

Phase Two Environmental Site Assessment

6302 and 6314 Ninth Line (Parcels E and F)

Mississauga, Ontario

Prepared For:

Derry Britannia Developments Limited

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Vaughan, Ontario

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DS Project No: 18-692-100

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1.0 Executive Summary

DS Consultants Ltd. (DS) was retained by Derry Britannia Developments Limited (the “Client”) to conduct a Phase Two Environmental Site Assessment (ESA) of the Properties located at 6302 and 6314 Ninth Line (Parcels E and F), Mississauga, Ontario, herein referred to as the “Phase Two Property”. The Phase Two Property is a 2.28-hectare (6.98 acres) parcel of land situated within a mixed residential, agricultural, and commercial neighborhood in the City of Mississauga, Ontario. The Phase Two Property is located approximately 190 m north of the intersection of Ninth Line and Foxwood Avenue.

Parcel E was historically used as an agricultural field from the mid-1950s to the mid-1960s, until it was repurposed as a vehicle storage facility and residential premises in the early 1990s. One single-story residential building with a basement (Site Building H), constructed in the mid-1960s, located on the eastern portion of the parcel along Ninth Line is currently located on the property. An aluminum drive-shed with one garage door, constructed circa 1985 (Site Building I), is located behind the residential building. Two wooden storage sheds line the southern portion of the property (Site Buildings J and K). Several shipping containers used for storage were observed on the eastern side of the property. Parcel E is surrounded by Parcel F on the south and west sides.

Parcel F were historically used as an agricultural field from the mid-1950s to the mid-1960s until it was repurposed into Maple Hill Tree Services (a commercial arborist) in the mid-1980s. One (1) wooden residential building with a concrete foundation that was constructed in the mid-1960s and is located on the eastern portion of the parcel along ninth line (Site Building A). One (1) wooden building used as an office for Maple Hill Tree services was constructed in the early 1980s and is located behind the residential home (Site Building B). A shed that was constructed in the mid-1980s is located on the southern portion of the parcel (Site Building C). Three wooden storage units that were constructed in the mid-2000s are located on the southern portion of the parcel (Site Buildings D, E, and F). Finally, Site Building G is a drive-shed that is located on the northern portion of the parcel.

It is DS’s understanding that this Phase Two ESA has been requested for due diligence purposes in association with the proposed redevelopment of the Property.

It is the opinion of DS that the intended future property use (residential) constitutes a more sensitive property use, as defined under O.Reg. 153/04 (as amended) than the current commercial use. Given that the proposed change in property use is to a more sensitive property use, the filing of a Record of Site Condition (RSC) with the Ontario Ministry of Environment, Conservation and Parks (MECP) will be mandated under O.Reg. 153/04 (as

amended). DS understands that this Phase Two ESA may be used to support the filing of a Record of Site Condition (RSC) as part of the proposed redevelopment of the Phase Two Property for residential purposes.

The Phase Two ESA was conducted in general to satisfy the intent of the requirements, methodology and practices for a Phase Two ESA as described in Ontario Regulation 153/04 (as amended). The objective of this Phase Two ESA is to confirm whether contaminants are present, and at what concentration are they present on the Phase Two Property, as related to the Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA.

The Phase One ESA completed in May 2019 indicated that the Phase Two Property was first developed for residential purposes between 1956 and 1966 and has been used for mixed residential/commercial since 1984. A total of eight (8) Potentially Contaminating Activities (PCAs) were identified in the Phase One ESA which were considered to be contributing to eight (8) APECs on the Phase Two Property. A summary of the APECs, associated PCAs, and contaminants of potential concern (copc) identified is presented in the table below:

Table 1-1: Summary of APECs

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA-30: Importation of Fill Material of Unknown Quality -Historical Importation of fill material for grading purposes	On Site	Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil
APEC-2	Western portion of Parcel E	PCA-52: Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems -Parcel E was used for vehicle storage and maintenance.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-3	Western portion of Parcel E	PCA-58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners - Parcel E was registered for waste oils and lubricants in the 1980s and 1990s.	On-Site	PHCs (F1-F4), BTEX, PAHs	Soil
				PHCs (F1-F4), BTEX	Groundwater
APEC-4	Southwest corner of Parcel E	PCA-28: Gasoline and associated products storage in fixed tanks -a generator associated with a cell tower is located on the western side of Parcel E.	On Site	PHCs, PAHs	Soil
APEC-5	South-west central portion of Parcel F in the vicinity of Site Building E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of three (3) ASTs identified in the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-6	On the south-side of Site Building I on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of two (2) ASTs identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-7	On the south-east exterior of Site Building B on Parcel F	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) AST identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-8	Within the vicinity of Site Building H on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) fuel oil AST in the basement of Site Building H identified by the Site Interview.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water

Based on the findings of the Phase One ESA it was concluded that a Phase Two ESA is warranted in order to assess the soil and groundwater conditions on the Phase Two Property.

The Phase Two ESA involved the advancement of eight (8) boreholes, which was completed between May 15, 2019 and May 16, 2019. The boreholes were advanced to a maximum depth of 6.1 metres below ground surface (mbgs) under the supervision of DS personnel. Groundwater monitoring wells were installed in four (4) of the boreholes to facilitate the collection of groundwater samples and the assessment of groundwater flow direction. The borehole locations were determined based on the findings of the Phase One ESA. All APECs were investigated with boreholes and/or monitoring wells in accordance with the requirements of O.Reg. 153/04 (as amended). Soil and groundwater samples were collected and submitted for analysis of all PCOCs, including: PHC (F1-F4), VOCs, Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, and PAHs.

The soil and groundwater analytical results were compared to the “Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition” provided in the MECP document entitled, “*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*” dated April 15, 2011 (Table 2 Standards) for medium and fine-textured soils and residential/parkland/institutional property use (herein referred to as Table 2 SCS).

Based on the findings of the Phase Two ESA, DS presents the following findings:

- ◆ Boreholes drilled encountered fill material approximately 1.5 to 2.3 m in thickness. The fill material was generally heterogeneous and consisted of asphalt, silty sand, sandy silt, clay, and clayey silt with trace rootlets and inorganics. Woodchips were

present in the fill material of BH19-16 and BH19-17. The native overburden material encountered below the fill material consisted of clayey silt till, extending to a maximum explored depth of 6.6 mbgs. Shale bedrock was not encountered in the boreholes advanced on the Phase Two Property.

- ◆ The depth to groundwater was measured in four (4) monitoring wells installed during the course of this investigation. The monitoring wells were screened to intercept the groundwater table in the clayey silt till unit. The depth to groundwater was found to range between 0.41 to 0.90 mbgs on May 23, 2019. Based on the groundwater elevations recorded, the groundwater flow direction appears to be easterly towards the Osprey Marsh. It is possible that the groundwater levels may vary seasonally. The groundwater levels may also be impacted by other factors such as historical infilling activities, subsurface utility trenches, and similar subsurface anomalies. The groundwater flow direction can only be confirmed through long term monitoring.
- ◆ Soil samples were collected from the boreholes advanced on the Phase Two Property and submitted for analysis of Metals and ORPs, PHCs, VOCs and PAHs. The results of the chemical analyses conducted indicated the following exceedances of the Table 2 SCS:

Table 1-2: Summary of Soil Impacts Identified

Sample ID	Sample Depth (mbgs)	Parameter	Units	Table 2 Fine SCS	Analytical Result
BH19-12 SS1	0-0.6	Conductivity	µg/g	0.7	1.7
		SAR	µg/g	5	18
BH19-18 SS1	0-0.6	Conductivity	µg/g	0.7	1.2
		SAR	µg/g	5	5.9
BH19-19 SS1	0-0.6	Conductivity	µg/g	0.7	0.74
BH19-12 SS2	0.8-1.4	PHC (F1-BTEX)	µg/g	55	69
		PHC (F2)	µg/g	98	1100
BH19-13 SS4	2.3-2.9	PHC (F2)	µg/g	98	240

- ◆ Groundwater samples were collected from the monitoring wells installed on the Phase Two Property and submitted for analysis of Metals and ORPs, PHCs and VOCs

The results of the chemical analyses conducted indicated the following exceedances of the Table 2 SCS:

Table 1-3: Summary of Groundwater Impacts Identified

Sample ID	Well Screen Interval (mbgs)	Parameter	Units	Table 2 FineSCS	Reported Value
BH19-15	2.4-5.5	Cobalt	µg/L	3.8	4.3
BH19-18	3.1-6.2	Sodium	µg/L	490000	510000
		Chloride	mg/L	790	1200

Based on a review of the findings of this Phase Two ESA, DS presents the following conclusions and recommendations:

- ◆ EC, SAR and PHC impacts were identified in soil. Generally, the EC and SAR impacts were identified within the fill material. The vertical extent of the EC and SAR impacts is currently unknown. The vertical extent of the PHC impacts identified in BH19-12 is inferred to be 2.3 mbgs, based on the analytical data available at this time. The vertical extent of the PHC impacts identified in BH19-13 is currently unknown. Additional delineation and remediation of the impacted soils will be required in order to support the filing of an RSC for the Property.
- ◆ Marginally elevated concentrations of Cobalt, sodium and chloride in excess of the Table 2 SCS were identified two (2) of the four (4) monitoring wells. Additional groundwater sampling is recommended at this time to confirm the concentrations of metals and ORPs in groundwater.
- ◆ The results of this Phase Two ESA indicate that the applicable Site Condition Standards have not been met. Additional delineation will be required in order to further assess the horizontal and vertical extent of the metals/ORPs and PHC impacts in soil. Additional groundwater sampling is recommended in order to confirm the groundwater quality on-Site.
- ◆ All monitoring wells should be decommissioned in accordance with O.Reg. 903 when no longer required.

2.0 Introduction

DS Consultants Ltd. (DS) was retained by Derry Britannia Developments Limited to complete a Phase Two Environmental Site Assessment (ESA) of the Property located at 6302 and 6314 Ninth Line (Parcels E and F), Mississauga, Ontario, herein referred to as the “Phase Two Property” or “Site”. It is DS’s understanding that this Phase Two ESA has been requested for due diligence purposes in association with the proposed redevelopment of the Property. DS understands that this Phase Two ESA may be used to support the filing of a Record of Site Condition (RSC) as part of the proposed redevelopment of the Site for residential purposes.

It is the opinion of DS that the intended future property use (residential) constitutes a more sensitive property use, as defined under O.Reg. 153/04 (as amended) than the current commercial use. Given that the proposed change in property use is to a more sensitive property use, the filing of a Record of Site Condition (RSC) with the Ontario Ministry of Environment, Conservation and Parks (MECP) will be mandated under O.Reg. 153/04 (as amended).

The Phase Two ESA was conducted in general to satisfy the intent of the requirements, methodology and practices for a Phase One ESA as described in Ontario Regulation 153/04 (as amended). The objective of this Phase Two ESA is to confirm whether contaminants are present, and at what concentration are they present on the Phase Two Property, as related to the Areas of Potential Environmental Concern (APEC) identified in the Phase One ESA.

2.1 Site Description

The Phase One Property is a 2.28-hectare (6.98 acres) parcel of land situated within a mixed residential, agricultural and commercial neighborhood in the City of Mississauga, Ontario. The Phase One Property is located approximately 190 m north of the intersection of Ninth Line and Foxwood Avenue.

For the purposes of this report, Ninth Line is assumed to be aligned in a north-south orientation, and Foxwood Avenue in an east-west orientation. A Plan of Survey for the Phase One Property prepared by JD Barnes, an Ontario Land Surveyor, has been provided under Appendix A.

Parcel E was historically used as an agricultural field from the mid-1950s to the mid-1960s, until it was repurposed as a vehicle storage facility and residential premises in the early 1990s. One single-story residential building with a basement (Site Building H), constructed in the mid-1960s, located on the eastern portion of the parcel along Ninth Line is currently located on the property. An aluminum drive-shed with one garage door, constructed circa 1985 (Site Building I), is located behind the residential building. Two wooden storage sheds line the southern portion of the property (Site Buildings J and K). Several shipping containers used for storage were observed on the eastern side of the property. Parcel E is surrounded by Parcel F on the south and west sides.

Parcel F were historically used as an agricultural field from the mid-1950s to the mid-1960s until it was repurposed into Maple Hill Tree Services (a commercial arborist) in the mid-1980s. One (1) wooden residential building with a concrete foundation that was constructed in the mid-1960s and is located on the eastern portion of the parcel along ninth line (Site Building A). One (1) wooden building used as an office for Maple Hill Tree services was constructed in the early 1980s and is located behind the residential home (Site Building B). A shed that was constructed in the mid-1980s is located on the southern portion of the parcel (Site Building C). Three wooden storage units that were constructed in the mid-2000s are located on the southern portion of the parcel (Site Buildings D, E, and F). Finally, Site Building G is a drive-shed that is located on the northern portion of the parcel.

A site location plan depicting the orientation and positron of the buildings is depicted in Figure 2.

Additional details regarding the Phase Two Property are provided in the table below.

Table 2-1: Phase Two Property Information

Criteria	Information	Source
Legal Description	<p><u>Parcel E – 6314 Ninth Line</u> Part of Lot 7, Concession 9, Trafalgar New Survey, as in 622055 City of Mississauga</p> <p><u>Parcel F – 6302 Ninth Line</u> Part of Lot 7, Concession 9, Trafalgar New Survey, as in 5544998 City of Mississauga</p>	Client
Property Identification Number (PIN)	<p>Parcel E: 24938-0058 (LT)</p> <p>Parcel F: 24938-0057 (LT)</p>	Legal Survey
Site Area	2.28-hectares (6.98 acres)	City of Mississauga

2.2 Property Ownership

The ownership details for the Phase Two Property are provided in the table below.

Table 2-2: Phase Two Property Ownership

Property Owner	Address	Contact
Derry Britannia Developments Limited	7880 Keele Street, Vaughan Vaughan, Ontario L4K 4G7	Eric Mueller (Project Manager) Phone: 416-302-3042

2.3 Current and Proposed Future Use

The Phase Two Property is currently occupied by Maple Hill Tree Services (a commercial arborist) on Parcel F and a vehicle storage lot on Parcel E which are both considered to be Commercial Property Use under O.Reg. 153/04 (as amended). It is DS's understanding that the Client intends to redevelop the Site for residential use.

2.4 Applicable Site Condition Standards

The applicable Site Condition Standards (SCS) for the Phase Two Property are considered by the Qualified Person (QP) to be the Table 2 SCS: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/Parkland/Institutional Use with medium-fine textured soils as contained in the April 15, 2011 Ontario Ministry of Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", herein referred to as the "Table 2 SCS".

The selection of the Table 2 SCS is considered appropriate based on the following rationale:

- ◆ Potable water wells are located within 500 m of the Property;
- ◆ The Site is not considered to be environmentally sensitive, as defined under O.Reg. 153/04 (as amended);
- ◆ The proposed future use of the Phase Two Property will be residential;
- ◆ The Site is not located within 30 m of a water body;
- ◆ The pH of the soils analyzed during this Phase Two ESA are within the accepted range specified under O.Reg. 153/04 (as amended); and
- ◆ Bedrock was not encountered within 2 metres of the ground surface

3.0 Background Information

3.1 Physical Setting

3.1.1 Water Bodies and Areas of Natural Significance

The tributary of East Sixteen Mile Creek is the closest body of water to the Phase Two Property, located approximately 40 m west of the Phase Two Property.

The Natural Heritage Areas database published by the Ministry of Natural Resources (MNR) was reviewed in order to identify the presence/absence of areas of natural significance including provincial parks, conservation reserves, areas of natural and scientific interest, wetlands, environmentally significant areas, habitats of threatened or endangered species, and wilderness areas. Although the Phase One Property is located within Peel Region, it is still included in the Halton Official Plans until the next publication. The Halton Official Plans and the Mississauga Official Plans were reviewed as part of this assessment.

Conservation Halton confirmed that the Phase One Property is located within the Sixteen Mile Creek Watershed. A natural hazard area was identified, however, no areas of natural or scientific interest were identified within the Phase One Study Area.

3.1.2 Topography and Surface Water Draining Features

The Phase Two Property is located in a mixed urban and rural setting, at an elevation of 190 metres above sea level (masl). The topography of the Phase Two Property is generally flat. The neighbouring property are generally at similar elevations and the topography in the vicinity of the Phase Two Property generally slopes to the south. There are no drainage features (e.g. ditches, swales, etc.) present on-Site. Surface water flow associated with precipitation events is anticipated to run overland and drain into the municipal storm sewer catch basins.

3.2 Past Investigations

3.2.1 Previous Report Summary

The following environmental and geotechnical reports were provided for DS to review:

Parcel E

- ◆ *“Phase I Environmental Site Assessment, 6314 Ninth Line, Mississauga, Ontario”, prepared for Mattamy Homes, prepared by Sirati and Partners Consultants Limited (SPCL), dated January 25, 2017 (SPCL 2017 Phase I ESA); and*
- ◆ *“Preliminary Report on Geotechnical Investigation Proposed Residential Development, 6314 Ninth Line, Mississauga, Ontario”, prepared for Mattamy Homes, prepared by Sirati and Partners Consultants Limited (SPCL), dated January 30, 2017 (SPCL 2017 Geotechnical Investigation).*

Parcel F

- ◆ *“Preliminary Geotechnical Investigation Report Hill Property, 6302 Ninth Line, Milton, Ontario”, prepared for Mattamy Development Corporation, prepared by Shad & Associates Inc., dated September 8, 2008 (Shad & Associates Inc. 2008 Geotechnical Investigation);*
- ◆ *“Phase I Environmental Site Assessment, 6302 Ninth Line, Mississauga, Ontario”, prepared for Mattamy Development Corporation c/o Shad & Associates Inc., prepared by Pinchin, dated April 15, 2015 (Pinchin 2015 Phase I ESA);*

These reports were reviewed in order to assess for the presence of known or suspected PCAs and APECs, and to determine if there are known soil and/or groundwater impacts on the Phase One Property. A summary of the pertinent details of the reports reviewed is provided below:

SPCL 2017 Phase I ESA (Parcel E)

The SPCL 2018 Phase I ESA was reportedly conducted in general accordance with Ontario Regulation 153/04, dated April 15, 2011 (as amended), and included a review of readily available historical records and reasonably ascertainable regulatory information, a Site Reconnaissance, interviews, evaluation of information, and reporting. The following pertinent information was noted by DS:

- ◆ The Property was first developed in the 1840s for agricultural use until its redevelopment in the mid 1960s for residential and commercial purposes – mainly storage of trailers, RVs and boats).

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- ◆ Maintenance of trucks/trailers, including oil changes, regularly occurred in the barn on the property.
 - ◆ Two above ground diesel storage tanks (ASTs) for use of fueling trailers and RVs are located on the property with no secondary containment.
 - ◆ Site Building H is heated using natural gas.
 - ◆ The property was registered with the MECP for industrial liquid waste (waste oils and lubricants) by Salid Investment LTD in the 1980s and 1990s

It was recommended that a Phase Two ESA be completed on the property in order to confirm the quality of the soil and the groundwater at the property for potential contaminants of concern, associated with the current and historical use of the property.

SPCL 2017 Geotechnical Investigation (Parcel E)

The Geotechnical Investigation was reportedly conducted in order to obtain information about the subsurface conditions at borehole locations and from the findings in the boreholes to make preliminary recommendations pertaining of the geotechnical design of underground utilities, roads, and to comment on the foundation conditions for general house construction. The following pertinent information was noted by DS:

- ◆ Four boreholes were advanced on the property to a maximum depth of 8.2 mbgs. Monitoring wells were installed in three of the boreholes advanced.
- ◆ The site consists of a 75-220 mm thick surficial layer of topsoil. Fill material was encountered in all boreholes from 0.9-2.3 mbgs. A 50mm thick buried layer of topsoil was encountered within the fill material in one of the boreholes encountered. Below the fill material native fill material was encountered 2.3 mbgs with a layer of silty clay till underlaying to depths of approximately 4.4-6.1mbgs. Sandy silt till was encountered at borehole termination depth.
- ◆ Groundwater at depths ranging between 0.7-6.3 mbgs.

