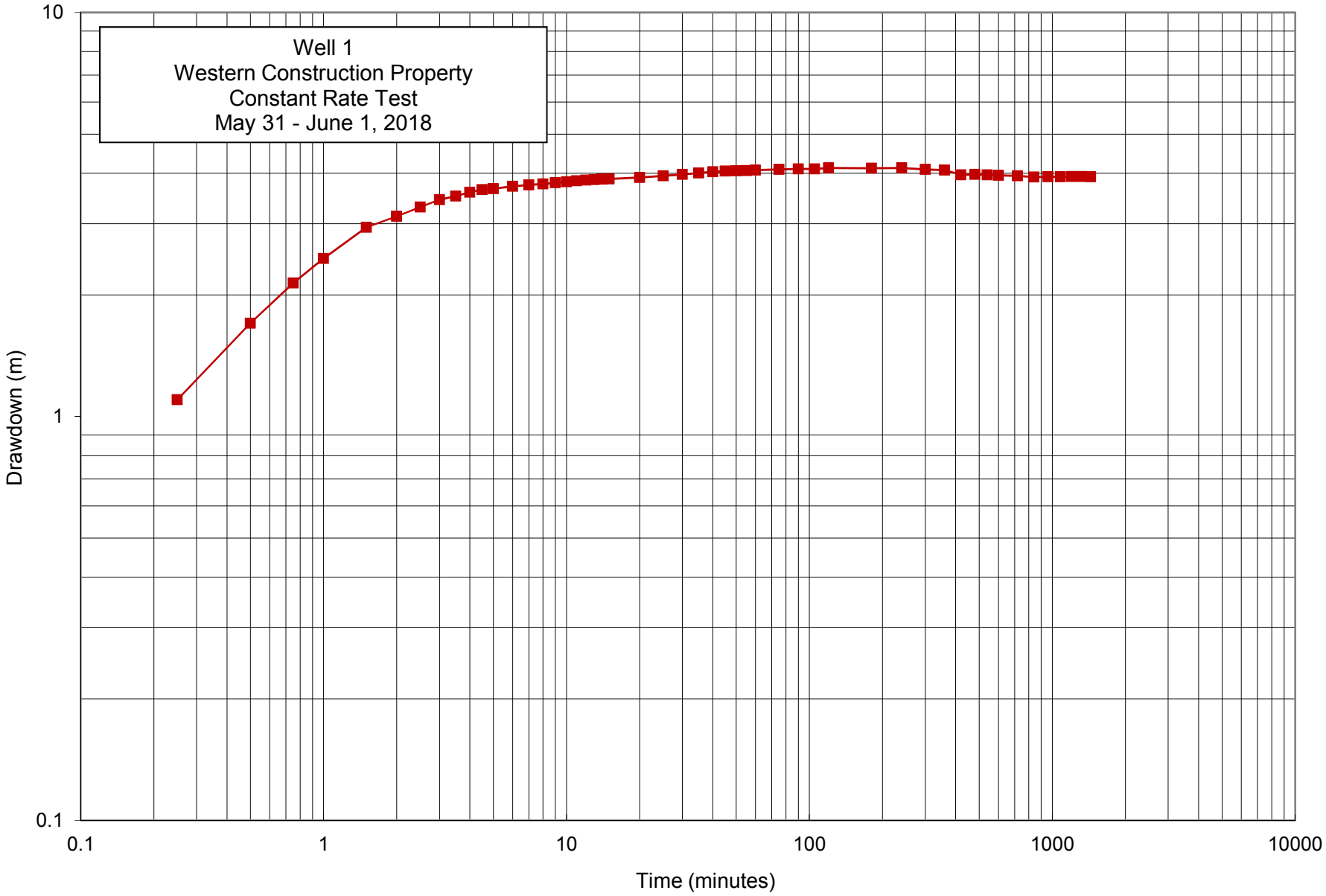


Figure D-3 Log-Log Plot of Drawdown Versus Time for Constant Rate Test

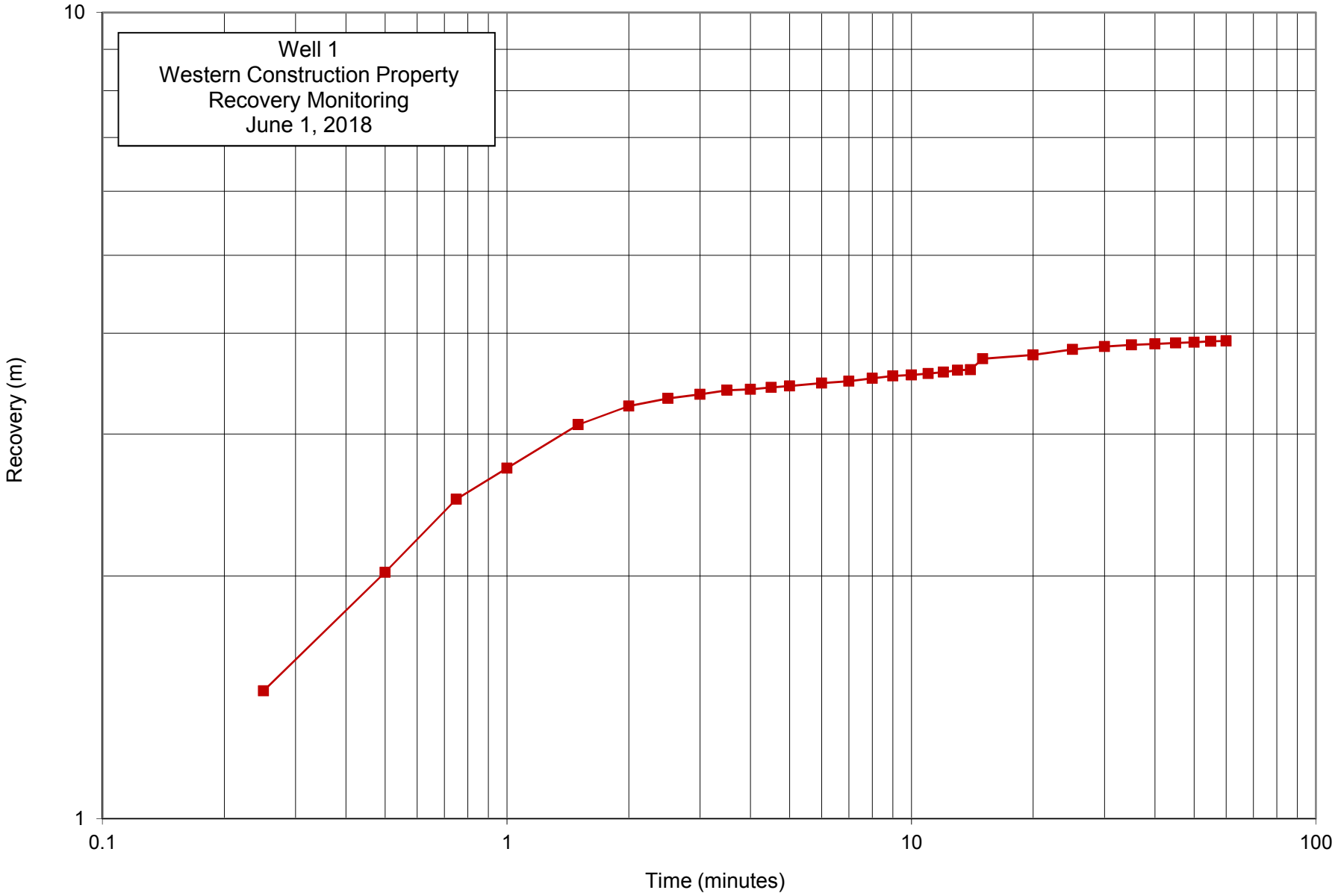


Figure D-4 Log-Log Plot of Water Level Recovery Versus Time for Constant Rate Test

APPENDIX E

Graphical Results of AQTESOLV® Analysis

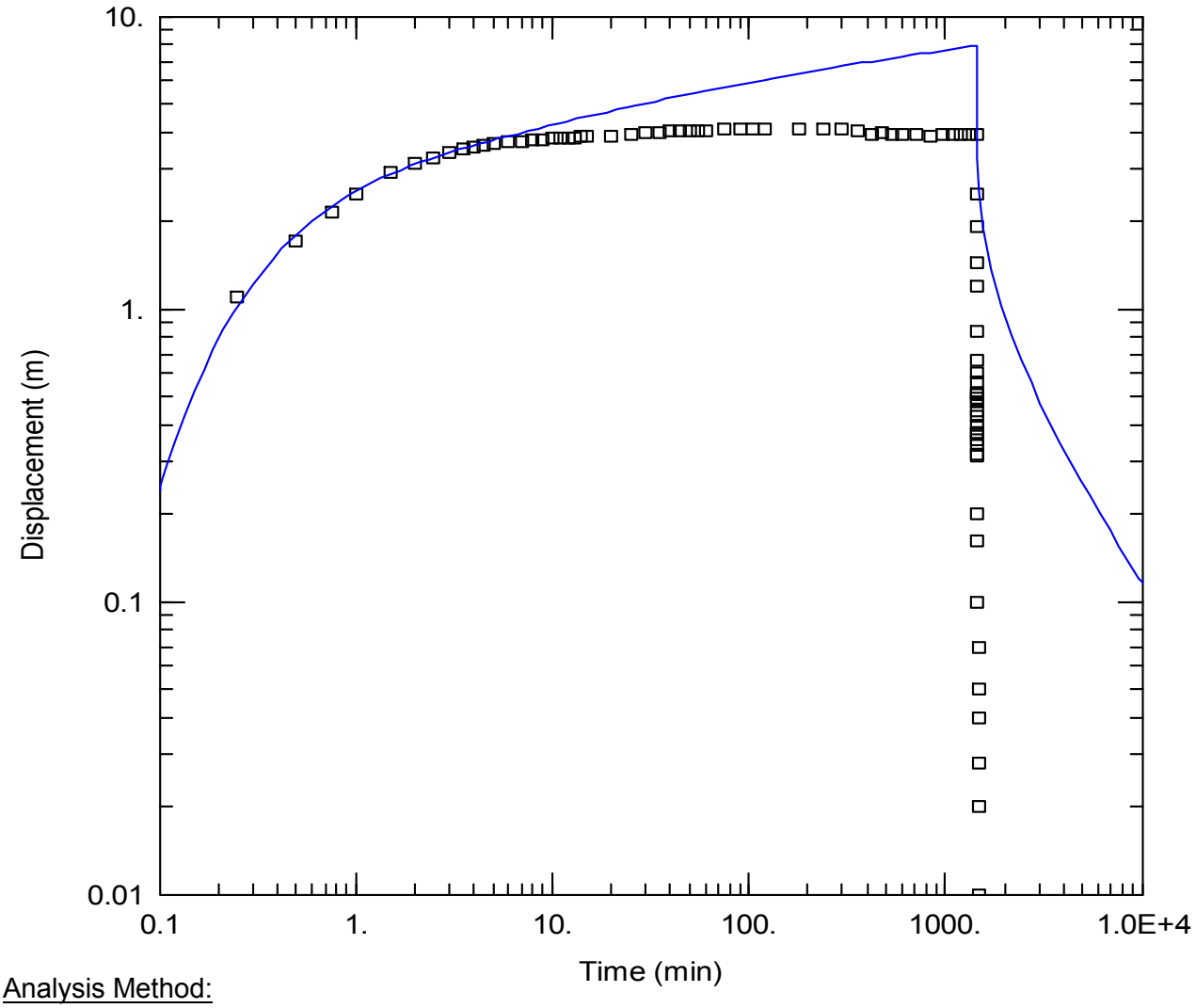
Report to: Northeast Well Drilling Company Ltd.
Project: 80033.05

GEMTEC Ltd.
10 Maverick Place,
Paradise, NL

Aquifer Test Analysis Report

Project: Aquifer Test Analysis, Water Well, Western Construction Property, Barachois Brook, NL (GEMTEC Project No. 80033.05)

Client: Northeast Well Drilling Ltd.



Analysis Method:

Neuman

Analysis Results:

Well Pumped and Rate:	Well 1 @ 64.4 L/min
Wells Analyzed	Well 1
Transmissivity:	1.15E-04 m^2/s
Storativity:	

Comments:

APPENDIX F

Laboratory Analytical Results & Laboratory Certificates of Analysis

Report to: Northeast Well Drilling Company Ltd.
Project: 80033.05

Table F.1 Results of Laboratory Analyses of General Chemistry in Water
Aquifer Test Analysis, Water Well, Western Construction Property
Barachois Brook, NL
GEMTEC Project No. 80033.05

Parameters	RDL	Units	Criteria[1]	Barachois Brook #1	Barachois Brook #2	17: WA0002219R
				31-May-18	01-Jun-18	04-Jun-18
Sodium	0.1	mg/L	200*	19.95	18.15	-
Potassium	0.08	mg/L	na	3.02	2.86	-
Calcium	0.4	mg/L	na	23.4	20	-
Magnesium	0.02	mg/L	na	4.85	4.3	-
Alkalinity	1.5	mg/L $CaC0_3$	na	84.1	69.8	-
Sulphate	0.015	mg/L	500*	15.108	11.572	-
Chloride	0.1	mg/L	250*	16.16	15.71	-
Bromide	0.05	mg/L	na	0.19	0.15	-
Fluoride	0.007	mg/L	1.5	0.031	0.028	-
Reactive Silica (SiO_2)	0.5	mg/L	na	-	-	-
Orthophosphate	0.05	mg/L P	na	nd	nd	-
Total Phosphorus	0.02	mg/L	na	0.042	0.034	-
Nitrate + Nitrite		mg/L N	na	0.015	0.072	-
Nitrate	0.005	mg/L N	10	nd	0.06	-
Nitrite	0.007	mg/L N	1	0.015	0.012	-
Ammonia	0.02	mg/L	na	0.04	0.03	-
Kjeldahl Nitrogen	0.1	mg/L	na	-	-	-
True Color	6	TCU	15*	nd	nd	-
Dissolved Organic Carbon	0.5	mg/L	na	-		-
Total Organic Carbon	0.6	mg/L	na	0.7	0.8	-
Turbidity	0.2	NTU	1[2]	4.99	3.19	-
Specific Conductance	0.3	µS/cm	na	261.9	199.6	-
pH	-	Units	7-10.5	8.61	8.62	-
Hardness		mg/L $CaC0_3$	na	78.3	67.67	-
Bicarbonate	1	mg/L $CaC0_3$	na	-	-	-
Carbonate	1	mg/L $CaC0_3$	na	-	-	-
Total Dissolved Solids	6	mg/L	500*	137	111	-
E. Coli	1	CFU	nd			Absent (nd)
Total Coliform	1	CFU	nd			Absent (nd)

Notes:

1 = Health Canada Guidelines for Canadian Drinking Water Quality (GCDWQ), February 2017

2 = Operational objective; to ensure effectiveness of disinfection and for good operation of the distribution system, it is recommended that that water entering the distribution system have turbidity levels of 1.0 NTU or less. Health Canada GCDWQ (2017)

RDL = Reportable Detection Limit

nd = Not detected above RDL

na = No applicable criteria

"-" = Not Analyzed

* = Aesthetic objective

"-" = Parameter not analyzed

Shaded/**bolded** = Value exceeds applicable criteria

Table F.2 Results of Laboratory Analyses of Trace Metals in Water
Aquifer Test Analysis, Water Well, Western Construction Property,
Barachois Brook, NL
GEMTEC Project No. 80033.05

Parameters	RDL	Units	Criteria[1]	Barachois Brook #1	Barachois Brook #2
Aluminum	0.003	ug/L	na	0.0061	0.0036
Antimony	0.003	ug/L	0.006	nd	nd
Arsenic	0.0005	ug/L	0.01	0.0040	0.0036
Barium	0.006	ug/L	1	0.0107	0.0089
Beryllium	0.0004	ug/L	na	nd	nd
Bismuth	0.0001	ug/L	na	nd	nd
Boron	0.004	ug/L	5	0.010742	0.010294
Cadmium	0.0002	ug/L	0.005	nd	nd
Chromium	0.0003	ug/L	0.05	0.0003	0.0007
Cobalt	0.0002	ug/L	na	nd	nd
Copper	0.0005	ug/L	1*	0.0016	0.0007
Iron	0.03	ug/L	0.3*	**0.46604**	0.134
Lead	0.0003	ug/L	0.01	nd	nd
Manganese	0.0003	ug/L	0.05*	**0.0758**	0.0385
Mercury	0.0002	ug/L	0.001	nd	nd
Molybdenum	0.002	ug/L	na	nd	nd
Nickel	0.0004	ug/L	na	nd	nd
Selenium	0.0008	ug/L	0.05	nd	nd
Silver	0.0006	ug/L	na	nd	nd
Strontium	0.0005	ug/L	na	0.1194	0.1047
Thallium	0.0002	ug/L	na	nd	nd
Tin	0.0004	ug/L	na	nd	nd
Titanium	0.00015	ug/L	na	0.01108	0.00974
Uranium	0.0001	ug/L	0.02	0.0002	0.0002
Vanadium	0.0002	ug/L	na	0.0031	0.0028
Zinc	0.01	ug/L	5*	nd	nd

Notes:
1 = Health Canada Guidelines for Canadian Drinking Water Quality, February 2017
RDL = Reportable Detection Limit
nd = Not detected above RDL
na = No applicable criteria
"-" = Not analyzed
* = Aesthetic objective
Shaded/**bolded** = Value exceeds applicable criteria

CERTIFICATE OF ANALYSIS

for

Avalon Laboratories
85C Bremigens Blvd
Paradise, NL
A1L 4A2
Canada

Ted Robinson
Northeast Well Drilling
407 Little Bay Road
Springdale, NL A0J 1T0
709-673-7286
northeastwelldrilling21@gmail.com

Received Date:	5-Jun-18
Report Date:	12-Jun-18
Project No.:	11293
Report ID:	WQ592
Arrival Temp (°C):	12.8