Shad & Associates 2008 Geotechnical Investigation (Parcel F)

The Geotechnical Investigation was reportedly conducted in order to obtain preliminary information about the existing subsurface conditions at the site. The following pertinent information was noted by DS:

- ◆ Five boreholes were advance on the property in 2008 to a maximum depth of 5 meters below ground surface (mbgs). Monitoring wells were installed in all boreholes advanced.

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- ◆ The site consists of a surficial granular fill layer underlain by a topsoil layer, and then a clayey silt/silty clay fill layer approximately 0.1-1mbgs. This was underlain by a silty clay/clayey silt deposit extending approximately 1.8-3.2 mbgs. Some of the boreholes encountered a clayey silt/clayey silt till deposit extending to a depth of 3.9 mbgs or until borehole termination depth. A sandy silt till was encountered in two of the boreholes advanced until termination depth.
 - ◆ Groundwater was encountered in two of the monitoring wells ranging from 2.4-3.9mbgs. The other three monitoring wells were found to be dry.

Pinchin 2015 Phase I ESA (Parcel F)

The Pinchin 2015 Phase I ESA was conducted in general accordance with CSA document entitled "Phase I Environmental Site Assessment" (CSA Document Z768-01), dated November 2001 (reaffirmed 2006), and included a review of readily available historical records and reasonably ascertainable regulatory information, a Site Reconnaissance, interviews, evaluation of information, and reporting. The following pertinent information was noted by DS:

- ◆ Site Building A was constructed circa 1957 on previously undeveloped land.
- ◆ The Property has been used for residential and commercial (arborist) purposes since 1957.
- ◆ The Property includes seven buildings, the single family residential dwelling was built in 1957, an office and a workshop/storage shed in the late 1970s, a storage building in 2008, a wood storage shed in 2003, another wood storage shed in 2007 with an addition in 2009, and a drive shed in 2014.
- ◆ The property was occupied by Maple Hill Tree Services, an arborist company.
- ◆ Three (3) double walled above ground storage tanks (ASTs) were present on the property. The tanks were reportedly used to fuel equipment and trucks associated with the business. Additionally, one (1) abandoned single-walled AST was also present on the property.
- ◆ Four propane tanks for heating purposes were located by the office and storage shed.
- ◆ An in-ground pool was present behind the residential dwelling.
- ◆ The property is serviced municipally (water and sewer).

Pinchin concluded that there were no potentially contaminating activities that would result in subsurface soil impacts present on the site. Pinchin recommended that a designated substances survey be completed prior to any demolition, that the abandoned AST be

decommissioned, and the decommissioning of the water wells present on the property. A Phase II ESA was not recommended.

A summary of the potentially contaminating activities observed is provided in Section 7.2.

Previous Report Summary:

Based on a review of the previous reports provided for DS to review, the following conclusions are made:

Parcel E

- ◆ Parcel E was used as a commercial storage facility for trailers, RVs, and boats from approximately the early 1960s.
- ◆ Maintenance of trucks/trailers, including oil changes, regularly occurred in Site Building I on the parcel.
- ◆ Two (ASTs) for use of fueling trailers and RVs are located on the property with no secondary containment.
- ◆ The property was registered with the MECP for industrial liquid waste (waste oils and lubricants) by Salid Investment LTD in the 1980s and 1990s.
- ◆ Fill material was encountered on the property from approximately 0.9-2.3 mbgs.
- ◆ Groundwater ranged from depths approximately 0.7-6.3 mbgs.

Parcel F

- ◆ The Property has been used for residential and commercial (arborist) purposes since 1957.
- ◆ The Property includes seven buildings, the single family residential dwelling was built in 1957 (Site Building A), an office and a workshop/storage shed in the late 1970s (Site Building B), a storage building in 2008, a wood storage shed in 2003, another wood storage shed in 2007 with an addition in 2009, and a drive shed in 2014.
- ◆ The property was occupied by Maple Hill Tree Services, an arborist company.
- ◆ Three double walled above ground storage tanks (ASTs) were present on the property. The tanks were reportedly used to fuel equipment and trucks associated with the business. Additionally, one abandoned single-walled AST was also present on the property.
- ◆ Four propane tanks for heating purposes were located by the office and storage shed.
- ◆ Fill material was encountered from approximately 0.1-1mbgs.
- ◆ Groundwater was encountered from 2.4-3.9mbgs.

3.2.2 Use of Previous Analytical Results

DS has reviewed the reports provided for the purpose of identifying Areas of Potential Environmental Concern on the Phase Two Property. No previous analytical data was available for DS to review at the time of this investigation. DS has not relied on any previous analytical results for the purposes of this Phase Two ESA.

4.0 Scope of the Investigation

The scope of the Phase Two ESA was designed to investigate the portions of the Site determined in the Phase One ESA to be Areas of Potential Environmental Concern. This Phase Two ESA was conducted in general accordance with O.Reg. 153/04 (as amended). The scope of the investigation including the subsurface investigation, sampling, and laboratory analysis was based on the findings of the Phase One ESA and was limited to the portions of the site which were accessible.

4.1 Overview of Site Investigation

The following tasks were completed as part of the Phase Two ESA:

- ◆ Preparation of a Health and Safety Plan to ensure that all work was executed safely;
- ◆ Clearance of public private underground utility services prior to commencement of subsurface investigative operations;
- ◆ Preparation of a Sampling and Analysis Plan (SAP);
- ◆ Retained a MECP licenced driller to advance a total of eight (8) boreholes on the Phase Two Property, to depths ranging between 4.6 to 6.1 mbgs. Four (4) of the boreholes were instrumented with groundwater monitoring wells upon completion. The soil lithology was logged during drilling, and representative soil samples were collected at regular intervals. The soil samples were screened for organic vapours using an RKI Eagle 2 MultiGas Detector and examined for visual and olfactory indications of soil impacts;
- ◆ Submitted “worst case” soil samples collected from the boreholes for laboratory analysis of relevant contaminants of potential concern (COPCs) as identified in the Phase One ESA;
- ◆ Conducted groundwater level measurements in the monitoring wells in order to determine the groundwater elevation, and to establish the local groundwater flow direction;
- ◆ Surveyed all monitoring wells to a geodetic benchmark;

- ◆ Developed and purged all monitoring wells prior to sampling. Groundwater samples were collected for all COPCs identified in the Phase One ESA;
- ◆ Compared all soil and groundwater analytical data to the applicable MECP SCS; and
- ◆ Prepared a Phase Two ESA Report in general accordance with O.Reg. 153/04 (as amended).

4.2 Media Investigated

4.2.1 Rationale for Inclusion or Exclusion of Media

Table 4-1: Rationale of Sampling Media

Media	Included or Excluded	Rationale
Soil	Included	Soil was identified as a media of potential impact in the Phase One ESA, based on the historical operations conducted on-Site.
Groundwater	Included	Groundwater was identified as a media of potential impact in the Phase One ESA, based on the historical operations conducted on-Site.
Sediment	Excluded	Sediment is not present on the Phase Two Property.
Surface Water	Excluded	Surface water is not present on the Phase Two Property.

4.2.2 Overview of Field Investigation of Media

Table 4-2: Field Investigation of Media

Media	Methodology of Investigation
Soil	A total of eight (8) boreholes were advanced on the Phase Two Property, to a maximum depth of 6.1 mbgs. Soil samples were collected and submitted for analysis of all relevant PCOCs.
Groundwater	A total of four (4) monitoring wells were installed on the Phase Two Property at the time of the investigation. Representative groundwater samples were collected from each monitoring well and submitted for analysis of all relevant PCOCs.

4.3 Phase One Conceptual Site Model

A Conceptual Site Model was developed for the Phase One Property, located at 6302 and 6314 Ninth Line (Parcels E and F), Mississauga, Ontario. The Phase One Conceptual Site Model is presented in Drawings 3A, 3B, and 4 and visually depict the following:

- ◆ Any existing buildings and structures

- ◆ Water bodies located in whole, or in part, on the Phase One Study Area
- ◆ Areas of natural significance located in whole, or in part, on the Phase One Study Area
- ◆ Water wells at the Phase One Property or within the Phase One Study Area
- ◆ Roads, including names, within the Phase One Study Area
- ◆ Uses of properties adjacent to the Phase One Property
- ◆ Areas where any PCAs have occurred, including location of any tanks
- ◆ Areas of Potential Environmental Concern

4.3.1 Potentially Contaminating Activity Affecting the Phase One Property

All PCAs identified within the Phase One Study Area are presented on Figure 3B, and discussed in Section 7.2 above. The PCAs which are considered to contribute to APECs on, in or under the Phase One Property are summarized in the table below:

Table 4-3: Summary of PCAs Contributing to APECs

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA-30: Importation of Fill Material of Unknown Quality -Historical Importation of fill material for grading purposes	On Site	Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil
APEC-2	Western portion of Parcel E	PCA-52: Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems -Parcel E was used for vehicle storage and maintenance.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-3	Western portion of Parcel E	PCA-58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners - Parcel E was registered for waste oils and lubricants in the 1980s and 1990s.	On-Site	PHCs (F1-F4), BTEX, PAHs	Soil
				PHCs (F1-F4), BTEX	Groundwater

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-4	Southwest corner of Parcel E	PCA-28: Gasoline and associated products storage in fixed tanks -a generator associated with a cell tower is located on the western side of Parcel E.	On Site	PHCs, PAHs	Soil
APEC-5	South-west central portion of Parcel F in the vicinity of Site Building E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of three (3) ASTs identified in the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-6	On the south-side of Site Building I on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of two (2) ASTs identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-7	On the south-east exterior of Site Building B on Parcel F	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) AST identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-8	Within the vicinity of Site Building H on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) fuel oil AST in the basement of Site Building H identified by the Site Interview.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water

N/S - not specified in Table 2, Schedule D, of O.Reg. 153/04

4.3.2 Contaminants of Potential Concern

A summary of the contaminants of potential concern identified for each respective APEC is presented in Table 4-3 above. The following contaminants of potential concern were

identified for the Phase One Property: PHCs, VOCs, BTEX, Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PAHs, PCBs.

4.3.1 Underground Utilities and Contaminant Distribution and Transport

Underground utilities can affect contaminant distribution and transport. Trenches excavated to install utility services, and the associated granular backfill may provide preferential pathways for horizontal contaminant migration in the shallow subsurface.

Underground utilities were identified at the Phase One Property, including water, natural gas, electrical, and sewer services to the residential dwelling. Plans were not available to confirm the depths or presence of utilities leading to the residential dwelling; however, they are estimated to be installed at depths ranging from 2 to 3 metres below ground surface.

The groundwater on the property is located approximately 0.41-0.90 mbgs, therefore utility corridors have the potential to act as preferential pathways for contaminant distribution and transport in the event that shallow subsurface contaminants exist at the Phase One Property.

4.3.2 Geological and Hydrogeological Information

The topography of the Phase One Property is generally flat, with a surface elevation of 190 metres above sea level (masl). The topography within the Phase One Study Area generally slopes to the south, towards a tributary of East Sixteen Mile Creek, located approximately 40 m west of the Phase One Property. The nearest body of water is Osprey Marsh, located approximately 620 m southeast of the Phase One Property. Based on a review of the MECP well records, the depth to groundwater in the vicinity of the Phase One Property is approximately 3.66-7.62m. Previous geotechnical reports indicated that the groundwater levels on Parcel E ranged from 0.7 to 2.1 mbgs (SPCL 2017 Geotechnical investigation) and from 2.4 to 3.9 mbgs (Shad and Associates 2008 Geotechnical Investigation) on Parcel F. The shallow groundwater flow direction within the Phase One Study Area is inferred to be south towards a tributary of the East Sixteen Mile Creek.

The Site is situated within a beveled till plain physiographic region. The surficial geology within the Phase One Study area is described as “fine-textured glaciolacustrine deposits”. The underlying bedrock within the area generally consists of shale, limestone, dolostone, and siltstone of the Queenston Formation. Based on a review of the MECP well records (well ID 2806566), the bedrock in the Phase One Study Area is anticipated to be encountered at an approximate depth range of 17.7 to 22.8 meters below ground surface (mbgs).

4.3.3 Uncertainty and Absence of Information

DS has relied upon information obtained from federal, provincial, municipal, and private databases, in addition to records and summaries provided by EcoLog ERIS. All information obtained was reviewed and assessed for consistency, however the conclusions drawn by DS are subject to the nature and accuracy of the records reviewed.

All reasonable inquiries were made to obtain reasonably accessible information, as mandated by O.Reg.153/04 (as amended). All responses to database requests were received prior to completion of this report. This report reflects the best judgement of DS based on the information available at the time of the investigation.

Information used in this report was evaluated based on proximity to the Phase One Property, anticipated direction of local groundwater flow, and the potential environmental impact on the Phase One Property as a result of potentially contaminating activities.

The QP has determined that the uncertainty does not affect the validity of the Phase One ESA Conceptual Site Model or the conclusions of this report.

4.4 Deviations from Sampling and Analysis Plan

The Phase Two ESA was completed in accordance with the SAP.

4.5 Impediments

Several impediments were present at the time of this investigation, including the presence of parked/stored motor vehicles, the existing site buildings and shipping containers. In general, the presence of these impediments did not prevent DS from investigating the APECs identified on the Property.

5.0 Investigation Method

5.1 General

The Phase Two ESA followed the methodology outlined in the following documents:

- Ontario Ministry of the Environment “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario” (December 1996);
- Ontario Ministry of the Environment “Guide for Completing Phase Two Environmental Site Assessments under Ontario regulation 153/04” (June 2011);
- Ontario Ministry of the Environment “Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act” (July 2011) (Analytical Protocol);

The methods used in the Phase Two ESA investigation did not differ from the associated standard operating procedures.

5.2 Drilling and Excavating

A site visit was conducted prior to drilling in order to identify the borehole locations based on the APECs identified in the Phase One ESA. The selected borehole locations are presented on Figure 4. The borehole locations were cleared of underground public and private utility services prior to commencement of drilling. A summary of the drilling activities is provided in the table below.

Table 5-1: Summary of Drilling Activities

Parameter	Details
Drilling Contractor	Terra Firma Environmental Services
Drilling Dates	May 15-16, 2019
Drilling Equipment Used	Track Mounted CME 55
Measures taken to minimize the potential for cross contamination	<ul style="list-style-type: none">◆ Soil sampling was conducted using a 50 mm stainless steel split spoon sampler. The split spoon sampler was brushed clean of soil, washed in municipal water containing phosphate free detergent, rinsed in municipal water, and then rinsed with distilled water for each sampling interval in order to reduce the potential for cross contamination;◆ Soil samples were extracted from the interior of the sampler rather than from areas in contact with the sampler sidewalls;◆ Use of dedicated and disposable nitrile gloves for the handling of soil samples. A new set of gloves was used for each sample.
Sample collection frequency	Samples were collected at a frequency of every 0.6 m per 0.8 m from the ground surface to borehole termination depth.

5.3 Soil Sampling

Soil samples were collected using a 50 mm stainless steel split spoon sampler. Discrete soil samples were collected from the split-spoon samplers by DS personnel using dedicated nitrile gloves.

A portion of each sample was placed in a resealable plastic bag for field screening, and the remaining portion was placed into laboratory supplied glass sampling jars. Samples intended for VOC and the F1 fraction of petroleum hydrocarbons analysis were collected

using a laboratory-supplied soil core sampler, placed into the vials containing methanol for preservation purposes and sealed using Teflon lined septa lids. All sample jars were stored in dedicated coolers with ice for storage, pending transport to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

The subsurface soil conditions were logged by DS personnel at the time of drilling and recorded on field borehole logs. The borehole logs are presented under Appendix C. Additional detail regarding the lithology encountered in the boreholes is presented under Section 6.1 and depicted visually in Figure 8A and 8B.

5.4 Field Screening Measurements

All retrieved soil samples were screened in the field for visual and olfactory observations. No obvious visual or olfactory evidence of potential contamination were noted. No aesthetic impacts (e.g. cinders, slag, hydrocarbon odours) were encountered during this investigation. The soil sample headspace vapour concentrations for all soil samples recovered during the investigation were screened using portable organic vapour testing equipment in accordance with the procedure outlined in the MECP's *'Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario'*.

The soil samples were inspected and examined to assess soil type, ground water conditions, and possible chemical contamination by visual and olfactory observations or by organic vapor screening. Samples submitted for chemical analysis were collected from locations judged by the assessor to be most likely to exhibit the highest concentrations of contaminants based on several factors including (i) visual or olfactory observations, (ii) sample location, depth, and soil type (iii) ground water conditions and headspace reading. A summary of the equipment used for field screening is provided below:

Table 5-2: Field Screening Equipment

Parameter	Details
Make and Model of Field Screening Instrument	RKI Eagle 2, Model 5101-P2 Serial Number: E2G721
Chemicals the equipment can detect and associated detection limits	VOCs with dynamic range of 0 parts per million (ppm) to 2,000 ppm PHCs with range of 0 to 50, 000 ppm
Precision of the measurements	3 significant figures
Accuracy of the measurements	VOCs: $\pm 10\%$ display reading + one digit Hydrocarbons: $\pm 5\%$ display reading + one digit

Parameter	Details
Calibration reference standards	PID: Isobutylene CGD: Hexane
Procedures for checking calibration of equipment	In-field re-calibration of the CGI was conducted (using the gas standard in accordance with the operator's manual instructions) if the calibration check indicated that the calibration had drifted by more than +/- 10%.

A summary of the soil headspace measurements is provided in the borehole logs, provided under Appendix C.

5.5 Groundwater Monitoring Well Installation

Monitoring wells were installed upon completion of four (4) of the boreholes advanced on the Phase Two Property. The monitoring wells were constructed of 51-millimetre (2-inch) inner diameter (ID) flush-threaded schedule 40 polyvinyl chloride (PVC) risers, equipped with a 3.1 m length of No. 10 slot PVC screen. The well screens were sealed at the bottom using a threaded cap and at the top with a lockable J-plug.

Silica sand was placed around and up to 0.6m above the well screen to act as a filter pack. Bentonite was placed from the ground surface to the top of the sand pack. The wells were completed with protective aboveground monument casings.

Details regarding the monitoring well construction can be found in Table 1, and on the borehole logs provided in Appendix C.

Disposable nitrile gloves were used to minimize the potential for cross-contamination during well installation. Dedicated equipment was used for well development and sampling for further minimize the risk of cross contamination.

The monitoring wells were developed on May 17, 2019. In accordance with DS SOPs for monitoring well development, the wells were developed by removing a minimum of three standing water column volumes using dedicated inertial pumps comprised of Waterra polyethylene tubing and dedicated foot valves.

5.6 Groundwater Field Measurement of Water Quality Parameters

Field measurements of water quality parameters including temperature, specific conductivity, pH, turbidity, dissolved oxygen, oxidation-reduction potential and turbidity were collected using a flow-through cell and a YSI Water Quality Meter (YSI-556™). The YSI Water Quality Meter was calibrated by the supplier (Maxim Environmental) in accordance with the manufacturer's specifications.

The measurements were conducted at regular intervals in order to determine whether stabilized geochemical conditions had been established in the monitoring well, indicating representative groundwater conditions.

The field measurements have been archived and can be provided upon request.

5.7 Groundwater Sampling

Groundwater samples were collected a minimum of 24 hours after the development of the monitoring wells. The wells were purged using a peristaltic pump equipped with dedicated polyethylene tubing. A YSI Water Quality Meter equipped with a flow-through cell was used to monitor the geochemical conditions during purging to assess whether steady-state conditions were achieved prior to sampling.