Analytes	Units	RDL	Analysis Date	Barachois Brook #1 May 31, 2018 @ 7:00AM W-0849-17	Canadian Drinking Water Guidelines Limit -	- - -	- - -
Alkalinity (as $CaCO_3$)	mg/L	1.5	11-Jun-18	84.1	-	-	-
Ammonia (as N)	mg/L	0.02	5-Jun-18	0.04	-	-	-
Conductivity	µS/cm	0.3	5-Jun-18	261.9	-	-	-
Colour (Apparent)	CU	6	5-Jun-18	< 6	≤ 15 CU (AO/OG)	-	-
pH	no unit	NA	5-Jun-18	8.61	6.8-8.5 (AO/OG)	-	-
TDS	mg/L	6	8-Jun-18	137	≤ 500 mg/L (AO/OG)	-	-
TOC (as C)	mg/L	0.6	6-Jun-18	0.7	-	-	-
Fluoride	mg/L	0.007	10-Jun-18	0.031	1.5 mg/L	-	-
Chloride	mg/L	0.10	10-Jun-18	16.16	≤ 250 mg/L (AO/OG)	-	-
Nitrite (as N)	mg/L	0.007	10-Jun-18	0.015	1 mg/L	-	-
Bromide	mg/L	0.05	10-Jun-18	0.19	-	-	-
Nitrate (as N)	mg/L	0.005	10-Jun-18	< 0.005	10 mg/L	-	-
o-Phosphate	mg/L	0.05	10-Jun-18	< 0.05	-	-	-
Sulfate	mg/L	0.015	10-Jun-18	15.108	≤ 500 mg/L (AO/OG)	-	-
Nitrate + Nitrite (as N)	mg/L		10-Jun-18	0.015	-	-	-
Turbidity	NTU	0.20	5-Jun-18	4.99	-	-	-

Analytes	Units	RDL	Analysis Date	Barachois Brook #1 May 31, 2018 @ 7:00AM W-0849-17	Canadian Drinking Water Guidelines Limit -	- - -	- - -
Beryllium	µg/L	0.4	6-Jun-18	< 0.4	-	-	-
Boron	µg/L	4	6-Jun-18	10.742	5000 µg/L	-	-
Sodium	mg/L	0.1	6-Jun-18	19.95	≤ 200 mg/L (AO/OG)	-	-
Magnesium	mg/L	0.02	6-Jun-18	4.85	-	-	-
Aluminum	µg/L	3.0	6-Jun-18	6.1	≤ 100 µg/L (AO/OG)	-	-
Phosphorus	mg/L	0.020	6-Jun-18	0.042	-	-	-
Potassium	mg/L	0.08	6-Jun-18	3.02	-	-	-
Calcium	mg/L	0.4	6-Jun-18	23.4	-	-	-
Titanium	µg/L	0.15	6-Jun-18	11.08	-	-	-
Vanadium	µg/L	0.2	6-Jun-18	3.1	-	-	-
Chromium	µg/L	0.3	6-Jun-18	0.3	50 µg/L	-	-
Manganese	µg/L	0.3	6-Jun-18	75.8	≤ 50 µg/L (AO/OG)	-	-
Iron	µg/L	30	6-Jun-18	466.04	≤ 300 µg/L (AO/OG)	-	-
Cobalt	µg/L	0.2	6-Jun-18	< 0.2	-	-	-
Nickel	µg/L	0.4	6-Jun-18	< 0.4	-	-	-
Copper	µg/L	0.5	6-Jun-18	1.6	≤ 1000 µg/L (AO/OG)	-	-
Zinc	µg/L	10.0	6-Jun-18	< 10	≤ 5000 µg/L (AO/OG)	-	-
Arsenic	µg/L	0.5	6-Jun-18	4.0	10 µg/L	-	-
Selenium	µg/L	0.8	6-Jun-18	< 0.8	50 µg/L	-	-
Strontium	µg/L	0.5	6-Jun-18	119.4	-	-	-
Molybdenum	µg/L	2.0	6-Jun-18	< 2	-	-	-
Silver	µg/L	0.6	6-Jun-18	< 0.6	-	-	-
Cadmium	µg/L	0.2	6-Jun-18	< 0.2	5 µg/L	-	-
Tin	µg/L	0.4	6-Jun-18	< 0.4	-	-	-
Antimony	µg/L	3.0	6-Jun-18	< 3	6 µg/L	-	-
Barium	µg/L	6.0	6-Jun-18	10.7	1000 µg/L	-	-
Mercury	µg/L	0.2	6-Jun-18	< 0.2	1 µg/L	-	-
Thallium	µg/L	0.2	6-Jun-18	< 0.2	-	-	-
Lead	µg/L	0.3	6-Jun-18	< 0.3	10 µg/L	-	-
Bismuth	µg/L	0.1	6-Jun-18	< 0.1	-	-	-
Uranium	µg/L	0.1	6-Jun-18	0.2	20 µg/L	-	-

METHODS

Analyte	Laboratory Method ID	Reference Method ID
Alkalinity	SOP 15050	modified SM 2320 B
Ammonia (as N)	SOP 15061	modified EPA 350.1
Conductivity	SOP 15057	SM 2510B
pH	SOP 15060	modified SM 4500-H+ B
Colour (Apparent)	SOP 15058	modified SM 2120 C
TDS	SOP 15056	modified SM 2540 C
TOC	SOP 15064	modified SM 5310 B
Anions	SOP 15038	modified SM 4110 B
Metals	SOP 15036	modified EPA 200.8
Turbidity	SOP 15054	modified EPA 180.1

Acronyms
AO/OG - Canadian Drinking Water Guidelines Aesthetic Objective/Operational Guideline
RDL - Reporting Detection Limit
NC - Not Calculable

Calculated Parameters	
Cation Sum (meq/L)	2.54
Anion Sum (meq/L)	2.46
Ion Balance	1.77
Hardness (mg/L of $CaCO_3$)	78.30
Saturation pH @ 4°C	8.66
Langelier Index @ 4°C	-0.05
Saturation pH @ 20°C	8.26
Langelier Index @ 20°C	0.35

Comments:

Technical Reviewer

Senior Reviewer

QA/QC REPORT

METALS

Analyte	RDL	Method Blank	Reference Material Measured Recovery	Criteria (%)	Lab Fortified Blank Measured Recovery	Criteria (%)	Matrix Spike Measured Recovery	Criteria* (%)	Duplicates		RPD	Criteria (%)
									No 1	No 2		
Beryllium (µg/L)	0.4	< 0.4	100.170 (100.2%)	90-110	100.6	85-115	107.1	70-130	107.9	106.3	1.5	≤ 10
Boron (µg/L)	4	< 4	99.798 (99.8%)	90-110	102.3	85-115	104.6	70-130	133.2	131.9	1.0	≤ 10
Sodium (mg/L)	0.1	< 0.1	20.311 (101.6%)	90-110	102.6	85-115	101.3	70-130	151.6	149.2	1.6	≤ 10
Magnesium (mg/L)	0.02	< 0.02	20.183 (100.9%)	90-110	101.6	85-115	101.2	70-130	28.8	28.4	1.2	≤ 10
Aluminum (µg/L)	3.0	< 3	100.440 (100.4%)	90-110	101.6	85-115	103.3	70-130	284.5	279.5	1.8	≤ 10
Phosphorus (mg/L)	0.020	< 0.02	20.413 (102.1%)	90-110	102.9	85-115	112.8	70-130	22.6	22.2	1.7	≤ 10
Potassium (mg/L)	0.08	< 0.08	20.466 (102.3%)	90-110	102.9	85-115	100.9	70-130	23.5	23.2	1.6	≤ 10
Calcium (mg/L)	0.4	< 0.4	20.490 (102.5%)	90-110	102.5	85-115	100.8	70-130	41.9	41.2	1.7	≤ 10
Titanium (µg/L)	0.15	< 0.15	99.084 (99.1%)	90-110	102.1	85-115	112.8	70-130	104.6	104.9	0.2	≤ 10
Vanadium (µg/L)	0.2	< 0.2	100.514 (100.5%)	90-110	102.9	85-115	96.1	70-130	96.2	95.5	0.7	≤ 10
Chromium (µg/L)	0.3	< 0.3	100.687 (100.7%)	90-110	102.5	85-115	93.2	70-130	93.6	92.7	0.9	≤ 10
Manganese (µg/L)	0.3	< 0.3	100.420 (100.4%)	90-110	101.7	85-115	78.6	70-130	795.5	785.8	1.2	≤ 10
Iron (µg/L)	30	< 30	100.551 (100.6%)	90-110	102.2	85-115	97.3	70-130	120.1	119.1	0.8	≤ 10
Cobalt (µg/L)	0.2	< 0.2	101.550 (101.5%)	90-110	101.4	85-115	100.1	70-130	105.6	104.3	1.2	≤ 10
Nickel (µg/L)	0.4	< 0.4	99.470 (99.5%)	90-110	100.3	85-115	97.9	70-130	100.4	99.4	1.0	≤ 10
Copper (µg/L)	0.5	< 0.5	100.180 (100.2%)	90-110	101.1	85-115	97.6	70-130	116.7	115.9	0.7	≤ 10
Zinc (µg/L)	10.0	< 10	100.117 (100.1%)	90-110	101.8	85-115	103.1	70-130	165.0	165.6	0.4	≤ 10
Arsenic (µg/L)	0.5	< 0.5	101.611 (101.6%)	90-110	102.2	85-115	111.6	70-130	111.7	111.9	0.1	≤ 10
Selenium (µg/L)	0.8	< 0.8	507.595 (101.5%)	90-110	102.8	85-115	117.2	70-130	586.5	585.2	0.2	≤ 10
Strontium (µg/L)	0.5	< 0.5	100.781 (100.8%)	90-110	102.1	85-115	105.6	70-130	202.3	200.7	0.8	≤ 10
Molybdenum (µg/L)	2.0	< 2	96.401 (96.4%)	90-110	101.7	85-115	101.1	70-130	101.7	103.7	2.0	≤ 10
Silver (µg/L)	0.6	< 0.6	101.657 (101.7%)	90-110	102.8	85-115	84.7	70-130	84.7	83.7	1.2	≤ 10
Cadmium (µg/L)	0.2	< 0.2	100.343 (100.3%)	90-110	101.5	85-115	104.9	70-130	105.2	105.0	0.2	≤ 10
Tin (µg/L)	0.4	< 0.4	99.253 (99.3%)	90-110	101.2	85-115	99.0	70-130	99.0	99.1	0.1	≤ 10
Antimony (µg/L)	3.0	< 3	98.221 (98.2%)	90-110	101.6	85-115	106.4	70-130	106.5	106.1	0.4	≤ 10
Barium (µg/L)	6.0	< 6	100.290 (100.3%)	90-110	102.0	85-115	101.0	70-130	216.9	214.8	1.0	≤ 10
Mercury (µg/L)	0.2	< 0.2	5.027 (100.5%)	90-110	101.4	85-115	101.7	70-130	5.2	5.2	0.6	≤ 10
Thallium (µg/L)	0.2	< 0.2	101.364 (101.4%)	90-110	102.1	85-115	96.1	70-130	96.1	95.5	0.7	≤ 10
Lead (µg/L)	0.3	< 0.3	101.747 (101.7%)	90-110	102.5	85-115	97.0	70-130	100.0	99.2	0.7	≤ 10
Bismuth (µg/L)	0.1	< 0.1	100.951 (101.0%)	90-110	102.3	85-115	92.6	70-130	92.6	92.5	0.1	≤ 10
Uranium (µg/L)	0.1	< 0.1	100.764 (100.8%)	90-110	102.2	85-115	101.8	70-130	101.9	101.1	0.7	≤ 10

QA/QC REPORT

ANIONS

Analyte	RDL	Reference Material Measured Recovery	Criteria (%)
Fluoride (mg/L)	0.007	91.2	90-110
Chloride (mg/L)	0.10	100.7	90-110
Nitrite (mg/L)	0.023	104.2	90-110
Bromide (mg/L)	0.05	101.6	90-110
Nitrate (mg/L)	0.021	99.8	90-110
o-Phosphate (mg/L)	0.05	91.2	90-110
Sulfate (mg/L)	0.015	99.3	90-110