Samples were collected upon stabilization of the water quality parameters. Groundwater samples for metals analysis were field filtered using dedicated 0.45 micro in-line filters. The groundwater was transferred directly into laboratory supplied containers and preserved as appropriate using the containers supplied by the analytical laboratory. The samples were placed in coolers upon completion of sampling and stored on ice for storage, pending transport to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

5.8 Sediment Sampling

No sediment as defined under O.Reg. 153/04 (as amended) was present on the Phase Two Property at the time of this investigation. Sediment sampling was not conducted as a result.

5.9 Analytical Testing

The soil and groundwater samples collected were submitted to Maxxam Analytics under chain of custody protocols. Maxxam is an independent laboratory accredited by the Canadian Association for Laboratory Accreditation. Maxxam conducted the analyses in accordance with the MECP document “Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act” dated March 9, 2004 (revised on July 1, 2011).

5.10 Residue Management Procedures

5.10.1 Soil Cuttings From Drilling and Excavations

The soil cuttings generated by the borehole drilling program left on-site adjacent to the boreholes for future disposal at the time of site redevelopment.

5.10.2 Water from Well Development and Purging

Excess water derived from well purging activities was stored in 20-L sealed plastic pails and temporarily stored on site for disposal by a MECP approved waste-hauler for disposal at a MECP-approved waste management facility.

5.10.3 Fluids from Equipment Cleaning

Excess equipment cleaning fluids were stored in 20-L sealed plastic pails and temporarily stored on site for disposal by a MECP approved waste-hauler for disposal at a MECP-approved waste management facility.

5.11 Elevation Surveying

The ground surface elevations of the boreholes/monitoring wells were surveyed using a Sokkia GCX-2 GNSS RTK receiver, referenced to geodetic benchmark 00819800485 (elevation of 200.642 masl) located approximately 250 m south of the intersection of Derry Road and Ninth Line.

The ground surface elevations can be found on the borehole logs presented in Appendix C.

5.12 Quality Assurance and Quality Control Measures

5.12.1 Sample containers, preservation, labelling, handling and custody for samples submitted for laboratory analysis, including any deviations from the SAP

All soil and groundwater samples were stored in laboratory-supplied sample containers in accordance with the MECP Analytical Protocol. A summary of the preservatives supplied by the laboratory is provided in the table below.

Table 5-3: Summary of Sample Bottle Preservatives

Media	Parameter	Sample Container
Soil	PHCs F1 VOCs	40 mL methanol preserved glass vial with septum lid.
	PHCs F2-F4 metals and ORPs PAHs	120 mL or 250 mL unpreserved glass jar with Teflon™-lined lid.
Groundwater	PHCs F1 VOCs	40 mL glass vial with septum lid, containing sodium bisulphate preservative.
	PHCs F2-F4	250 mL amber glass bottle with sodium bisulphate preservative
	PAHs	250 mL amber glass bottle (unpreserved)
	Inorganics	500 mL high density polyethylene bottle (unpreserved)
	Metals	125 mL high density polyethylene bottle containing nitric acid preservative

Media	Parameter	Sample Container
	Hexavalent Chromium	125 mL high density polyethylene bottle containing ammonium sulphate/ammonium hydroxide preservative
	Mercury	125 mL glass bottle containing hydrochloric acid preservative
	Cyanide	125 mL high density polyethylene bottle containing sodium hydroxide preservative

Groundwater samples were collected using dedicated equipment for each well. Groundwater samples collected for analysis of dissolved metals, mercury and hexavalent chromium were filtered in the field using a dedicated 0.45-micron in-line filter. Each sample container was labelled with a unique sample identification, the project number, and the sampling date. All samples were placed in an ice-filled cooler upon completion of sampling and kept under refrigerated conditions until the time of delivery to the analytical laboratory. A formal chain of custody was maintained for all samples submitted to the laboratory.

5.12.2 Description of equipment cleaning procedures followed during all sampling

Dedicated, disposable nitrile gloves were used for each sampling event to reduce the potential for cross-contamination.

The split spoon sampler was brushed clean of soil, washed in municipal water containing phosphate free detergent, rinsed in municipal water, and then rinsed with distilled water for each sampling interval in order to reduce the potential for cross contamination. Dedicated equipment was used for well development and sampling for further minimize the risk of cross contamination. Non-dedicated equipment (i.e. interface probe) was cleaned before initial use and between all measurement points with a solution of Alconox™ and distilled water. The Alconox™ solution was rinsed off using distilled water.

5.12.3 Description of how the field quality control measures referred to in subsection three (3) were carried out

Field duplicate samples were collected at the time of sampling. In accordance with O.Reg. 153/04, one duplicate sample was analyzed per ten samples submitted for analysis. A laboratory prepared trip blank accompanied the groundwater samples during each sampling event and was submitted for laboratory analysis of VOCs.

All field screening devices (i.e. RKI Eagle 2, YSI Water Quality Meter) were calibrated prior to use by the supplier. Calibration checks were completed, and re-calibrations were conducted as required.

5.12.4 Description of, and rationale for, any deviations from the procedures set out in the quality assurance and quality control program set out in the SAP

There were no deviations from the QA/QC program described in the SAP.

6.0 Review and Evaluation

6.1 Geology

A summary of the subsurface conditions is presented below. Additional details may be found in the borehole logs appended in Appendix C.

Fill material approximately 1.5 to 2.3 m in thickness was encountered in all of the boreholes advanced. The fill material was generally heterogeneous and consisted of asphalt, silty sand, sandy silt, clay, and clayey silt with trace rootlets and inorganics. Wood chips were present in the fill material of BH19-16 and BH19-17. The native overburden material encountered below the fill material consisted of clayey silt till, extending to a maximum explored depth of 6.6 mbgs. Shale bedrock was not encountered in the boreholes advanced on the Phase Two Property.

Table 6-1: Summary of Geologic Units Investigated

Geologic Unit	Inferred Thickness (m)	Top Elevation (masl)	Bottom Elevation (masl)	Properties
Fill Material	1.5-2.3	191.3	188.6	-
Clayey Silt Till	>5m	189.6	Unknown	Water Bearing Formation

The clayey silt till layer was found to be the first water bearing formation encountered and is considered to be an unconfined aquifer. In general, the relatively low permeability of the native soils encountered is anticipated to retard the downward migration of the potential contaminants of concern to the groundwater table on the Phase Two Property.

6.2 Ground Water Elevations and Flow Direction

6.2.1 Rationale for Monitoring Well Location and Well Screen Intervals

A total of four (4) monitoring wells were installed on the Phase Two Property in order to assess the groundwater quality in relation to APECs 2, 3, 5, 6, 7, and 8. The COPCs associated with these APECs were M&I, PHCs, BTEX and VOCs. The monitoring wells were screened to intersect the first water bearing formation encountered, in order to allow for the assessment

of LNAPL, and to provide information regarding the quality of the groundwater at the water table. The monitoring wells were screened within the clayey silt till unit encountered at an approximate depth of (2.4 to 3.1 mbgs). This unit is inferred to be an unconfined aquifer.

6.2.2 Results of Interface Probe Measurements

A summary of the groundwater level measurements is provided in Table 1. The groundwater level measurements were collected using a Solinst interface probe (Model 122). The depth to groundwater was found to range between 0.41 to 2.37 mbgs on May 23, 2019. There was no indication of DNAPL or LNAPL in the monitoring wells at this time.

6.2.3 Product Thickness and Free Flowing Product

No evidence of product was observed in the monitoring wells at the time of the investigation.

6.2.4 Groundwater Elevation

The groundwater elevation was calculated by subtracting the depth to groundwater from the surface elevation determined by the surface elevation survey conducted as part of this investigation. A summary of the groundwater elevations calculated is presented in Table 1. Generally, the groundwater elevation was found to range from 190.67 to 188.45 masl in the upper aquifer investigated.

6.2.5 Groundwater Flow Direction

The groundwater flow direction was interpreted using the groundwater elevations calculated for the monitoring wells installed on the Phase Two Property. Based on the groundwater elevations calculated, the groundwater flow direction is interpreted to be east towards the Osprey Marsh. The groundwater elevation contours and flow direction are presented on Figure 5.

6.2.6 Assessment of Potential for Temporal Variability in Groundwater Flow Direction

The shallow aquifer investigated is inferred to be an unconfined aquifer, based on the soil stratigraphy observed in the boreholes advanced on the Phase Two Property. It is possible that temporal variations in groundwater elevations may occur on the Phase Two Property in response to seasonal weather patterns.

Temporal variability in groundwater level has the ability to influence the groundwater flow direction. The degree of variation in groundwater levels on the Phase Two Property can only be confirmed with long-term monitoring.

6.2.7 Evaluation of Potential Interaction Between Buried Utilities and the Water Table

A perched water unit was observed within the fill material, situated atop the relatively low permeability clayey silt till unit. The groundwater table is inferred to be located within the clayey silt till unit, at depths ranging between 2-3 mbgs.

Buried utility services are present on the eastern portion of the Phase Two Property and are inferred to be situated at depths ranging between 2 and 3 mbgs. All boreholes were advanced in the central and western portion of the Phase Two Property. Groundwater impacts were not identified within the immediate vicinity of these buried services, as such it is the opinion of the QP that these utility services are unlikely to be acting as conduits for preferential migration of contaminants.

6.3 Ground Water Hydraulic Gradients

6.3.1 Horizontal Hydraulic Gradient

The horizontal hydraulic gradient was calculated based on the groundwater levels recorded on May 23, 2019.

Table 6-2: Summary of Horizontal Hydraulic Gradient Calculations

Hydrogeological Unit	Calculated Horizontal Hydraulic Gradient
Clayey Silt Till	Minimum: 0.02 Average: 0.02 Maximum: 0.02

6.3.2 Vertical Hydraulic Gradient

No well nests are currently present on the Phase Two Property, as such the vertical hydraulic gradient could not be calculated at this time.

6.4 Fine-Medium Soil Texture

6.4.1 Rationale for use of Fine-Medium Soil Texture Category

One (1) sample of the native clayey silt till was submitted for grain size analysis as part of the geotechnical investigation conducted in conjunction with this Phase Two ESA. The results of the grain size analysis indicated that the till is classified as medium-fine textured. Based on the lithology identified in the boreholes, it is the opinion of DS that more than two-thirds of the soils encountered are medium to fine textured.

6.4.2 Results of Grain Size Analysis

A summary of the soil samples analyzed, and the corresponding grain size results is presented in the table below:

Table 6-3: Summary of Grain Size Analyses

Sample	% Gravel	% Sand	% Silt	% Clay	Classification
BH19-16 SS5	0%	7%	45%	48%	Medium-fine textured

6.4.3 Rational for the Number of Samples Collected and Analyzed

The grain size analyses were conducted as part of the geotechnical investigation which was conducted concurrently. At least one sample was analyzed per stratigraphic unit encountered (excluding fill) in order to characterize the various strata encountered. Given the inherent heterogeneity of fill material, the fill material on site is assumed to be medium-fine textured.

6.5 Soil Field Screening

Soil vapour headspace readings were collected at the time of sample collection, the results of which are presented on the borehole logs (Appendix C). The soil vapour headspace readings were collected using a PID and CGD in methane elimination mode. The PID readings ranged between 0 and 3 ppm. The CGD readings ranged between 0 and 940 ppm.

The soil samples were also screened for visual and olfactory indicators of impacts (e.g. staining, odours). A PHC odour was noted in boreholes BH19-12 and BH19-3 at depths ranging between 0-1.5 mbgs during drilling.

6.6 Soil Quality

The results of the chemical analyses conducted are presented in Tables 5 through 9. A visual summary of the location of the sample locations is provided in Figures 6A through 6E. The laboratory certificates of analysis have been provided under Appendix D.

6.6.1 Metals and ORPs

A total of eight (8) samples were submitted for analysis of metals and ORPs. The results of the analyses are tabulated in Table 5 and presented on Figure 6A and 6B. The results of the analyses indicated the following exceedances of the Table 2 SCS:

Table 6-4: Summary of Metals and ORPs Exceedances in Soil

Sample ID	Sample Depth (mbgs)	Parameter	Units	Table 2 SCS	Reported Value
BH19-12 SS1	0-0.6	Conductivity	µg/g	0.7	1.7
		SAR	µg/g	5	18
BH19-18 SS1	0-0.6	Conductivity	µg/g	0.7	1.2
		SAR	µg/g	5	5.9
BH19-19 SS1	0-0.6	Conductivity	µg/g	0.7	0.74

6.6.2 Petroleum Hydrocarbons

A total of eight (8) samples, including one (1) field duplicate for QA/QC purposes were submitted for analysis of PHCs (incl. BTEX). The results of the analyses are tabulated in Table 6 and presented on Figure 6C. The results of the analyses indicated the following exceedances of the Table 2 SCS:

Table 6-5: Summary of PHCs in Soil

Sample ID	Sample Depth (mbgs)	Parameter	Units	Table 2 SCS	Reported Value
BH19-12 SS2	0.8-1.4	PHC (F1-BTEX)	µg/g	55	69
		PHC (F2)	µg/g	98	1100
BH19-13 SS4	2.3-2.9	PHC (F2)	µg/g	98	240

6.6.3 Volatile Organic Compounds

A total of five (5) samples were submitted for analysis of VOCs. The results of the analyses are tabulated in Table 7 and presented on Figure 6D. The results of the chemical analyses conducted indicated that all samples analyzed met the applicable Site Condition Standards.

6.6.4 Polycyclic Aromatic Hydrocarbons

A total of five (5) samples, including one (1) field duplicate for QA/QC purposes were submitted for analysis of PAHs. The results of the analyses are tabulated in Table 8 and presented on Figure 6E. The results of the chemical analyses conducted indicated that all samples analyzed met the applicable Site Condition Standards.

6.6.5 Commentary on Soil Quality

EC and SAR impacts were identified in the surface soil (0-0.6 mbgs) samples analysed from boreholes BH19-12, BH18-18 and BH19-19. The source of these impacts is attributed to the use of fill material of unknown quality. The vertical extent of the EC and SAR impacts in soil is currently unknown. Additional horizontal and vertical delineation will be required for the purposes of a future RSC submission.

PHC impacts were identified in boreholes BH19-12 and BH19-13 at depths ranging between 0.8 to 2.9 mbgs. The vertical extent of the PHC impacts was determined to be approximately 2.3 mbgs in borehole BH19-12. The vertical extent of the PHC impact in borehole BH19-13 is currently unknown. Additional horizontal and vertical delineation will be required for the purposes of a future RSC submission.

6.7 Ground Water Quality

The results of the chemical analyses conducted are presented in Tables 9 through 11. A visual summary of the location of the sample locations is provided in Figures 7A through 7C. The laboratory certificates of analysis have been provided under Appendix D.

6.7.1 Metals and ORPs

A total of five (5) samples, including one (1) field duplicate for QA/QC purposes were submitted for analysis of metals and ORPs. The results of the analyses are tabulated in Table 9 and presented on Figure 7A. The groundwater samples transferred into the metals, mercury, and hexavalent chromium bottles were field filtered using a 0.45-micron in-line filter. The results of the analyses indicated the following exceedances of the Table 2 SCS:

Table 6-6: Summary of Metals and ORPs Exceedances in Groundwater

Sample ID	Well Screen Interval (mbgs)	Parameter	Units	Table 2 SCS	Reported Value
BH19-15	2.4-5.5	Cobalt	µg/L	3.8	4.3
BH19-18	3.1-6.2	Sodium	µg/L	490000	510000
		Chloride	mg/L	790	1200

6.7.2 Petroleum Hydrocarbons

A total of five (5) samples, including one (1) field duplicate for QA/QC purposes were submitted for analysis of PHCs (incl. BTEX). The results of the analyses are tabulated in Table

10 and presented on Figure 7B. The results of the chemical analyses conducted indicated that all samples analyzed met the applicable Site Condition Standards.

6.7.3 Volatile Organic Compounds

A total of five (5) samples, including one (1) field duplicate for QA/QC purposes were submitted for analysis of VOCs. The results of the analyses are tabulated in Table 11, and presented on Figure 7C. The results of the chemical analyses conducted indicated that all samples analyzed met the applicable Site Condition Standards.

6.7.4 Commentary on Groundwater Quality

The reported concentrations of cobalt in the groundwater obtained from monitoring well BH19-15 marginally exceeded the Table 2 SCS. Similarly, the reported concentrations of sodium and chloride in groundwater obtained from monitoring well BH19-18 marginally exceeded the Table 2 SCS.

Based on the results of the groundwater sampling conducted, it does not appear that the PHC impacts identified in soil are adversely affecting the groundwater quality on the Property. It is possible that the EC and SAR impacts identified in soil at borehole BH19-18 is acting as a source of contaminant mass for sodium and chloride in groundwater.

6.8 Sediment Quality

No sediment was present on the Phase Two Property at the time of the investigation.

6.9 Quality Assurance and Quality Control Results

Collection of soil and groundwater samples was conducted in general accordance with the MECP *Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*. As described in Section 5.12, dedicated equipment was used where possible, and all non-dedicated equipment was decontaminated before and between sampling events. All soil and groundwater samples were transferred directly into laboratory-supplied containers. The laboratory containers were prepared by the laboratory with suitable preservative, as required. All samples were stored and transported under refrigerated conditions. Chain of custody protocols were maintained from the time of sampling to delivery to the analytical laboratory.

The field QA/QC program involved the collection of field duplicate soil and groundwater samples, and the use of a trip blank for each groundwater sampling event (when suitable). In addition to the controls listed above, the analytical laboratory employed method blanks,

internal laboratory duplicates, surrogate spike samples, matrix spike samples, and standard reference materials.

A summary of the field duplicate samples analyzed and an interpretation of the efficacy of the QA/QC program is provided in the table below.

Table 6-7: Summary of QA/QC Results

Sample ID	QA/QC duplicate	Medium	Parameter Analyzed	QA/QC Result
Dup-3	BH19-13 SS1	Soil	PAHs	All results were within the analytical protocol criteria for RPD, except for the parameters listed below.
Dup-4	BH19-17 SS2	Soil	PHCs	All results were within the analytical protocol criteria for RPD
Dup-E	BH19-12	Groundwater	M&I, PHCs, VOCs	All results were within the analytical protocol criteria for RPD

The following exceptions in the RPD protocols were identified:

- ❖ The RPD value for BH19-13 SS1(Dup-3) of 32% exceeded the recommended 30% RPD limit for Benzo(b/j)fluoranthene. The variance in the analytical result between the parent and duplicate sample are attributed to the heterogeneity of the fill material analyzed.
- ❖ The RPD value for BH19-13 SS1(Dup-3) of 68% exceeded the recommended 30% RPD limit for Phenanthrene. The variance in the analytical result between the parent and duplicate sample are attributed to the heterogeneity of the fill material analyzed.

Based on the interpretation of the laboratory results and the QA/QC program, it is the opinion of the QP that the laboratory analytical data can be relied upon.

All samples were handled in accordance with the MECP Analytical Protocol regarding sample holding time, preservation methods, storage requirements, and type of container.

Maxxam routinely conducts internal QA/QC analyses in order to satisfy regulatory QA/QC requirements. The results of the Maxxam QA/QC analyses for the submitted soil samples are summarized in the laboratory Certificates of Analyses provided in Appendix D.

With respect to subsection 47(3) of O. Reg 153/04 (as amended), all certificates of analysis or analytical reports pursuant to clause 47(2) (b) of the regulation comply with subsection 47(3). A certificate of analysis has been received for each sample submitted for analysis and have been provided (in full) in Appendix D.

A review of the QA/QC sample results indicated that no issues were identified with respect to both the field collection methodology and the laboratory reporting. It is the opinion of the

QP that the analytical data obtained are representative of the soil and groundwater conditions at the Phase Two Property for the purpose of assessing whether the soil and groundwater at the Phase Property meets the applicable MECP SCS.