QA/QC REPORT

INORGANIC ANALYSIS

Analysis	RDL	Method Blank	Reference Material Measured Recovery	Criteria (%)	Lab Fortified Blank Measured Recovery	Criteria (%)	Matrix Spike Measured Recovery	Criteria (%)	Duplicates		RPD	Criteria (%)
									No 1	No 2		
Alkalinity (mg/L)	1.5	< 5	-	90-110	100.3	90-110	-	NA	84.08	82.29	2.2	≤ 20
TDS (mg/L)	6.0	-	-	NA	101	80-120	-	NA	137	129	6	≤ 15
Conductivity (µS/cm)	0.3	-	-	90-110	100.5	90-110	-	NA	261.9	254.2	2.9	≤ 5
pH	NA	-	-	NA	-	NA	-	NA	8.61	8.57	0.5	≤ 1
Colour (Apparent) (CU)	6.0	-	-	NA	103.6	90-110	-	NA	< 6	< 6	NC	≤ 20
Ammonia (mg/L)	0.02	< 0.01	101	90-110	102	80-120	117	70-130	-	-	-	NA
TOC (mg/L)	0.6	< 0.3	96.25	90-110	94.55	90-110	98.13	70-130	2.1	2.129	1.37	≤ 10
Turbidity (NTU)	0.2	-	95.5	90-110	92.5	90-110	-	NA	0.89	0.84	5.8	≤ 20

CERTIFICATE OF ANALYSIS

for

Avalon Laboratories
85C Bremigens Blvd
Paradise, NL
A1L 4A2
Canada

Ted Robinson
Northeast Well Drilling
407 Little Bay Road
Springdale, NL A0J 1T0
709-673-7286
northeastwelldrilling21@gmail.com

Received Date:	5-Jun-18
Report Date:	12-Jun-18
Project No.:	11293
Report ID:	WQ593
Arrival Temp (°C):	13.3

Analytes	Units	RDL	Analysis Date	Barachois Brook #2 June 1, 2018 @ 7:00AM W-0850-17	Canadian Drinking Water Guidelines Limit -	- - -	- - -
Alkalinity (as $CaCO_3$)	mg/L	1.5	11-Jun-18	69.8	-	-	-
Ammonia (as N)	mg/L	0.02	5-Jun-18	0.03	-	-	-
Conductivity	µS/cm	0.3	5-Jun-18	199.6	-	-	-
Colour (Apparent)	CU	6	5-Jun-18	< 6	≤ 15 CU (AO/OG)	-	-
pH	no unit	NA	5-Jun-18	8.62	6.8-8.5 (AO/OG)	-	-
TDS	mg/L	6	8-Jun-18	111	≤ 500 mg/L (AO/OG)	-	-
TOC (as C)	mg/L	0.6	6-Jun-18	0.8	-	-	-
Fluoride	mg/L	0.007	10-Jun-18	0.028	1.5 mg/L	-	-
Chloride	mg/L	0.10	10-Jun-18	15.71	≤ 250 mg/L (AO/OG)	-	-
Nitrite (as N)	mg/L	0.007	10-Jun-18	0.012	1 mg/L	-	-
Bromide	mg/L	0.05	10-Jun-18	0.15	-	-	-
Nitrate (as N)	mg/L	0.005	10-Jun-18	0.060	10 mg/L	-	-
o-Phosphate	mg/L	0.05	10-Jun-18	< 0.05	-	-	-
Sulfate	mg/L	0.015	10-Jun-18	11.572	≤ 500 mg/L (AO/OG)	-	-
Nitrate + Nitrite (as N)	mg/L		10-Jun-18	0.072	-	-	-
Turbidity	NTU	0.20	5-Jun-18	3.19	-	-	-

Analytes	Units	RDL	Analysis Date	Barachois Brook #2 June 1, 2018 @ 7:00AM W-0850-17	Canadian Drinking Water Guidelines Limit -	- - -	- - -
Beryllium	µg/L	0.4	6-Jun-18	< 0.4	-	-	-
Boron	µg/L	4	6-Jun-18	10.294	5000 µg/L	-	-
Sodium	mg/L	0.1	6-Jun-18	18.15	≤ 200 mg/L (AO/OG)	-	-
Magnesium	mg/L	0.02	6-Jun-18	4.30	-	-	-
Aluminum	µg/L	3.0	6-Jun-18	3.6	≤ 100 µg/L (AO/OG)	-	-
Phosphorus	mg/L	0.020	6-Jun-18	0.034	-	-	-
Potassium	mg/L	0.08	6-Jun-18	2.86	-	-	-
Calcium	mg/L	0.4	6-Jun-18	20.0	-	-	-
Titanium	µg/L	0.15	6-Jun-18	9.74	-	-	-
Vanadium	µg/L	0.2	6-Jun-18	2.8	-	-	-
Chromium	µg/L	0.3	6-Jun-18	0.7	50 µg/L	-	-
Manganese	µg/L	0.3	6-Jun-18	38.5	≤ 50 µg/L (AO/OG)	-	-
Iron	µg/L	30	6-Jun-18	134.00	≤ 300 µg/L (AO/OG)	-	-
Cobalt	µg/L	0.2	6-Jun-18	< 0.2	-	-	-
Nickel	µg/L	0.4	6-Jun-18	< 0.4	-	-	-
Copper	µg/L	0.5	6-Jun-18	0.7	≤ 1000 µg/L (AO/OG)	-	-
Zinc	µg/L	10.0	6-Jun-18	< 10	≤ 5000 µg/L (AO/OG)	-	-
Arsenic	µg/L	0.5	6-Jun-18	3.6	10 µg/L	-	-
Selenium	µg/L	0.8	6-Jun-18	< 0.8	50 µg/L	-	-
Strontium	µg/L	0.5	6-Jun-18	104.7	-	-	-
Molybdenum	µg/L	2.0	6-Jun-18	< 2	-	-	-
Silver	µg/L	0.6	6-Jun-18	< 0.6	-	-	-
Cadmium	µg/L	0.2	6-Jun-18	< 0.2	5 µg/L	-	-
Tin	µg/L	0.4	6-Jun-18	< 0.4	-	-	-
Antimony	µg/L	3.0	6-Jun-18	< 3	6 µg/L	-	-
Barium	µg/L	6.0	6-Jun-18	8.9	1000 µg/L	-	-
Mercury	µg/L	0.2	6-Jun-18	< 0.2	1 µg/L	-	-
Thallium	µg/L	0.2	6-Jun-18	< 0.2	-	-	-
Lead	µg/L	0.3	6-Jun-18	< 0.3	10 µg/L	-	-
Bismuth	µg/L	0.1	6-Jun-18	< 0.1	-	-	-
Uranium	µg/L	0.1	6-Jun-18	0.2	20 µg/L	-	-

METHODS

Analyte	Laboratory Method ID	Reference Method ID
Alkalinity	SOP 15050	modified SM 2320 B
Ammonia (as N)	SOP 15061	modified EPA 350.1
Conductivity	SOP 15057	SM 2510B
pH	SOP 15060	modified SM 4500-H+ B
Colour (Apparent)	SOP 15058	modified SM 2120 C
TDS	SOP 15056	modified SM 2540 C
TOC	SOP 15064	modified SM 5310 B
Anions	SOP 15038	modified SM 4110 B
Metals	SOP 15036	modified EPA 200.8
Turbidity	SOP 15054	modified EPA 180.1

Acronyms
AO/OG - Canadian Drinking Water Guidelines Aesthetic Objective/Operational Guideline
RDL - Reporting Detection Limit
NC - Not Calculable

Calculated Parameters	
Cation Sum (meq/L)	2.23
Anion Sum (meq/L)	2.09
Ion Balance	3.41
Hardness (mg/L of $CaCO_3$)	67.67
Saturation pH @ 4°C	8.79
Langelier Index @ 4°C	-0.17
Saturation pH @ 20°C	8.40
Langelier Index @ 20°C	0.22

Comments:

Technical Reviewer

Senior Reviewer

QA/QC REPORT

METALS

Analyte	RDL	Method Blank	Reference Material Measured Recovery	Criteria (%)	Lab Fortified Blank Measured Recovery	Criteria (%)	Matrix Spike Measured Recovery	Criteria* (%)	Duplicates		RPD	Criteria (%)
									No 1	No 2		
Beryllium (µg/L)	0.4	< 0.4	100.170 (100.2%)	90-110	100.6	85-115	107.1	70-130	107.9	106.3	1.5	≤ 10
Boron (µg/L)	4	< 4	99.798 (99.8%)	90-110	102.3	85-115	104.6	70-130	133.2	131.9	1.0	≤ 10
Sodium (mg/L)	0.1	< 0.1	20.311 (101.6%)	90-110	102.6	85-115	101.3	70-130	151.6	149.2	1.6	≤ 10
Magnesium (mg/L)	0.02	< 0.02	20.183 (100.9%)	90-110	101.6	85-115	101.2	70-130	28.8	28.4	1.2	≤ 10
Aluminum (µg/L)	3.0	< 3	100.440 (100.4%)	90-110	101.6	85-115	103.3	70-130	284.5	279.5	1.8	≤ 10
Phosphorus (mg/L)	0.020	< 0.02	20.413 (102.1%)	90-110	102.9	85-115	112.8	70-130	22.6	22.2	1.7	≤ 10
Potassium (mg/L)	0.08	< 0.08	20.466 (102.3%)	90-110	102.9	85-115	100.9	70-130	23.5	23.2	1.6	≤ 10
Calcium (mg/L)	0.4	< 0.4	20.490 (102.5%)	90-110	102.5	85-115	100.8	70-130	41.9	41.2	1.7	≤ 10
Titanium (µg/L)	0.15	< 0.15	99.084 (99.1%)	90-110	102.1	85-115	112.8	70-130	104.6	104.9	0.2	≤ 10
Vanadium (µg/L)	0.2	< 0.2	100.514 (100.5%)	90-110	102.9	85-115	96.1	70-130	96.2	95.5	0.7	≤ 10
Chromium (µg/L)	0.3	< 0.3	100.687 (100.7%)	90-110	102.5	85-115	93.2	70-130	93.6	92.7	0.9	≤ 10
Manganese (µg/L)	0.3	< 0.3	100.420 (100.4%)	90-110	101.7	85-115	78.6	70-130	795.5	785.8	1.2	≤ 10
Iron (µg/L)	30	< 30	100.551 (100.6%)	90-110	102.2	85-115	97.3	70-130	120.1	119.1	0.8	≤ 10
Cobalt (µg/L)	0.2	< 0.2	101.550 (101.5%)	90-110	101.4	85-115	100.1	70-130	105.6	104.3	1.2	≤ 10
Nickel (µg/L)	0.4	< 0.4	99.470 (99.5%)	90-110	100.3	85-115	97.9	70-130	100.4	99.4	1.0	≤ 10
Copper (µg/L)	0.5	< 0.5	100.180 (100.2%)	90-110	101.1	85-115	97.6	70-130	116.7	115.9	0.7	≤ 10
Zinc (µg/L)	10.0	< 10	100.117 (100.1%)	90-110	101.8	85-115	103.1	70-130	165.0	165.6	0.4	≤ 10
Arsenic (µg/L)	0.5	< 0.5	101.611 (101.6%)	90-110	102.2	85-115	111.6	70-130	111.7	111.9	0.1	≤ 10
Selenium (µg/L)	0.8	< 0.8	507.595 (101.5%)	90-110	102.8	85-115	117.2	70-130	586.5	585.2	0.2	≤ 10
Strontium (µg/L)	0.5	< 0.5	100.781 (100.8%)	90-110	102.1	85-115	105.6	70-130	202.3	200.7	0.8	≤ 10
Molybdenum (µg/L)	2.0	< 2	96.401 (96.4%)	90-110	101.7	85-115	101.1	70-130	101.7	103.7	2.0	≤ 10
Silver (µg/L)	0.6	< 0.6	101.657 (101.7%)	90-110	102.8	85-115	84.7	70-130	84.7	83.7	1.2	≤ 10
Cadmium (µg/L)	0.2	< 0.2	100.343 (100.3%)	90-110	101.5	85-115	104.9	70-130	105.2	105.0	0.2	≤ 10
Tin (µg/L)	0.4	< 0.4	99.253 (99.3%)	90-110	101.2	85-115	99.0	70-130	99.0	99.1	0.1	≤ 10
Antimony (µg/L)	3.0	< 3	98.221 (98.2%)	90-110	101.6	85-115	106.4	70-130	106.5	106.1	0.4	≤ 10
Barium (µg/L)	6.0	< 6	100.290 (100.3%)	90-110	102.0	85-115	101.0	70-130	216.9	214.8	1.0	≤ 10
Mercury (µg/L)	0.2	< 0.2	5.027 (100.5%)	90-110	101.4	85-115	101.7	70-130	5.2	5.2	0.6	≤ 10
Thallium (µg/L)	0.2	< 0.2	101.364 (101.4%)	90-110	102.1	85-115	96.1	70-130	96.1	95.5	0.7	≤ 10
Lead (µg/L)	0.3	< 0.3	101.747 (101.7%)	90-110	102.5	85-115	97.0	70-130	100.0	99.2	0.7	≤ 10
Bismuth (µg/L)	0.1	< 0.1	100.951 (101.0%)	90-110	102.3	85-115	92.6	70-130	92.6	92.5	0.1	≤ 10
Uranium (µg/L)	0.1	< 0.1	100.764 (100.8%)	90-110	102.2	85-115	101.8	70-130	101.9	101.1	0.7	≤ 10