6.10 Phase Two Conceptual Site Model

This Phase Two Conceptual Site Model was developed through a synthesis of the information obtained through the completion of the Phase One ESA, and the data collected as part of the Phase Two ESA.

I. Description and Assessment of:

A. Areas where potentially contaminating activity has occurred

A total of nine (9) PCAs were identified in the Phase One ESA. A summary of the PCAs considered to be contributing to APECs on the Phase Two Property is provided in the table below.

PCA Item.	PCA Description (Per. Table 2, Schedule D of O.Reg. 153/04)	Description	Contributing to APEC (Y/N)
1	PCA-30: Importation of Fill Material of Unknown Quality	The previous geotechnical investigations identified fill material on both parcels.	Yes – APEC-1
2	PCA-28: Gasoline and associated products storage in fixed tanks	A total of three (3) ASTs were previously reported adjacent to Site Building E on Parcel F.	Yes – APEC-5
3	PCA-28: Gasoline and associated products storage in fixed tanks	A total of two (2) ASTs were previously reported adjacent to Site Building I on Parcel E.	Yes – APEC-6
4	PCA-28: Gasoline and associated products storage in fixed tanks	One (1) AST and one propane tank were previously reported adjacent to Site Building A on Parcel F.	Yes – APEC-7
5	PCA-28: Gasoline and associated products storage in fixed tanks	A generator is present adjacent to the cell tower observed on the western portion of Parcel E.	Yes – APEC-3
6	PCA-28: Gasoline and associated products storage in fixed tanks	One (1) fuel oil AST was historically located in the basement of Site Building H according to the Site Interviews.	Yes – APEC-8
7	PCA-58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners.	6314 Ninth Line (Parcel E) was registered with the MECP for waste oils and lubricants in the 1980s and 1990s, as identified in the previous reports and the EcoLog ERIS Report.	Yes – APEC-3
8	PCA-52: Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems	6314 Ninth Line (Parcel E) was used as a vehicle and boat storage facility, identified by the previous reports and confirmed by the site reconnaissance.	Yes – APEC-2

PCA Item.	PCA Description (Per. Table 2, Schedule D of O.Reg. 153/04)	Description	Contributing to APEC (Y/N)
9	PCA-40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, and Bulk Storage	The north adjacent property and south neighboring lands were used for agricultural purposes. It is anticipated that glyphosate, or a similar product, was used. This compound has a tendency to adsorb strongly to soils and is not expected to leach into non-target areas.	No – Due to the off-site use.

Table 6-8: Summary of PCAs Contributing to APECs

N/S - not specified in Table 2, Schedule D, of O.Reg. 153/04

B. Areas of potential environmental concern

A total of eight (8) APECs were identified to be present on the Phase Two Property through the completion of the Phase One ESA. A summary of the APECs identified, and the associated PCOCs is provided in the table below.

Table 6-9: Summary of APECs

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA-30: Importation of Fill Material of Unknown Quality -Historical Importation of fill material for grading purposes	On Site	Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil
APEC-2	Western portion of Parcel E	PCA-52: Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems -Parcel E was used for vehicle storage and maintenance.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-3	Western portion of Parcel E	PCA-58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	On-Site	PHCs (F1-F4), BTEX, PAHs	Soil
				PHCs (F1-F4), BTEX	Groundwater

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
		- Parcel E was registered for waste oils and lubricants in the 1980s and 1990s.			
APEC-4	Southwest corner of Parcel E	PCA-28: Gasoline and associated products storage in fixed tanks -a generator associated with a cell tower is located on the western side of Parcel E.	On Site	PHCs, PAHs	Soil
APEC-5	South-west central portion of Parcel F in the vicinity of Site Building E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of three (3) ASTs identified in the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-6	On the south-side of Site Building I on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of two (2) ASTs identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-7	On the south-east exterior of Site Building B on Parcel F	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) AST identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-8	Within the vicinity of Site Building H on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) fuel oil AST in the basement of Site Building H identified by the Site Interview.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water

C. Any subsurface structures and utilities on, in or under the Phase Two Property that may affect contaminant distribution and transport

A perched water unit was observed within the fill material, situated atop the relatively low permeability clayey silt till unit. The groundwater table is inferred to be located within the clayey silt till unit, at depths ranging between 2-3 mbgs.

Buried utility services are present on the eastern portion of the Phase Two Property and are inferred to be situated at depths ranging between 2 and 3 mbgs. All boreholes were advanced in the central and western portion of the Phase Two Property. Groundwater impacts were not identified within the immediate vicinity of these buried services, as such it is in the opinion of the QP that these utility services are unlikely to be acting as conduits for preferential migration of contaminants.

II. Description of, and as appropriate, figures illustrating, the physical setting of the Phase Two Property and any areas under it including:

A. Stratigraphy from ground surface to the deepest aquifer or aquitard investigated

Fill material approximately 1.5 to 2.3 m in thickness was encountered in all of the boreholes advanced. The fill material was generally heterogeneous and consisted of asphalt, silty sand, sandy silt, clay, and clayey silt with trace rootlets and inorganics. Woodchips were present in the fill material of BH19-16 and BH19-17. The native overburden material encountered below the fill material consisted of clayey silt till, extending to a maximum explored depth of 6.6 mbgs. Shale bedrock was not encountered in the boreholes advanced on the Phase Two Property.

The borehole locations are depicted on Figure 4.

B. Hydrogeological Characteristics, including aquifers, aquitards and, in each hydrostratigraphic unit where one or more contaminants is present at concentrations above the applicable site condition standards, lateral and vertical gradients

The groundwater table was encountered in a clayey silt till unit, which is considered to be a unconfined aquifer.

Based on the groundwater elevations, the groundwater flow direction is interpreted to be east towards the Osprey Marsh. The average hydraulic gradient was calculated to be 0.02. The vertical hydraulic gradient could not be calculated at this time.

C. Depth to bedrock

Bedrock was not encountered in any of the boreholes advanced on the Phase Two Property to a maximum depth of 6.6 m. Based on a review of MECP water well records on adjacent properties, the depth to bedrock on the Phase Two Property is inferred to be greater than 16 mbgs.

D. Approximate depth to water table

The depth to groundwater was found to range between 0.41 to 1.33 mbgs on May 23, 2019.

E. Any respect in which section 41 or 43.1 of the regulation applies to the property

The pH values measured were within the acceptable limits for non-sensitive sites. There are no areas of natural significance on the Phase Two Property, or within 30 m of the Phase Two Property. As such the Phase Two Property is not considered to be environmentally sensitive as defined by Section 41.

F. Areas where soil has been brought from another property and placed on, in or under the Phase Two Property

No fill material was imported to the Phase Two Property during the course of this investigation.

G. Approximate locations, if known, of any proposed buildings and other structures

It is our understanding that redevelopment of the Site for residential purposes has been proposed. It is further understood that the proposed development will occupy the northern and central portions of the Property.

III. Where a contaminant is present on, in or under the Phase Two Property at a concentration greater than the applicable site condition standard, identification of

A. Each area where a contaminant is present on, in or under the Phase Two Property at a concentration greater than the applicable SCS

A summary of the chemical analysis conducted and the exceedances of the Table 2 SCS are presented on Figures 6A through 7B.

Metals and ORPs

EC and SAR impacts were identified in three of the eight soil sample locations at depths ranging from 0 to 0.6 mbgs. Generally, the soil impacts were identified within the fill material.

Cobalt impacts and sodium and chloride impacts were identified in monitoring wells BH19-15 and BH19-18 respectively.

PHCs (incl. BTEX)

Chemical exceedances were identified in two of the seven soil sample locations at depths ranging from 0.8 to 2.9 mbgs. Generally, the soil impacts were identified within the lower fill material and upper clayey silt till unit.

All groundwater samples collected in 2019 met the applicable Table 2 SCS.

VOCs

All samples analyzed met the Table 2 SCS.

PAHs

All samples analyzed met the Table 2 SCS.

B. The contaminants associated with each of the areas

A summary of the contaminants identified are present on Figure 6A, 6B and 7A. The contaminants identified included EC, SAR, PHCs (F1-BTEX), PHCs(F2), cobalt, sodium and chloride.

C. Medium that contaminants were identified in

Contaminants were identified at concentrations greater than the applicable SCS in soil and groundwater as part of the 2019 investigation.

D. Description and assessment of what is know about each of the areas

The horizontal extent of the impacts identified are presented on Figures 6A, 6B and 7A. The vertical extent of the PHC impacts identified in BH19-12 is inferred to be 2.3 mbgs, based on the analytical data available at this time. The vertical extent of the PHC impacts identified in BH19-13 is unknown at this time. The vertical and horizontal distribution of the Metals and ORPs impacts identified in groundwater is unknown at this time.

E. Distribution in which the areas of each contaminant is present in the area at a concentration greater than the applicable SCS, for each medium

in which the contaminant is present, together with figures showing the distribution

The horizontal extent of the impacts identified are presented on Figures 6A, 6B and 7A. The vertical extent of the ORP and PHC impacts is currently unknown.

F. Anything know about the reason for the discharge of the contaminants present on, in or under the Phase Two Property at a concentrations greater than the applicable SCS

The metals and ORPs impacts identified in soil are attributed to the fill material present on the Property. The PHC impacts identified in BH19-12 and BH19-13 appear to be the result of maintenance of motor vehicles in Site Building I.

G. Anything known about migration of the contaminants present on, in or under the phase two property at a concentration greater than the applicable SCS away from any area of potential environmental concern, including the identification of any preferential pathways

The soil impacts were identified in separate, discreet areas of the Property. There is no indication of mobilization of contaminants at this time. The clayey silt till unit is inferred to be of low hydraulic conductivity and is therefore likely to limit the mobility of the contaminants identified.

H. Climatic or meteorological conditions that may have influenced distribution and migration of the contaminants, such as temporal fluctuations in groundwater levels

Three (3) groundwater level measurements were recorded throughout the course of this investigation. The groundwater levels were found to fluctuate by a maximum of 1.74 m between May 17 and May 23, 2019. Groundwater levels can only be confirmed through long term monitoring.

I. Information concerning soil vapour intrusion of the contaminants into buildings

No habitable site buildings are currently present in the vicinity of the volatile (PHC) impacts identified in boreholes BH19-12 and BH19-13. The impacted soil will require remediation prior to redevelopment, as such the presence of the PHC impacts is not considered to present concern to the future occupants of the Property.

IV. Where contaminants on, in or under the Phase Two Property are present at concentrations greater than the applicable SCS, one or more cross-sections showing

- A. The lateral and vertical distribution of a contaminant in each area where the contaminants are present at concentrations greater than the applicable SCS in soil, groundwater and sediment**
- B. Approximate depth to water table**
- C. Stratigraphy from ground surface to the deepest aquifer or aquitard investigated**
- D. Any subsurface structures and utilities that may affect contaminants distribution and transport**

Additional delineation is required. Cross-sections will be prepared once all required investigation has been completed.

V. For each area where a contaminant is present on, in or under the property at a concentration greater than the applicable SCS for the contaminant, a diagram identifying, with narrative explanatory notes

- A. The release mechanisms**
- B. Contaminant transport pathway**
- C. The human and ecological receptors located on, in or under the phase two property**
- D. Receptor exposure points**
- E. Routes of exposure**

Refer to Figure 8.

7.0 Conclusions

This Phase Two ESA involved that advancement of eight (8) boreholes, the installation of four (4) monitoring wells on the Phase, and the collection of soil and groundwater samples for analysis of the potential contaminants of concern, including: PHC (F1-F4), VOCs, Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, and PAHs.

Based on the results of the information gathered through the course of the investigation, DS presents the following conclusions:

- ◆ EC, SAR and PHC impacts were identified in soil. Generally, the EC and SAR impacts were identified within the fill material. The vertical extent of the EC and SAR impacts is currently unknown. The vertical extent of the PHC impacts identified in BH19-12 is

inferred to be 2.3 mbgs, based on the analytical data available at this time. The vertical extent of the PHC impacts identified in BH19-13 is currently unknown. Additional delineation and remediation of the impacted soils will be required in order to support the filing of an RSC for the Property.

- ◆ Marginally elevated concentrations of Cobalt, sodium and chloride in excess of the Table 2 SCS were identified two (2) of the four (4) monitoring wells. Additional groundwater sampling is recommended at this time to confirm the concentrations of metals and ORPs in groundwater.
- ◆ The results of this Phase Two ESA indicate that the applicable Site Condition Standards have not been met. Additional delineation will be required in order to further assess the horizontal and vertical extent of the metals/ORPs and PHC impacts in soil. Additional groundwater sampling is recommended in order to confirm the groundwater quality on-Site.
- ◆ All monitoring wells should be decommissioned in accordance with O.Reg. 903 when no longer required.

7.1 Qualifications of the Assessors

Tanner Leonhardt, EIT.

Mr. Leonhardt is an environmental technician with DS Consultants Limited. Tanner holds a Bachelor of Engineering Degree from the University of Guelph and has several years of experience working in the environmental industry. Tanner has experience in conducting Phase One and Phase Two Environmental Site Assessments, soil and groundwater remediation, and has supported several risk assessment projects.

Mr. Patrick (Rick) Fioravanti, B.Sc., P.Geo., QP_{ESA}

Mr. Fioravanti an Environmental Project Manager with DS Consultants Limited. Patrick holds a Honours Bachelor of Science with distinction in Toxicology from the University of Guelph, and is a practicing member of the Association of Professional Geoscientists of Ontario (APGO). Patrick has over seven years of environmental consulting experience and has conducted and/or managed over 100 projects in his professional experience. Patrick has extensive experience conducting Phase One and Phase Two Environmental Site Assessments in support of brownfields redevelopment in urban settings, and been involved in numerous remediation projects, supported many risk assessments, and successfully filed Records of Site Condition with the Ministry of Environment and Climate Change. He has conducted work across southern and eastern Ontario, and Quebec in his professional experience. Patrick is considered a Qualified Person to conduct Environmental Site Assessments as defined by Ontario Regulation 153/04 (as amended).

7.2 Signatures

This Phase Two ESA was conducted under the supervision of Patrick Fioravanti, B.Sc., P.Geo., QP_{ESA} in accordance with the requirements of O.Reg. 153/04 (as amended). The findings and conclusions presented have been determined based on the information obtained at the time of the investigation, and on an assessment of the conditions of the Site at this time.

We trust this report meets with your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

DS Consultants Ltd



Tanner Leonhardt, EIT.
Environmental Technician



Patrick Fioravanti, B.Sc., P.Geo., QP_{ESA}
Manager – Environmental Services

7.3 Limitations

This report was prepared for the sole use of Derry Britannia Developments Limited and is intended to provide an assessment of the environmental condition on the property located at 6302 and 6314 Ninth Line (Parcels E and F), Mississauga, Ontario. The information presented in this report is based on information collected during the completion of the Phase Two Environmental Site Assessment by DS Consultants Ltd. The material in this report reflects DS' judgment in light of the information available at the time of report preparation. This report may not be relied upon by any other person or entity without the written authorization of DS Consultants Ltd. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this documents or findings, conclusions and recommendations represented herein, is at the sole risk of said users.

The conclusions drawn from the Phase Two ESA were based on information at selected observation and sampling locations. Conditions between and beyond these locations may become apparent during future investigations or on-site work, which could not be detected or anticipated at the time of this investigation. The sampling locations were chosen based upon a cursory historical search, visual observations and limited information provided by persons knowledgeable about past and current activities on this site during the Phase Two ESA activities. As such, DS Consultants Ltd. cannot be held responsible for environmental conditions at the site that was not apparent from the available information.

8.0 References

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Tables



Table 1: Summary of Monitoring Well Installation and Groundwater Data

Well ID			BH19-12	BH19-15	BH19-17	BH19-18
Installed By:			DS	DS	DS	DS
Installation Date:			13-May-19	13-May-19	14-May-19	14-May-19
Well Status:			Active	Active	Active	Active
Inner Diameter	(mm)		50	50	50	50
Surface Elevation	(masl)		190.87	191.10	190.99	190.90
Bottom of Concrete Seal/Top of Bentonite Seal	mbgs		0.00	0.00	0.00	0.00
	masl		190.87	191.10	190.99	190.90
Bottom of Bentonite Seal/Top of Sand Pack	mbgs		1.80	1.80	2.10	2.40
	masl		189.07	189.30	188.89	188.50
Top of Well Screen	mbgs		2.40	2.40	2.70	3.10
	masl		188.47	188.70	188.29	187.80
Well Screen Length	m		3.10	3.10	3.10	3.10
Bottom of Well Screen	mbgs		5.50	5.50	5.80	6.20
	masl		185.37	185.60	185.19	184.70
GW Monitoring						
17-May-19	Depth to GW	mbgs	0.89	0.41	0.51	0.63
	GW Elevation	masl	189.98	190.69	190.48	190.27
22-May-19	Depth to GW	mbgs	0.60	0.55	0.60	2.37
	GW Elevation	masl	190.27	190.55	190.39	188.53
23-May-19	Depth to GW	mbgs	0.62	0.53	0.41	1.33
	GW Elevation	masl	188.45	188.77	188.48	187.17

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 2: Summary of Soil Samples Submitted for Chemical Analysis

Borehole ID	Sample No.	Sample Depth (mbgs)	Soil Description	Parameter Analyzed	APEC Investigated
BH19-12	SS1	0-0.6	Fill - silty sand	Metals & ORPs	APEC-1, APEC-2, APEC-3, APEC-6
	SS2	0.8-1.4	Fill - clayey silt	PHCs, VOCs, PAHs	APEC-1, APEC-2, APEC-3, APEC-6
	SS4	2.3-2.9	Clayey Silt Till	PHCs	APEC-1, APEC-2, APEC-3, APEC-6
BH19-13	SS1	0-0.6	Fill - clay	Metals & ORPs, PAHs	APEC-1, APEC-2, APEC-3, APEC-6
	SS2	0.8-1.4	Fill - clay	PHCs, VOCs	APEC-1, APEC-2, APEC-3, APEC-6
	SS4	2.3-2.9	Clayey Silt Till	PHCs	APEC-1, APEC-2, APEC-3, APEC-6
BH19-14	SS2	0.8-1.4	Fill - clayey silt	Metals & ORPs, PHCs, VOCs	APEC-1, APEC-8
BH19-15	SS1	0-0.6	Fill - sandy silt	Metals & ORPs	APEC-1, APEC-2, APEC-3
	SS2	0.8-1.4	Fill - clayey silt	PHCs, VOCs	APEC-2, APEC-3, APEC-4
BH19-16	SS2	0.8-1.4	Fill - clayey silt	Metals & ORPs, PAHs	APEC-1
BH19-17	SS1	0-0.6	Fill - silty sand	Metals & ORPs	APEC-1, APEC-5
	SS2	0.8-1.4	Fill - clayey silt	PHCs, VOCs	APEC-5
BH19-18	SS1	0-0.6	Fill - gravel to sand	Metals & ORPs, PAHs	APEC-1, APEC-7
BH19-19	SS2	0.8-1.4	Fill - clayey silt	Metals & ORPs	APEC-1

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 3: Summary of Groundwater Samples Submitted for Chemical Analysis

Well ID	Well Screen Interval (masl)	Sample Date	Parameter Analyzed	APEC Investigated
BH19-12	185.37 - 188.47	22-May-19	M&I, PHCs, VOCs	APEC-6
BH19-15	185.60 - 188.70	22-May-19	M&I, PHCs, VOCs	APEC-4
BH19-17	185.19 - 188.29	22-May-19	M&I, PHCs, VOCs	APEC-5
BH19-18	184.70 - 187.80	22-May-19	M&I, PHCs, VOCs	APEC-7

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 4: Summary of APECs Investigated