QA/QC REPORT

ANIONS

Analyte	RDL	Reference Material Measured Recovery	Criteria (%)
Fluoride (mg/L)	0.007	91.2	90-110
Chloride (mg/L)	0.10	100.7	90-110
Nitrite (mg/L)	0.023	104.2	90-110
Bromide (mg/L)	0.05	101.6	90-110
Nitrate (mg/L)	0.021	99.8	90-110
o-Phosphate (mg/L)	0.05	91.2	90-110
Sulfate (mg/L)	0.015	99.3	90-110

QA/QC REPORT

INORGANIC ANALYSIS

Analysis	RDL	Method Blank	Reference Material Measured Recovery	Criteria (%)	Lab Fortified Blank Measured Recovery	Criteria (%)	Matrix Spike Measured Recovery	Criteria (%)	Duplicates		RPD	Criteria (%)
									No 1	No 2		
Alkalinity (mg/L)	1.5	< 5	-	90-110	100.3	90-110	-	NA	84.08	82.29	2.2	≤ 20
TDS (mg/L)	6.0	-	-	NA	101	80-120	-	NA	137	129	6	≤ 15
Conductivity (µS/cm)	0.3	-	-	90-110	100.5	90-110	-	NA	261.9	254.2	2.9	≤ 5
pH	NA	-	-	NA	-	NA	-	NA	8.61	8.57	0.5	≤ 1
Colour (Apparent) (CU)	6.0	-	-	NA	103.6	90-110	-	NA	< 6	< 6	NC	≤ 20
Ammonia (mg/L)	0.02	< 0.01	101	90-110	102	80-120	117	70-130	-	-	-	NA
TOC (mg/L)	0.6	< 0.3	96.25	90-110	94.55	90-110	98.13	70-130	2.1	2.129	1.37	≤ 10
Turbidity (NTU)	0.2	-	95.5	90-110	92.5	90-110	-	NA	0.89	0.84	5.8	≤ 20

Grand Falls-Windsor NL, A2A 2E1
709-292-2580
Laboratory Results

RUN DATE: 05/06/18
RUN TIME: 1631

PAGE 1

Name: PW,NORTHEAST WELL DRILLING

Report For: GOVERNMENT SERVICE CENTRE-GFW

Specimen: 18:WA0002219R Collected: 04/06/18-0700 Collected By: CBT
Received: 04/06/18-1340 Source: DRINKING WATER

SAMPLING SITE: DRILLED WELL/BIRD CONSTRUCTION
REPORT TO: BARACHOS BROOK,NL
GSC
GFW

Procedure	Result	Site
BACTERIOLOGICAL WATER ANALYSIS	Final	
TOTAL COLIFORMS	ABSENT	
FECAL COLIFORM (E.COLI)	ABSENT	

Total Coliform absent
Fecal Coliform (E.coli) absent

☐ Particulate matter
☐ Overgrowth bacteria
☐ Not Tested

Newfoundland Labrador

Service NL
Government Service Centre
Grand Falls-Windsor Office
292-4206

INTERPRETATION OF WATER TEST RESULTS:
☑ Satisfactory ☐ Sub-standard
☐ Unsatisfactory ☐ Unable to interpret
Comments:

June 6/18
Date

Environmental Health Officer

experience • knowledge • integrity

civil	civil
geotechnical	géotechnique
environmental	environnementale
field services	surveillance de chantier
materials testing	service de laboratoire des matériaux

expérience • connaissance • intégrité

Appendix H
Site Photographs

Photo 1 – 2016 aerial drone view looking toward Site across Main Road (provided by Back Home Grow).

Photo 2 – 2018 aerial drone view looking down on western side of Site while being used as laydown yard for Maritime Link Project (provided by Back Home Grow).

Photo 3 – View, looking west, toward Warehouse (former Repair Shop) on March 19, 2019 (provided by Back Home Grow).

Photo 4 – View, looking west, toward Warehouse (former Repair Shop) and across former laydown yard with miscellaneous debris at left of photograph (provided by Back Home Grow).

Site Photographs

Photo 5 – View, looking southwest, toward Warehouse (former Repair Shop) and Main Office (provided by Back Home Grow).

Photo 6 – View, looking west, toward Warehouse (former Repair Shop) with miscellaneous debris at centre of the photograph (provided by Back Home Grow).

Site Photographs

Photo 7 – View, looking east, across former laydown yard with miscellaneous debris at centre left of photograph with bus parking area off site on the former airstrip (provided by Back Home Grow).

about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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