APEC	Description	PCOCs	Media	Boreholes Within APEC		Samples Analysed	Parameter Analyzed
APEC-1	Historical importation of fill material for land grading purposes.	Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil	BH19-12	SS1		Metals & ORPs
					SS2		PHCs, VOCs, PAHs
					SS4		PHCs
				BH19-13	SS1		Metals & ORPs, PAHs
					SS2		PHCs, VOCs
					SS4		PHCs
				BH19-14	SS2		Metals & ORPs, PHCs, VOCs
				BH19-15	SS1		Metals & ORPs
					SS2		PHCs, VOCs
				BH19-16	SS2		Metals & ORPs, PAHs
				BH19-17	SS1		Metals & ORPs
					SS2		PHCs, VOCs
				BH19-18	SS1		Metals & ORPs, PAHs
				BH19-19	SS2		Metals & ORPs
APEC-2	Parcel E was used for vehicle storage and maintenance.	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil	BH19-12	SS1		Metals & ORPs
					SS2		PHCs, VOCs, PAHs
					SS4		PHCs
				BH19-13	SS1		Metals & ORPs, PAHs
					SS2		PHCs, VOCs
					SS4		PHCs
				BH19-15	SS1		Metals & ORPs
					SS2		PHCs, VOCs
APEC-3	Parcel E was registered for waste oils and lubricants in the 1980s and 1990s.	PHCs (F1-F4), BTEX, PAHs	Soil	BH19-12	SS1		Metals & ORPs
					SS2		PHCs, VOCs, PAHs
					SS4		PHCs
				BH19-13	SS1		Metals & ORPs, PAHs
					SS2		PHCs, VOCs
					SS4		PHCs
				BH19-15	SS1		Metals & ORPs
					SS2		PHCs, VOCs
		PHCs (F1-F4), BTEX	Groundwater	BH19-12		Metals & ORPs, PHCs, VOCs	
				BH19-15		Metals & ORPs, PHCs, VOCs	
APEC-4	A generator associated with a cell tower is located on the western side of Parcel E.	PHCs, PAHs	Soil	BH19-15	SS2	PHCs, VOCs	
			Groundwater	BH19-15		Metals & ORPs, PHCs, VOCs	



Table 4: Summary of APECs Investigated

APEC	Description	PCOCs	Media	Boreholes Within APEC	Samples Analysed	Parameter Analyzed
APEC-5	Historical use and presence of three (3) ASTs identified in the previous reports.	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil	BH19-17	SS1	Metals & ORPs
					SS2	PHCs, VOCs
			Groundwater	BH19-17		Metals & ORPs, PHCs, VOCs
APEC-6	Historical use and presence of two (2) ASTs identified by the previous reports.	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil	BH19-12	SS1	Metals & ORPs
					SS2	PHCs, VOCs, PAHs
					SS4	PHCs
			Groundwater	BH19-13	SS1	Metals & ORPs, PAHs
					SS2	PHCs, VOCs
					SS4	PHCs
APEC-7	Historical use and presence of one (1) AST identified by the previous reports.	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil	BH19-18	SS1	Metals & ORPs, PAHs
			Groundwater	BH19-18		Metals & ORPs, PHCs, VOCs
APEC-8	Historical use and presence of one (1) fuel oil AST in the basement of Site Building H identified by the Site Interview.	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil	BH19-14	SS2	Metals & ORPs, PHCs, VOCs

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 5: Summary of Metals and ORPs in Soil

Parameter	MECP Table 2 Fine	BH19-12 SS1	BH19-13 SS1	BH19-14 SS2	BH19-15 SS1	BH19-16 SS2	BH19-17 SS1
Date of Collection		15-May-19	15-May-19	15-May-19	15-May-19	15-May-19	15-May-19
Date Reported		28-May-19	28-May-19	28-May-19	28-May-19	28-May-19	28-May-19
Sampling Depth (mbgs)		0-0.6	0-0.6	0.8-1.4	0-0.6	0.8-1.4	0-0.6
Analytical Report Reference No.		JTM680	JTM683	JTM686	JTM687	JTM689	JTM690
Antimony	7.5	0.29	0.22	<0.20	0.27	<0.20	<0.20
Arsenic	18	5.4	5.3	6.3	3.8	4.2	3.6
Barium	390	46	100	130	61	110	86
Beryllium	5	0.5	0.92	1.1	0.54	0.91	0.58
Boron (Hot Water Soluble)	1.5	0.44	0.5	0.17	0.46	0.76	0.11
Cadmium	1.2	0.34	0.23	0.17	0.27	0.23	<0.10
Chromium	160	20	25	32	18	25	20
Chromium VI	10	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	22	8.6	13	17	7.8	11	11
Copper	180	34	23	29	22	20	21
Lead	120	30	22	15	25	15	8.3
Mercury	1.8	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Molybdenum	6.9	0.73	0.58	<0.50	<0.50	<0.50	<0.50
Nickel	130	19	24	36	16	23	20
Selenium	2.4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.11	0.15	0.2	0.11	0.14	0.12
Vanadium	86	24	38	46	26	38	28
Zinc	340	120	93	74	68	77	45
pH (pH Units)	NV	7.48	7.39	7.31	7.33	7.03	7.68
Conductivity (ms/cm)	0.7	1.7	0.37	0.26	0.58	0.3	0.16
Sodium Adsorption Ratio	5	18	4.1	1.4	1.8	0.38	0.92
Cyanide, Free	0.051	0.03	0.03	<0.01	0.05	0.05	<0.01
Boron (Total)	120	8.1	8.5	11	7.2	7.5	7.3
Uranium	23	0.53	1.1	0.7	0.66	1.5	0.54

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section



Table 5: Summary of Metals and ORPs in Soil

Parameter	MECP Table 2 Fine	BH19-18 SS1	BH19-19 SS1
Date of Collection		15-May-19	15-May-19
Date Reported		28-May-19	28-May-19
Sampling Depth (mbgs)		0-0.6	0-0.6
Analytical Report Reference No.	JTM692	JTM693	
Antimony	7.5	0.21	<0.20
Arsenic	18	5	3.9
Barium	390	98	90
Beryllium	5	0.8	0.87
Boron (Hot Water Soluble)	1.5	0.45	0.094
Cadmium	1.2	0.23	0.11
Chromium	160	24	23
Chromium VI	10	<0.2	<0.2
Cobalt	22	11	12
Copper	180	27	28
Lead	120	22	12
Mercury	1.8	<0.050	<0.050
Molybdenum	6.9	0.6	<0.50
Nickel	130	24	28
Selenium	2.4	<0.50	<0.50
Silver	25	<0.20	<0.20
Thallium	1	0.15	0.17
Vanadium	86	35	34
Zinc	340	78	62
pH (pH Units)	NV	7.41	7.65
Conductivity (ms/cm)	0.7	1.2	0.74
Sodium Adsorption Ratio	5	5.9	0.87
Cyanide, Free	0.051	0.02	<0.01
Boron (Total)	120	9.4	9
Uranium	23	0.65	0.67

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section



Table 6: Summary of PHCs in Soil

Parameter	MECP Table 2 SCS	BH19-12 SS2	BH19-12 SS4	BH19-13 SS2	BH19-13 SS4	BH19-14 SS2	BH19-15 SS2	BH19-17 SS2	Dup-4
Date of Collection		15-May-19	15-May-19	15-May-19	15-May-19	15-May-19	15-May-19	15-May-19	15-May-19
Date Reported		28-May-19	28-May-19	28-May-19	28-May-19	28-May-19	28-May-19	28-May-19	28-May-19
Sampling Depth (mbgs)		0.8-1.4	2.3-2.9	0.8-1.4	2.3-2.9	0.8-1.4	0.8-1.4	0.8-1.4	0.8-1.4
Analytical Report Reference No.		JTM681	JTM682	JTM684	JTM685	JTM686	JTM688	JTM691	JTM695
Benzene	0.17	-	<0.020	-	<0.020	-	-	-	-
Ethylbenzene	1.6	-	<0.020	-	<0.020	-	-	-	-
Toluene	6	-	<0.020	-	<0.020	-	-	-	-
Xylenes (Total)	25	-	<0.040	-	<0.040	-	-	-	-
F1-BTEX	65	69	<10	13	11	<10	<10	<10	-
F2 (C10-C16)	150	1100	<10	120	240	<10	<10	<10	<10
F3 (C16-C34)	1300	620	<50	56	120	<50	<50	<50	<50
F4 (C34-C50)	5600	<50	<50	<50	<50	<50	<50	<50	<50

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section



Table 7: Summary of VOCs in Soil

Parameter	MECP Table 2 Fine	BH9-12 SS2	BH19-13 SS2	BH19-14 SS2	BH19-15 SS2	BH19-17 SS2
Date of Collection		15-May-19	15-May-19	15-May-19	15-May-19	15-May-19
Date Reported		28-May-19	28-May-19	28-May-19	28-May-19	28-May-19
Sampling Depth (mbgs)		0.8-1.4	0.8-1.4	0.8-1.4	0.8-1.4	0.8-1.4
Analytical Report Reference No.		JTM681	JTM684	JTM686	JTM688	JTM691
Acetone	28	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	0.17	<0.020	<0.020	<0.020	<0.020	<0.020
Bromodichloromethane	1.9	<0.050	<0.050	<0.050	<0.050	<0.050
Bromoform	0.26	<0.050	<0.050	<0.050	<0.050	<0.050
Bromomethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
Carbon Tetrachloride	0.12	<0.050	<0.050	<0.050	<0.050	<0.050
Chlorobenzene	2.7	<0.050	<0.050	<0.050	<0.050	<0.050
Chloroform	0.17	<0.050	<0.050	<0.050	<0.050	<0.050
Dibromochloromethane	2.9	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichlorobenzene	1.7	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-Dichlorobenzene	6	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-Dichlorobenzene	0.097	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethane	0.6	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichloroethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-Dichloroethylene	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
Cis-1,2-Dichloroethylene	2.5	<0.050	<0.050	<0.050	<0.050	<0.050
Trans-1,2-Dichloroethylene	0.75	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-Dichloropropane	0.085	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	1.6	0.13	<0.020	<0.020	<0.020	<0.020
Ethylene Dibromide	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Ethyl Ketone	44	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	0.96	<0.050	<0.050	<0.050	<0.050	<0.050
Methyl Isobutyl Ketone	4.3	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl-t-Butyl Ether	1.4	<0.050	<0.050	<0.050	<0.050	<0.050
Styrene	2.2	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
Toluene	6	<0.020	<0.020	<0.020	<0.020	<0.020
Tetrachloroethylene	2.3	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,1-Trichloroethane	3.4	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2-Trichloroethane	0.05	<0.050	<0.050	<0.050	<0.050	<0.050
Trichloroethylene	0.52	<0.050	<0.050	<0.050	<0.050	<0.050
Vinyl Chloride	0.022	<0.020	<0.020	<0.020	<0.020	<0.020
Total Xylenes	25	2.3	<0.020	<0.020	<0.020	<0.020
Dichlorodifluoromethane	25	<0.050	<0.050	<0.050	<0.050	<0.050
Hexane(n)	34	<0.050	<0.050	<0.050	<0.050	<0.050
Trichlorofluoromethane	5.8	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-Dichloropropene (cis + trans)	0.081	<0.050	<0.050	<0.050	<0.050	<0.050

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 8: Summary of PAHs in Soil

Parameter	MECP Table 2 Fine	BH19-12 SS2	BH19-13 SS1	BH19-16 SS2	BH19-18 SS1	Dup-3
Date of Collection		15-May-19	15-May-19	15-May-19	15-May-19	15-May-19
Date Reported		28-May-19	28-May-19	28-May-19	28-May-19	28-May-19
Sample Depth (mbgs)		0.8-1.4	0-0.6	0.8-1.4	0-0.6	0-0.6
Analytical Report Reference No.		JTM681	JTM683	JTM689	JTM692	JTM694
Acenaphthene	29	0.32	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	0.17	0.05	<0.010	<0.0050	<0.0050	<0.0050
Anthracene	0.74	0.1	<0.050	<0.0050	<0.0050	<0.020
Benzo(a)anthracene	0.63	<0.0050	<0.0050	<0.0050	<0.010	<0.0050
Benzo(a)pyrene	0.3	<0.0050	<0.0050	<0.0050	0.0053	0.0068
Benzo(b/j)fluoranthene	0.78	<0.0050	0.0088	<0.0050	0.0091	0.013
Benzo(ghi)perylene	7.8	<0.0050	<0.0050	0.0078	0.006	0.011
Benzo(k)fluoranthene	0.78	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Chrysene	7.8	<0.0050	<0.0050	<0.0050	0.0052	0.0055
Dibenzo(a,h)anthracene	0.1	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	0.69	0.047	0.011	0.006	0.013	0.013
Fluorene	69	0.41	<0.050	<0.0050	<0.010	<0.020
Indeno(1,2,3-cd)pyrene	0.48	<0.0050	<0.0050	<0.0050	<0.0050	0.0063
1-Methylnaphthalene	3.4	1.5	<0.050	<0.0050	<0.0050	<0.0050
2-Methylnaphthalene	3.4	1.9	<0.050	<0.0050	<0.0050	<0.010
Naphthalene	0.75	0.28	<0.010	<0.0050	<0.0050	<0.010
Phenanthrene	7.8	0.79	0.031	0.005	0.02	<0.010
Pyrene	78	0.083	0.033	<0.0050	0.011	0.045
Methylnaphthalene, 2-(1-)	3.4	3.4	<0.071	<0.0071	<0.0071	<0.011

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 9: Summary of Metals and ORPs in Groundwater

Parameter	MECP Table 2 Fine	Units	BH19-12	BH19-15	Dup-E	BH19-17	BH19-18
Date of Collection			22-May-19	22-May-19	22-May-19	22-May-19	22-May-19
Date Reported			28-May-19	28-May-19	28-May-19	28-May-19	28-May-19
Screen Interval (mbgs)			2.4-5.5	2.4-5.5	2.4-5.5	2.7-5.8	3.1-6.2
Analytical Report Reference No.			JUG804	JUG805	JUG806	JUG808	JUG807
Antimony	6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	25	µg/L	2.1	1.2	2.2	<1.0	2.3
Barium	1000	µg/L	60	140	57	73	53
Beryllium	4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	5000	µg/L	330	74	310	140	600
Cadmium	2.7	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	50	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0
Chromium VI	25	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Cobalt	3.8	µg/L	1.1	4.3	0.94	2.3	1
Copper	87	µg/L	1.9	2.6	<1.0	2.1	2.9
Lead	10	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	70	µg/L	7.1	1.3	6.7	0.6	6.5
Nickel	100	µg/L	2.7	5	2.3	6.4	1.6
Sodium	490000	µg/L	140000	240000	130000	84000	510000
Selenium	10	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
Silver	1.5	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	2	µg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Vanadium	6.2	µg/L	<0.50	0.63	<0.50	<0.50	<0.50
Zinc	1100	µg/L	<5.0	6.8	<5.0	<5.0	<5.0
Cyanide, Free	66	µg/L	<1	<1	<1	<1	<1
Chloride (mg/L)	790	mg/L	200	370	200	160	1200
Uranium	20	µg/L	1.8	3.7	1.7	3.7	1.5

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 10: Summary of PHCs in Groundwater

Parameter	MECP Table 2 Fine	Units	BH19-12	BH19-15	DUP-E	BH19-17	BH19-18
Date of Collection			22-May-19	22-May-19	22-May-19	22-May-19	22-May-19
Date Reported			28-May-19	28-May-19	28-May-19	28-May-19	28-May-19
Screen Interval (mbgs)			2.4-5.5	2.4-5.5	2.4-5.5	2.7-5.8	3.1-6.2
Analytical Report Reference No.			JUG804	JUG805	JUG806	JUG808	JUG807
Benzene	5	µg/L	-	-	-	-	-
Ethylbenzene	24	µg/L	-	-	-	-	-
Toluene	2.4	µg/L	-	-	-	-	-
Xylenes (Total)	300	µg/L	-	-	-	-	-
F1 (C6 to C10) minus BTEX	750	µg/L	<25	<25	<25	<25	<25
F2 (C10 to C16)	150	µg/L	<100	<100	<100	<100	<100
F3 (C16 to C34)	500	µg/L	<200	<200	<200	<200	<200
F4 (C34 to C50) minus PAHs	500	µg/L	<200	<200	<200	<200	<200

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 11: Summary of VOCs in Groundwater

Parameter	MECP Table 2 Fine	Units	BH19-12	BH19-15	DUP-E
Date of Collection			22-May-19	22-May-19	22-May-19
Date Reported			28-May-19	28-May-19	28-May-19
Screen Interval (mbgs)			2.4-5.5	2.4-5.5	2.4-5.5
Analytical Report Reference No.			JUG804	JUG805	JUG806
Acetone	2700	µg/L	<10	<10	<10
Benzene	5	µg/L	<0.20	<0.20	<0.20
Bromodichloromethane	16	µg/L	<0.50	<0.50	<0.50
Bromoform	25	µg/L	<1.0	<1.0	<1.0
Bromomethane	0.89	µg/L	<0.50	<0.50	<0.50
Carbon Tetrachloride	5	µg/L	<0.20	<0.20	<0.20
Chlorobenzene	30	µg/L	<0.20	<0.20	<0.20
Chloroform	22	µg/L	<0.20	<0.20	<0.20
Dibromochloromethane	25	µg/L	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	3	µg/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	µg/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethane	5	µg/L	<0.20	<0.20	<0.20
1,2-Dichloroethane	5	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethylene	14	µg/L	<0.20	<0.20	<0.20
Cis-1,2-Dichloroethylene	17	µg/L	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	17	µg/L	<0.50	<0.50	<0.50
1,2-Dichloropropane	5	µg/L	<0.20	<0.20	<0.20
Ethylbenzene	2.4	µg/L	0.21	<0.20	<0.20
Ethylene Dibromide	0.2	µg/L	<0.20	<0.20	<0.20
Methyl Ethyl Ketone	1800	µg/L	<10	<10	<10
Methylene Chloride	50	µg/L	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	640	µg/L	<5.0	<5.0	<5.0
Methyl-t-Butyl Ether	15	µg/L	<0.50	<0.50	<0.50
Styrene	5.4	µg/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	µg/L	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	µg/L	<0.50	<0.50	<0.50
Toluene	24	µg/L	<0.20	<0.20	<0.20
Tetrachloroethylene	17	µg/L	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	200	µg/L	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	5	µg/L	<0.50	<0.50	<0.50
Trichloroethylene	5	µg/L	<0.20	<0.20	<0.20
Vinyl Chloride	1.7	µg/L	<0.20	<0.20	<0.20
Total Xylenes	300	µg/L	3.7	<0.20	3.1
Dichlorodifluoromethane	590	µg/L	<1.0	<1.0	<1.0
Hexane(n)	520	µg/L	<1.0	<1.0	<1.0
Trichlorofluoromethane	150	µg/L	<0.50	<0.50	<0.50
1,3-Dichloropropene (cis + trans)	0.5	µg/L	<0.50	<0.50	<0.50

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 11: Summary of VOCs in Groundwater

Parameter	MECP Table 2 Fine	Units	BH19-17	BH19-18	TRIP BLANK
Date of Collection			22-May-19	22-May-19	-
Date Reported			28-May-19	28-May-19	28-May-19
Screen Interval (mbgs)			2.7-5.8	3.1-6.2	-
Analytical Report Reference No.			JUG808	JUG807	JUG809
Acetone	2700	µg/L	18	<10	<10
Benzene	5	µg/L	<0.20	<0.20	<0.20
Bromodichloromethane	16	µg/L	<0.50	<0.50	<0.50
Bromoform	25	µg/L	<1.0	<1.0	<1.0
Bromomethane	0.89	µg/L	<0.50	<0.50	<0.50
Carbon Tetrachloride	5	µg/L	<0.20	<0.20	<0.20
Chlorobenzene	30	µg/L	<0.20	<0.20	<0.20
Chloroform	22	µg/L	<0.20	<0.20	<0.20
Dibromochloromethane	25	µg/L	<0.50	<0.50	<0.50
1,2-Dichlorobenzene	3	µg/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	µg/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethane	5	µg/L	<0.20	<0.20	<0.20
1,2-Dichloroethane	5	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethylene	14	µg/L	<0.20	<0.20	<0.20
Cis-1,2-Dichloroethylene	17	µg/L	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	17	µg/L	<0.50	<0.50	<0.50
1,2-Dichloropropane	5	µg/L	<0.20	<0.20	<0.20
Ethylbenzene	2.4	µg/L	<0.20	<0.20	<0.20
Ethylene Dibromide	0.2	µg/L	<0.20	<0.20	<0.20
Methyl Ethyl Ketone	1800	µg/L	<10	<10	<10
Methylene Chloride	50	µg/L	<2.0	<2.0	<2.0
Methyl Isobutyl Ketone	640	µg/L	<5.0	<5.0	<5.0
Methyl-t-Butyl Ether	15	µg/L	<0.50	<0.50	<0.50
Styrene	5.4	µg/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	µg/L	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	µg/L	<0.50	<0.50	<0.50
Toluene	24	µg/L	<0.20	<0.20	<0.20
Tetrachloroethylene	17	µg/L	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	200	µg/L	<0.20	<0.20	<0.20
1,1,2-Trichloroethane	5	µg/L	<0.50	<0.50	<0.50
Trichloroethylene	5	µg/L	<0.20	<0.20	<0.20
Vinyl Chloride	1.7	µg/L	<0.20	<0.20	<0.20
Total Xylenes	300	µg/L	<0.20	<0.20	<0.20
Dichlorodifluoromethane	590	µg/L	<1.0	<1.0	<1.0
Hexane(n)	520	µg/L	<1.0	<1.0	<1.0
Trichlorofluoromethane	150	µg/L	<0.50	<0.50	<0.50
1,3-Dichloropropene (cis + trans)	0.5	µg/L	<0.50	<0.50	<0.50

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 12: Summary of Maximum Concentrations in Soil

	Parameter	Standard	Maximum Concentration	Location
Metals and ORPs	Antimony	7.5	0.29	BH19-12 SS1
	Arsenic	18	6.3	BH19-14 SS2
	Barium	390	130	BH19-14 SS2
	Beryllium	5	1.1	BH19-14 SS2
	Boron (Hot Water Soluble)	1.5	0.76	BH19-16 SS2
	Cadmium	1.2	0.34	BH19-12 SS1
	Chromium	160	32	BH19-14 SS2
	Chromium VI	10	<0.2	All Samples
	Cobalt	22	17	BH19-14 SS2
	Copper	180	34	BH19-12 SS1
	Lead	120	30	BH19-12 SS1
	Mercury	1.8	<0.050	All Samples
	Molybdenum	6.9	0.73	BH19-12 SS1
	Nickel	130	36	BH19-14 SS2
	Selenium	2.4	<0.50	All Samples
	Silver	25	<0.20	All Samples
	Thallium	1	0.2	BH19-14 SS2
	Vanadium	86	46	BH19-14 SS2
	Zinc	340	120	BH19-12 SS1
	pH (pH Units)	NV	7.68	BH19-17 SS1
	Conductivity (ms/cm)	0.7	1.7	BH19-12 SS1
	Sodium Adsorption Ratio	5	18	BH19-12 SS1
	Cyanide, Free	0.051	0.05	BH19-15 SS1
	Boron (Total)	120	11	BH19-14 SS2
	Uranium	23	1.5	BH19-16 SS2
PHCs	Benzene	0.17	-	All Samples
	Ethylbenzene	1.6	-	All Samples
	Toluene	6	-	All Samples
	Xylenes (Total)	25	-	All Samples
	F1-BTEX	65	69	BH19-12 SS2
	F2 (C10-C16)	150	1100	BH19-12 SS2
	F3 (C16-C34)	1300	620	BH19-12 SS2
	F4 (C34-C50)	5600	<50	All Samples
VOCs	Acetone	28	<0.50	All Samples
	Benzene	0.17	<0.020	All Samples
	Bromodichloromethane	1.9	<0.050	All Samples
	Bromoform	0.26	<0.050	All Samples
	Bromomethane	0.05	<0.050	All Samples
	Carbon Tetrachloride	0.12	<0.050	All Samples
	Chlorobenzene	2.7	<0.050	All Samples
	Chloroform	0.17	<0.050	All Samples
	Dibromochloromethane	2.9	<0.050	All Samples
	1,2-Dichlorobenzene	1.7	<0.050	All Samples
	1,3-Dichlorobenzene	6	<0.050	All Samples



Table 12: Summary of Maximum Concentrations in Soil

	Parameter	Standard	Maximum Concentration	Location
VOCs	1,4-Dichlorobenzene	0.097	<0.050	All Samples
	1,1-Dichloroethane	0.6	<0.050	All Samples
	1,2-Dichloroethane	0.05	<0.050	All Samples
	1,1-Dichloroethylene	0.05	<0.050	All Samples
	Cis-1,2-Dichloroethylene	2.5	<0.050	All Samples
	Trans-1,2-Dichloroethylene	0.75	<0.050	All Samples
	1,2-Dichloropropane	0.085	<0.050	All Samples
	Ethylbenzene	1.6	0.13	BH9-12 SS2
	Ethylene Dibromide	0.05	<0.050	All Samples
	Methyl Ethyl Ketone	44	<0.50	All Samples
	Methylene Chloride	0.96	<0.050	All Samples
	Methyl Isobutyl Ketone	4.3	<0.50	All Samples
	Methyl-t-Butyl Ether	1.4	<0.050	All Samples
	Styrene	2.2	<0.050	All Samples
	1,1,1,2-Tetrachloroethane	0.05	<0.050	All Samples
	1,1,2,2-Tetrachloroethane	0.05	<0.050	All Samples
	Toluene	6	<0.020	All Samples
	Tetrachloroethylene	2.3	<0.050	All Samples
	1,1,1-Trichloroethane	3.4	<0.050	All Samples
	1,1,2-Trichloroethane	0.05	<0.050	All Samples
	Trichloroethylene	0.52	<0.050	All Samples
	Vinyl Chloride	0.022	<0.020	All Samples
	Total Xylenes	25	2.3	BH9-12 SS2
	Dichlorodifluoromethane	25	<0.050	All Samples
	Hexane(n)	34	<0.050	All Samples
	Trichlorofluoromethane	5.8	<0.050	All Samples
	1,3-Dichloropropene (cis + trans)	0.081	<0.050	All Samples
PAHs	Acenaphthene	29	0.32	BH19-12 SS2
	Acenaphthylene	0.17	0.05	BH19-12 SS2
	Anthracene	0.74	0.1	BH19-12 SS2
	Benzo(a)anthracene	0.63	<0.0050	All Samples
	Benzo(a)pyrene	0.3	0.0068	Dup-3
	Benzo(b/j)fluoranthene	0.78	0.013	Dup-3
	Benzo(ghi)perylene	7.8	0.011	Dup-3
	Benzo(k)fluoranthene	0.78	<0.0050	All Samples
	Chrysene	7.8	0.0055	Dup-3
	Dibenzo(a,h)anthracene	0.1	<0.0050	All Samples
	Fluoranthene	0.69	0.047	BH19-12 SS2
	Fluorene	69	0.41	BH19-12 SS2
	Indeno(1,2,3-cd)pyrene	0.48	0.0063	Dup-3
	1-Methylnaphthalene	3.4	1.5	BH19-12 SS2
	2-Methylnaphthalene	3.4	1.9	BH19-12 SS2
	Naphthalene	0.75	0.28	BH19-12 SS2
	Phenanthrene	7.8	0.79	BH19-12 SS2
	Pyrene	78	0.083	BH19-12 SS2
	Methylnaphthalene, 2-(1-)	3.4	3.4	BH19-12 SS2

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.



Table 13: Summary of Maximum Concentrations in Groundwater

	Parameter	Standard	Maximum Concentration	Location
Metals and ORPs	Antimony	6	<0.50	All Samples
	Arsenic	25	2.3	BH19-18
	Barium	1000	140	BH19-15
	Beryllium	4	<0.50	All Samples
	Boron	5000	600	BH19-18
	Cadmium	2.7	<0.10	All Samples
	Chromium	50	<5.0	All Samples
	Chromium VI	25	<0.50	All Samples
	Cobalt	3.8	4.3	BH19-15
	Copper	87	2.9	BH19-18
	Lead	10	<0.50	All Samples
	Mercury	1	<0.1	All Samples
	Molybdenum	70	7.1	BH19-12
	Nickel	100	6.4	BH19-17
	Sodium	490000	510000	BH19-18
	Selenium	10	<2.0	All Samples
	Silver	1.5	<0.10	All Samples
	Thallium	2	<0.050	All Samples
	Vanadium	6.2	0.63	BH19-15
	Zinc	1100	6.8	BH19-15
	Cyanide, Free	66	<1	All Samples
	Chloride (mg/L)	790	1200	BH19-18
	Uranium	20	3.7	BH19-15
PHCs	Benzene	5	-	All Samples
	Ethylbenzene	24	-	All Samples
	Toluene	2.4	-	All Samples
	Xylenes (Total)	300	-	All Samples
	F1 (C6 to C10) minus BTEX	750	<25	All Samples
	F2 (C10 to C16)	150	<100	All Samples
	F3 (C16 to C34)	500	<200	All Samples
	F4 (C34 to C50) minus PAHs	500	<200	All Samples
VOCs	Acetone	2700	18	BH19-17
	Benzene	5	<0.20	All Samples
	Bromodichloromethane	16	<0.50	All Samples
	Bromoform	25	<1.0	All Samples
	Bromomethane	0.89	<0.50	All Samples
	Carbon Tetrachloride	5	<0.20	All Samples
	Chlorobenzene	30	<0.20	All Samples
	Chloroform	22	<0.20	All Samples
	Dibromochloromethane	25	<0.50	All Samples
	1,2-Dichlorobenzene	3	<0.50	All Samples
	1,3-Dichlorobenzene	59	<0.50	All Samples
	1,4-Dichlorobenzene	1	<0.50	All Samples
	1,1-Dichloroethane	5	<0.20	All Samples
	1,2-Dichloroethane	5	<0.50	All Samples



Table 13: Summary of Maximum Concentrations in Groundwater

Parameter		Standard	Maximum Concentration	Location
VOCs	1,1-Dichloroethylene	14	<0.20	All Samples
	Cis-1,2-Dichloroethylene	17	<0.50	All Samples
	Trans-1,2-Dichloroethylene	17	<0.50	All Samples
	1,2-Dichloropropane	5	<0.20	All Samples
	Ethylbenzene	2.4	0.21	BH19-12
	Ethylene Dibromide	0.2	<0.20	All Samples
	Methyl Ethyl Ketone	1800	<10	All Samples
	Methylene Chloride	50	<2.0	All Samples
	Methyl Isobutyl Ketone	640	<5.0	All Samples
	Methyl-t-Butyl Ether	15	<0.50	All Samples
	Styrene	5.4	<0.50	All Samples
	1,1,1,2-Tetrachloroethane	1.1	<0.50	All Samples
	1,1,2,2-Tetrachloroethane	1	<0.50	All Samples
	Toluene	24	<0.20	All Samples
	Tetrachloroethylene	17	<0.20	All Samples
	1,1,1-Trichloroethane	200	<0.20	All Samples
	1,1,2-Trichloroethane	5	<0.50	All Samples
	Trichloroethylene	5	<0.20	All Samples
	Vinyl Chloride	1.7	<0.20	All Samples
	Total Xylenes	300	3.7	BH19-12
	Dichlorodifluoromethane	590	<1.0	All Samples
	Hexane(n)	520	<1.0	All Samples
	Trichlorofluoromethane	150	<0.50	All Samples
	1,3-Dichloropropene (cis + trans)	0.5	<0.50	All Samples

For Table Notes see **Notes for Soil and Groundwater Summary Tables**, included at the end of this Section.

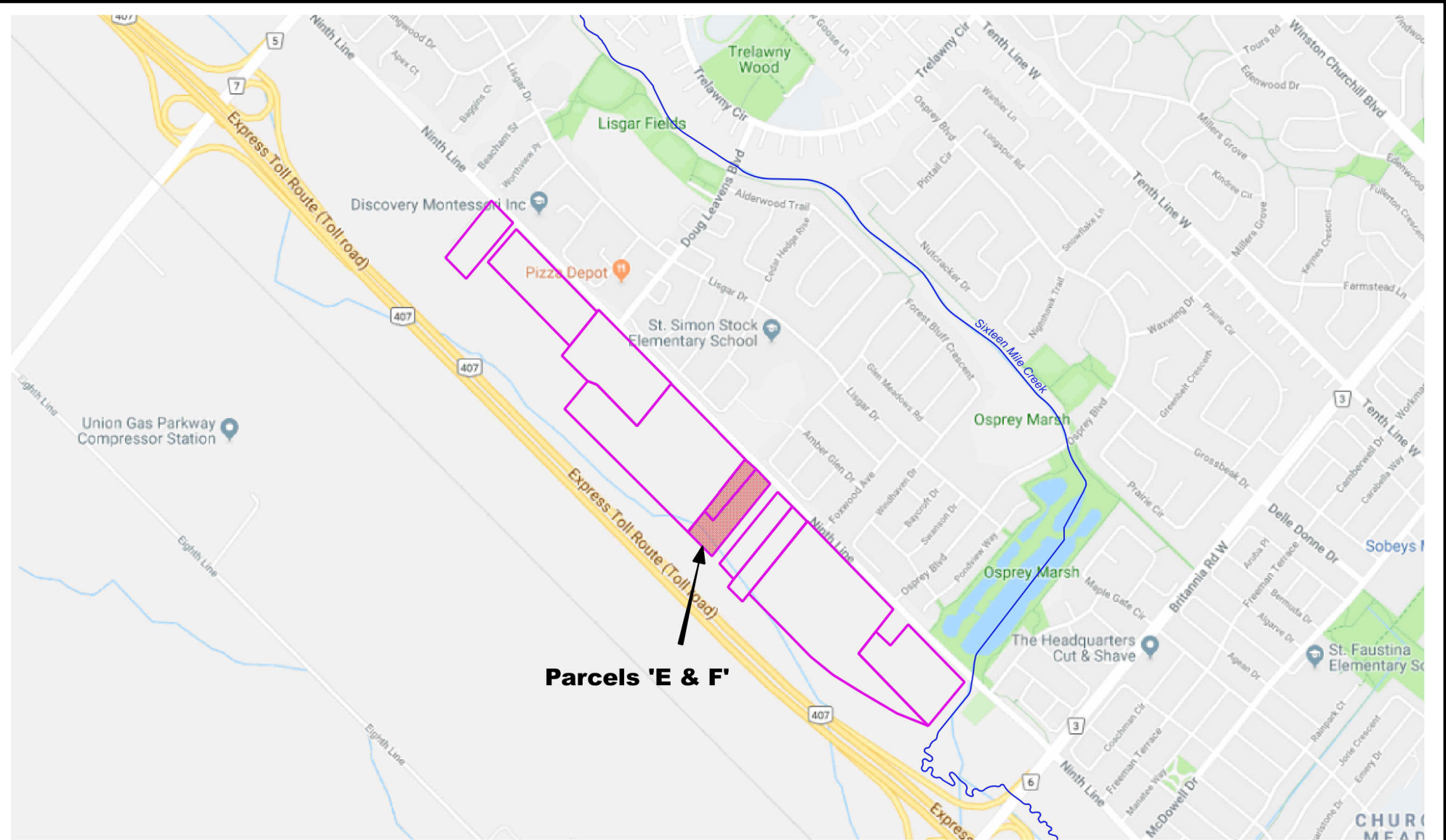


Notes for Soil and Groundwater Summary Tables



1.	mbgs =	Meters below ground surface
2.	masl =	Meters above sea level
3.		Units for all soil analyses are in µg/g (ppm) unless otherwise indicated
4.		Units for all groundwater analyses are in µg/L (ppb) unless otherwise indicated
5.	MECP Table 2	Full Depth Generic Site Condition Standards in a Potable Ground Water Condition. as contained in Table 2 of the Ontario Drinking Water Quality Guidelines
6.	CCME=	Canadian Environmental Quality Guidelines
7.		For soil and groundwater analytical results, concentration exceeds the applicable Standards
8.	NM =	Not Monitored
9.	PHC =	Petroleum Hydrocarbon
10.	PAH =	Polycyclic Aromatic Hydrocarbon
11.	BTEX =	Benzene, Toluene, Ethylbenzene, Xylene
12.	OCPs =	Organochlorine Pesticides

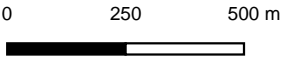


Figures



Legend

-  Site Boundary
-  Parcel 'E & F' Boundary



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Client:
MATTAMY DEVELOPMENT CORPORATION

Project: **PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
6302 and 6314 Ninth Line, Mississauga, ON**

Title: **SITE LOCATION PLAN**



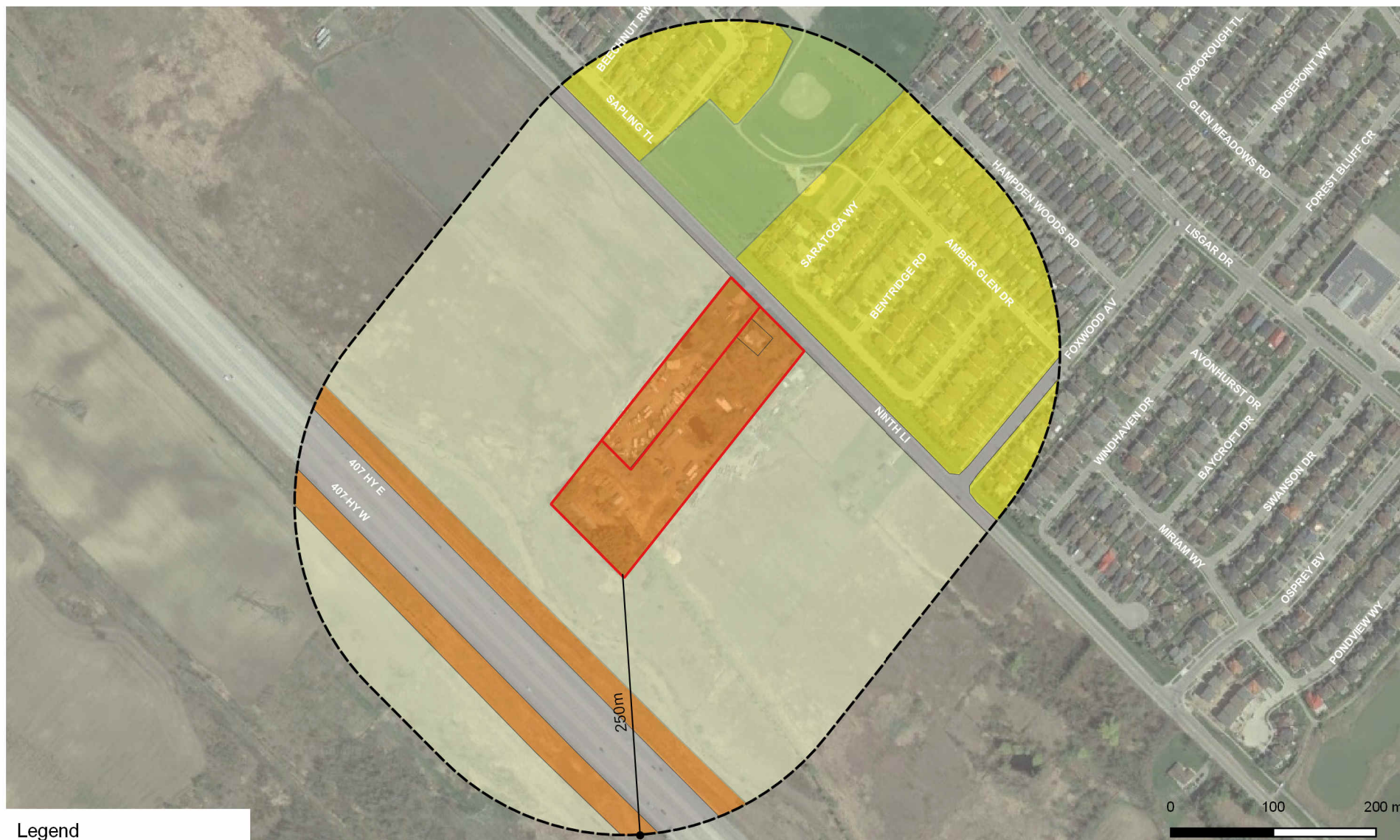
Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 1
Image/Map Source: Google Street Map			



Legend

Parcels 'E & F' Boundary

<div><div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</div></div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON			
	Title: PHASE TWO PROPERTY SITE PLAN			
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 2
	Image/Map Source: Image from City of Mississauga Interactive Map			



Legend

- Parcels 'E' & 'F' Boundary
- 250m Buffer
- Residential
- Commercial
- Agricultural
- Parkland



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Client:
DERRY BRITANNIA DEVELOPMENTS LTD.

Project: **PHASE TWO ENVIRONMENTAL SITE ASSESSMENT**
6302 and 6314 Ninth Line, Mississauga, ON

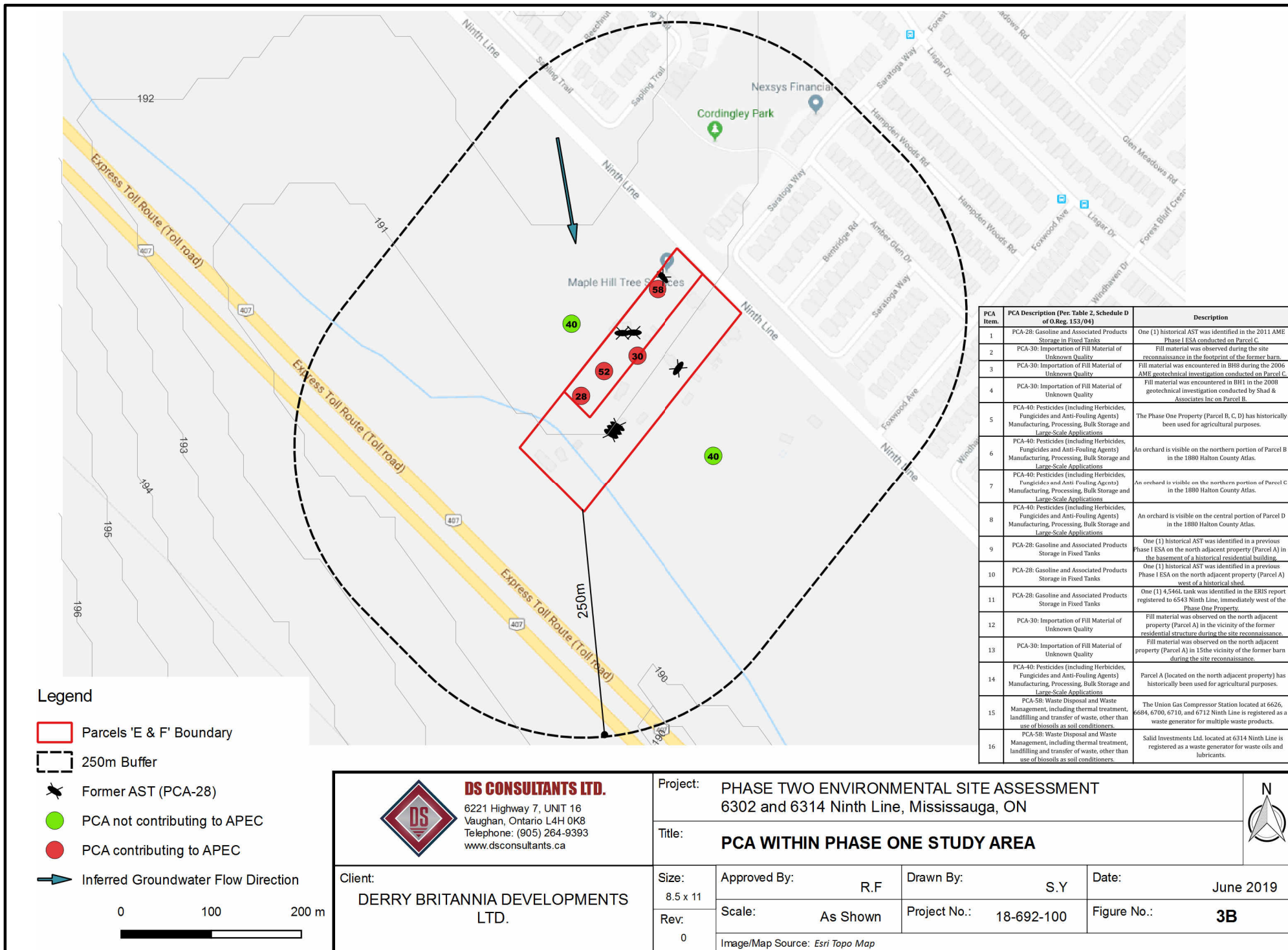
Title: **PHASE ONE STUDY AREA**

Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
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Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 3A
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Image/Map Source: Google Satellite Image







Legend

- Parcels 'E & F' Boundary
- Borehole (DS)
- ⊗ Monitoring Well (DS)
- ⊗ Borehole (Sirati & Partners Consultants Ltd.)
- ✖ Former AST (PCA-28)
- APEC - 1
- APEC - 2 & 3
- APEC - 4
- APEC - 5
- APEC - 6
- APEC - 7
- APEC - 8

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity
APEC-1	Entire Property	PCA-30: Importation of Fill Material of Unknown Quality -Historical Importation of fill material for grading purposes
APEC-2	Western portion of Parcel E	PCA-52: Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems -Parcel E was used for vehicle storage and maintenance.
APEC-3	Western portion of Parcel E	PCA-58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners - Parcel E was registered for waste oils and lubricants in the 1980s and 1990s.
APEC-4	Southwest corner of Parcel E	PCA-28: Gasoline and associated products storage in fixed tanks -a generator associated with a cell tower is located on the western side of Parcel E.
APEC-5	South-west central portion of Parcel F in the vicinity of Site Building E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of three (3) ASTs identified in the previous reports.
APEC-6	On the south-side of Site Building I on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of two (2) ASTs identified by the previous reports.
APEC-7	On the south-east exterior of Site Building B on Parcel F	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) AST identified by the previous reports.
APEC-8	On the south-east exterior of Site Building H on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks Historical use and presence of one (1) AST identified by the site interviews.



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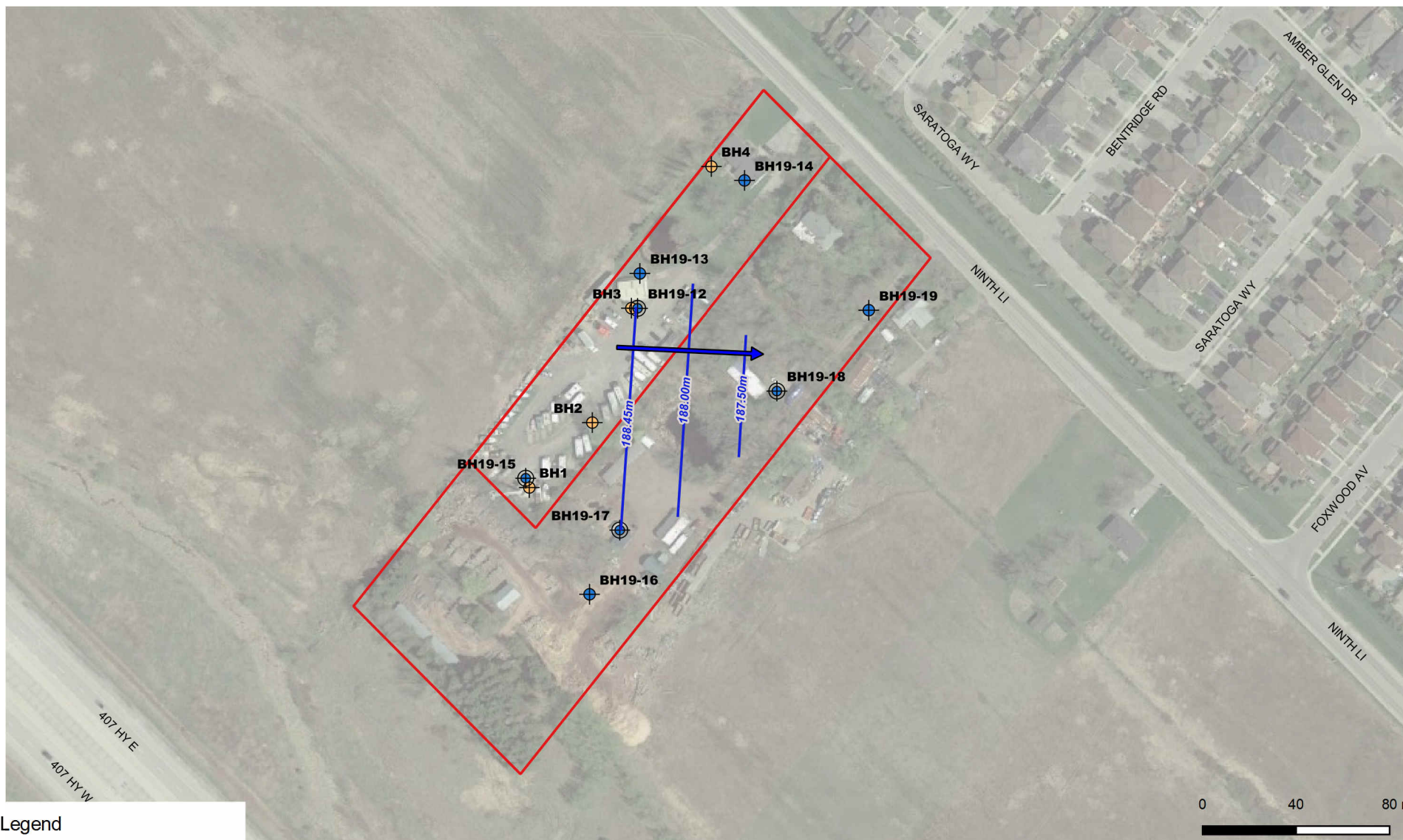
Client:
DERRY BRITANNIA DEVELOPMENTS LTD.

Project: **PHASE TWO ENVIRONMENTAL SITE ASSESSMENT**
6302 and 6314 Ninth Line, Mississauga, ON

Title: **BOREHOLE LOCATION PLAN WITH APECs**



Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 4
Image/Map Source: Google Satellite Image			





Legend

- Parcels 'E' & 'F' Boundary
- Borehole (DS)
- ⊕ Monitoring Well (DS)
- Borehole (Sirati & Partners Consultants Ltd.)
- Groundwater Contour Line
- ➔ Groundwater Flow

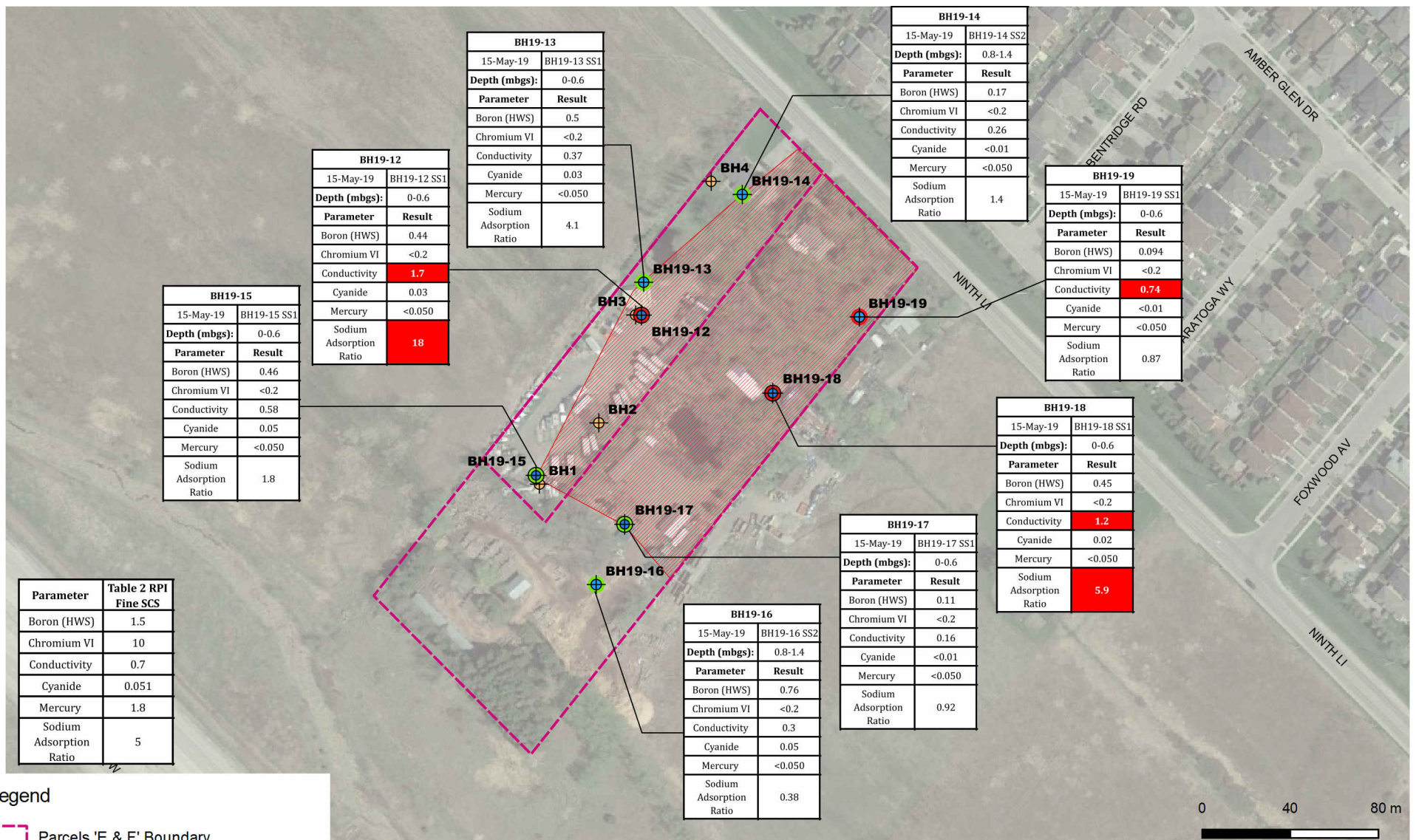
<div><div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K6 Telephone: (905) 264-9393 www.dsconsultants.ca</div></div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON				<div></div>
	Title: GROUNDWATER ELEVATION CONTOURS AND FLOW DIRECTION				
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019	
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 5	
	Image/Map Source: Google Satellite Image				



Legend



- Parcels 'E & F' Boundary
- ⊕ Borehole (DS)
- ⊕ Monitoring Well (DS)
- ⊕ Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards (0-0.6) Depth (mbgs)

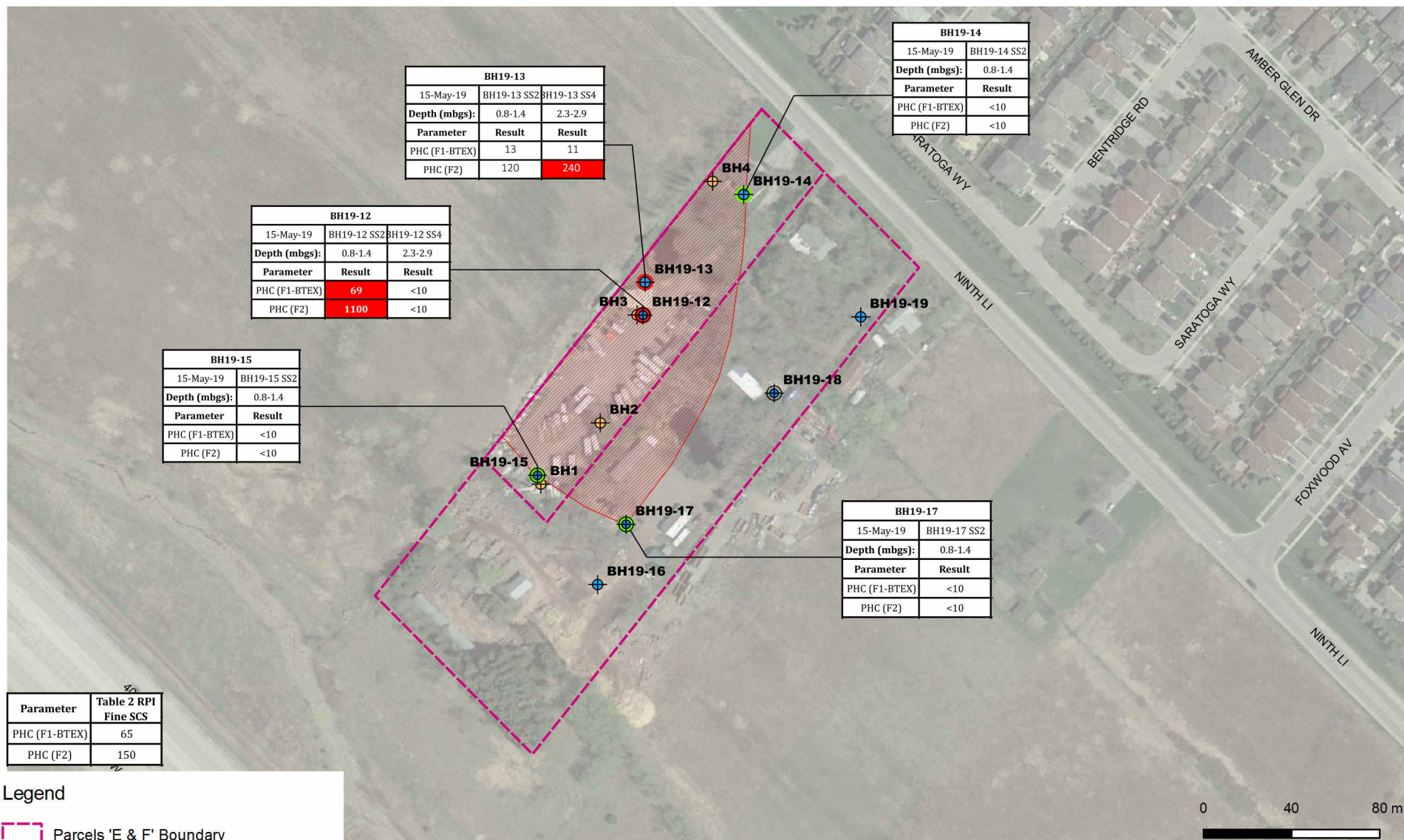
 <div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON				
	Title: SUMMARY OF METALS AND HYDRIDES IN SOIL				
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019	
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 6A	
		Image/Map Source: <i>Google Satellite Image</i>			



Legend



- Parcels 'E & F' Boundary
- + Borehole (DS)
- + Monitoring Well (DS)
- + Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards
- Sample Exceeds Applicable Standards
- Estimated Extent of ORP Impacts in Soil

 <div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON			
	Title: SUMMARY OF ORPs IN SOIL			
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 6B
	Image/Map Source: Google Satellite Image			



Legend

- Parcels 'E' & 'F' Boundary
- Borehole (DS)
- ⊕ Monitoring Well (DS)
- ⊕ Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards
- Sample Exceeds Applicable Standards
- Estimated Extent of PHC Impacts in Soil

 <div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON				
	Title: SUMMARY OF PHCs IN SOIL				
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019	
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 6C	
	Image/Map Source: Google Satellite Image				



Legend

- Parcels 'E & F' Boundary
- ⊕ Borehole (DS)
- ⊗ Monitoring Well (DS)
- ⊕ Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards



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Client:
DERRY BRITANNIA DEVELOPMENTS LTD.

Project: **PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
6302 and 6314 Ninth Line, Mississauga, ON**

Title: **SUMMARY OF VOCs IN SOIL**



Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 6D
Image/Map Source: Google Satellite Image			



Legend

- Parcels 'E & F' Boundary
- ⊕ Borehole (DS)
- ⊕ Monitoring Well (DS)
- ⊕ Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards



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Telephone: (905) 264-9393
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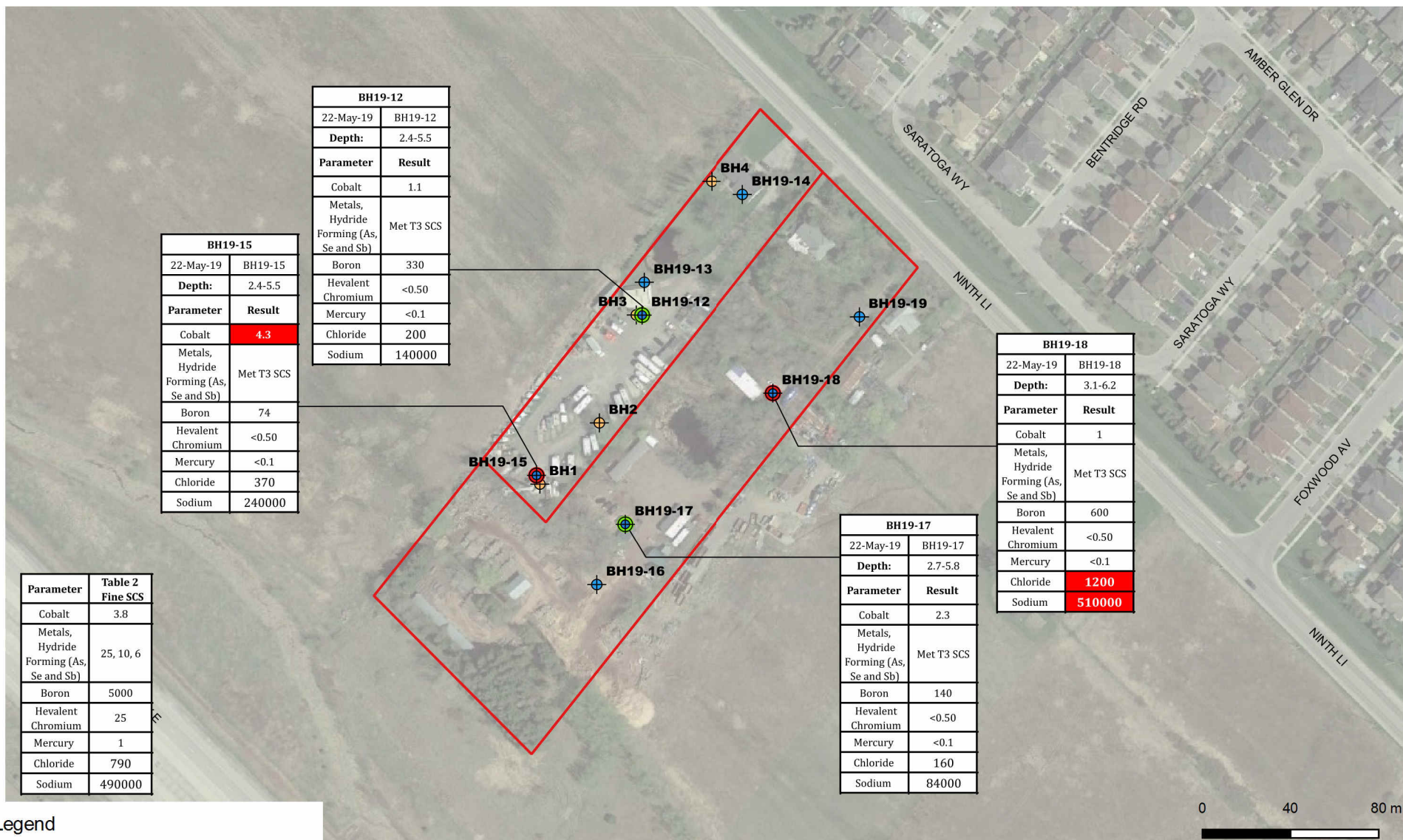
Client:
DERRY BRITANNIA DEVELOPMENTS LTD.

Project: **PHASE TWO ENVIRONMENTAL SITE ASSESSMENT**
6302 and 6314 Ninth Line, Mississauga, ON

Title: **SUMMARY OF PAHs IN SOIL**



Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 6E
Image/Map Source: Google Satellite Image			



BH19-15	
22-May-19	BH19-15
Depth:	2.4-5.5
Parameter	Result
Cobalt	4.3
Metals, Hydride Forming (As, Se and Sb)	Met T3 SCS
Boron	74
Hevalent Chromium	<0.50
Mercury	<0.1
Chloride	370
Sodium	240000

BH19-12	
22-May-19	BH19-12
Depth:	2.4-5.5
Parameter	Result
Cobalt	1.1
Metals, Hydride Forming (As, Se and Sb)	Met T3 SCS
Boron	330
Hevalent Chromium	<0.50
Mercury	<0.1
Chloride	200
Sodium	140000

BH19-18	
22-May-19	BH19-18
Depth:	3.1-6.2
Parameter	Result
Cobalt	1
Metals, Hydride Forming (As, Se and Sb)	Met T3 SCS
Boron	600
Hevalent Chromium	<0.50
Mercury	<0.1
Chloride	1200
Sodium	510000

BH19-17	
22-May-19	BH19-17
Depth:	2.7-5.8
Parameter	Result
Cobalt	2.3
Metals, Hydride Forming (As, Se and Sb)	Met T3 SCS
Boron	140
Hevalent Chromium	<0.50
Mercury	<0.1
Chloride	160
Sodium	84000

Parameter	Table 2 Fine SCS
Cobalt	3.8
Metals, Hydride Forming (As, Se and Sb)	25, 10, 6
Boron	5000
Hevalent Chromium	25
Mercury	1
Chloride	790
Sodium	490000

Legend

- Parcels 'E' & 'F' Boundary
- + Borehole (DS)
- ⊗ Monitoring Well (DS)
- + Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards
- Sample Exceeds Applicable Standards

 <div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON				
	Title: SUMMARY OF METALS AND ORPs IN GROUNDWATER				
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019	
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 7A	
	Image/Map Source: Google Satellite Image				



Legend

- Parcels 'E & F' Boundary
- ⊕ Borehole (DS)
- ⊗ Monitoring Well (DS)
- ⊕ Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards



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Client:
DERRY BRITANNIA DEVELOPMENTS LTD.

Project: **PHASE TWO ENVIRONMENTAL SITE ASSESSMENT**
6302 and 6314 Ninth Line, Mississauga, ON

Title: **SUMMARY OF PHCs IN GROUNDWATER**





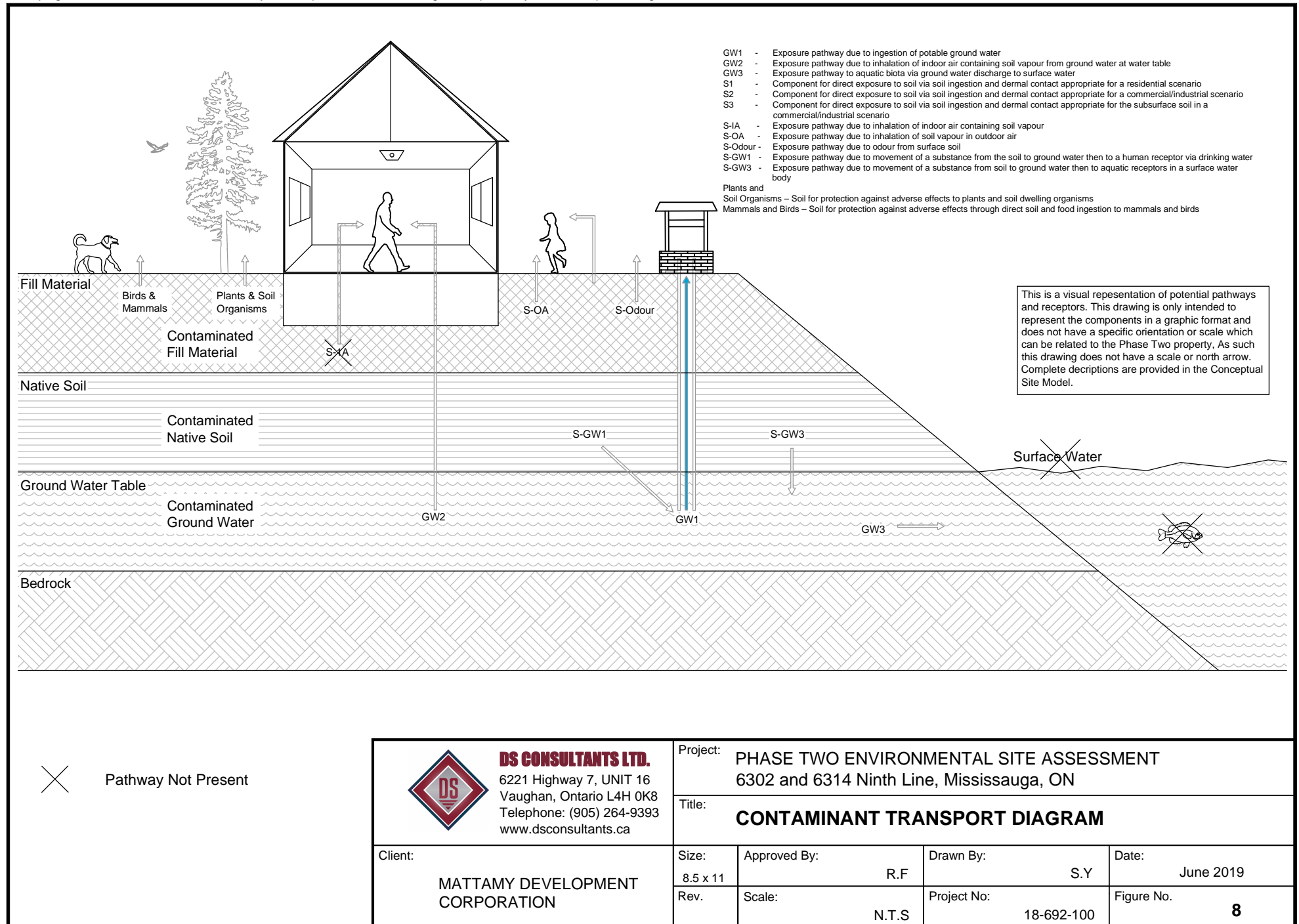
Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019
Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 7B
Image/Map Source: Google Satellite Image			



Legend

- Parcels 'E' & 'F' Boundary
- + Borehole (DS)
- ⊗ Monitoring Well (DS)
- + Borehole (Sirati & Partners Consultants Ltd.)
- Sample Met Applicable Standards

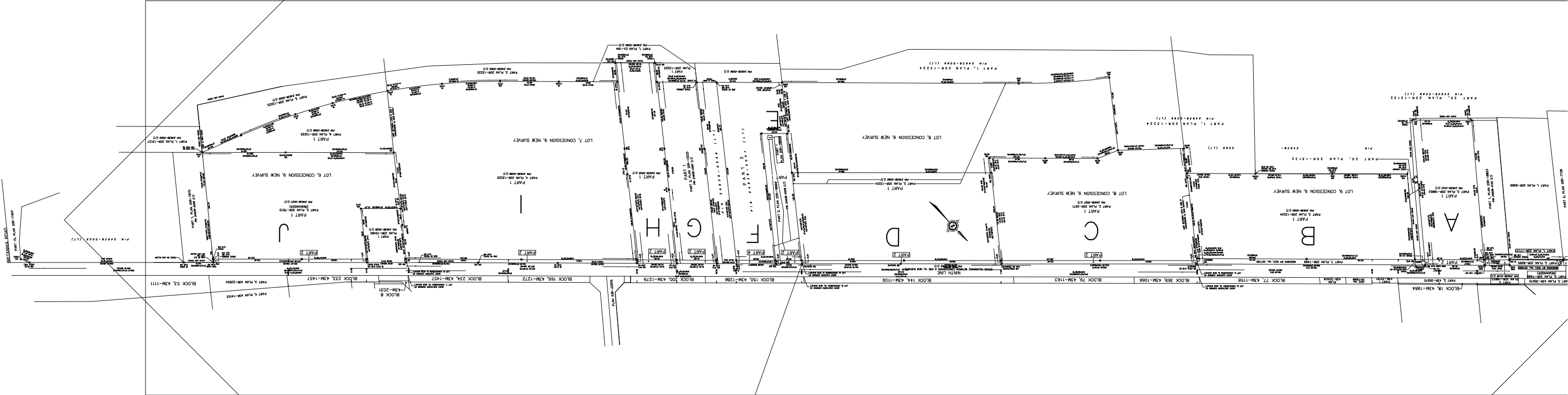
<div><div>DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca</div></div>	Project: PHASE TWO ENVIRONMENTAL SITE ASSESSMENT 6302 and 6314 Ninth Line, Mississauga, ON				<div></div>
	Title: SUMMARY OF VOCs IN GROUNDWATER				
Client: DERRY BRITANNIA DEVELOPMENTS LTD.	Size: 8.5 x 11	Approved By: R.F	Drawn By: S.Y	Date: June 2019	
	Rev: 0	Scale: As Shown	Project No.: 18-692-100	Figure No.: 7C	
	Image/Map Source: Google Satellite Image				





Appendix A

CONCESSION 9, NEW SURVEY, SF=1.0003051





Appendix B

Project Number: 18-692-100

2019-05-13

**Derry Britannia Developments Limited
7880 Keele Street
Vaughan, Ontario
L4K 4G7**

Attention: Mr. Eric Muller
Sent via email: eric.mueller@mattamycorp.com

**RE: Sampling and Analysis Plan
Phase Two Environmental Site Assessment
6302 and 6314 Ninth Line (Parcels E and F) Mississauga, Ontario**

1. Introduction

DS Consultants Limited (DS) is pleased to present the Sampling and Analysis Plan (SAP) for the proposed Phase Two Environmental Site Assessment of 6302 and 6314 Ninth Line (Parcels E and F) Mississauga, Ontario, (the Site). The purpose of the proposed Phase Two ESA program is to assess the current subsurface environmental conditions in support of the proposed redevelopment of the Site.

The Phase Two ESA will involve intrusive investigation in the areas determined in the Site visit to be Areas of Potential Environmental Concern (APECs), and will be completed in general accordance with O.Reg 153/04. Based on the findings of the field and laboratory analyses, a Phase Two ESA report will be prepared.

2. Background

Based on the Phase One Environmental Site Assessment completed by DS in May 2019, it is DS's understanding that the Site is a 2.28-hectare (6.98 acres) parcel of land which is currently used for Commercial purposes. The first developed use of the Site is interpreted to be Residential based on the findings of the Phase One ESA. A total of nine (9) potentially contaminating activities were identified on the Phase One Property or on neighbouring properties within the Phase One Study Area which are considered to be contributing to eight (8) Areas of Potential Environmental Concern (APECs) on the Phase Two Property. A summary of the APECs identified, the potential contaminants of concern, and the media potentially impacted is presented in Table 1 below:

Table 2-1: Areas of Potential Environmental Concern



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
APEC-1	Entire Property	PCA-30: Importation of Fill Material of Unknown Quality -Historical Importation of fill material for grading purposes	On Site	Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR, PAHs	Soil
APEC-2	Western portion of Parcel E	PCA-52: Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems -Parcel E was used for vehicle storage and maintenance.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-3	Western portion of Parcel E	PCA-58: Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners - Parcel E was registered for waste oils and lubricants in the 1980s and 1990s.	On-Site	PHCs (F1-F4), BTEX, PAHs	Soil
				PHCs (F1-F4), BTEX	Groundwater
APEC-4	Southwest corner of Parcel E	PCA-28: Gasoline and associated products storage in fixed tanks -a generator associated with a cell tower is located on the western side of Parcel E.	On Site	PHCs, PAHs	Soil
APEC-5	South-west central portion of Parcel F in the vicinity of Site Building E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of three (3) ASTs identified in the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr	Soil and ground water



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Ground water, soil and/or sediment)
				(VI), Hg, low or high pH, SAR	
APEC-6	On the south-side of Site Building I on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of two (2) ASTs identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-7	On the south-east exterior of Site Building B on Parcel F	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) AST identified by the previous reports.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water
APEC-8	Within the vicinity of Site Building H on Parcel E	PCA-28: Gasoline and Associated Products Storage in Fixed Tanks - Historical use and presence of one (1) fuel oil AST in the basement of Site Building H identified by the Site Interview.	On Site	PHC (F1-F4), VOCs Metals, As, Sb, Se, B-HWS, CN-, electrical conductivity, Cr (VI), Hg, low or high pH, SAR	Soil and ground water

Notes:

1. PHC (F1-F4) = Petroleum Hydrocarbons in the F1-F4 fraction ranges
2. VOCs = Volatile Organic Compounds
3. PAHs = Polycyclic Aromatic Hydrocarbons
4. PCBs = Polychlorinated Biphenyls

3. Site Investigation Program

The Site Investigation Program will be completed as follows:

- Public and private underground utilities and services will be cleared prior to commencement of intrusive investigation activities;
- A Health and Safety Plan will be prepared, and all work will be executed safely;
- Eight (8) boreholes will be advanced on the Phase Two Property, to an approximate maximum depth of 6.1 mbgs, or until sample refusal depth, or until groundwater is encountered, using a truck-mounted drill rig. The soil profile from each borehole will be

logged in the field and samples will be screened for total organic vapours (TOV) with a RKI Eagle 2 MultiGas Detector. The location of the boreholes will be selected to investigate any APECs identified during the Phase One ESA, as well as to delineate the horizontal and vertical extents of relevant parameters of concern.; Based on previous geotechnical reports summarized in the Phase One ESA and the MECP well records, it is not anticipated that bedrock will be encountered.

- Groundwater monitoring wells will be installed within four (4) of the eight (8) boreholes advanced in order to facilitate the collection of groundwater samples to assess the groundwater quality below the Site and to establish the direction of groundwater flow;
- Based on field screening and visual/olfactory observations, worst-case/representative soil samples from the boreholes will be submitted for laboratory testing of relevant parameters of concern;
- The groundwater levels in the wells will be measured at least 24 hours after well development has been completed, to determine the groundwater elevation. The wells will be surveyed to a geodetic benchmark to determine groundwater flow direction;
- The groundwater wells will be purged to remove stagnant water and sampled for laboratory testing of relevant parameters of concern;
- Both soil and groundwater samples will be submitted for chemical analysis by a CALA laboratory in accordance with the Ontario MECP standards and requirements of O.Reg. 153/04 under the Environmental Protection Act.

All field equipment is to be calibrated at the start of each field day, in accordance with DS's Standard Operating Procedures (SOPs). Clean, disposable Nitrile™ gloves will be used at each sampling interval to reduce the risk of cross contamination. All non-dedicated equipment (e.g. split spoon sampler, interface probe, etc.) will be decontaminated between each borehole. The equipment will be brushed free of debris, washed with phosphate-free detergent, and then rinsed with analyte free water.

The proposed monitoring wells will be installed using 50 mm inner diameter Schedule 40 polyvinyl chloride (PVC), equipped with 50 mm inner diameter Schedule 40 PVC with #10 slot well screens. A silica sand filter pack will be placed around the well screen and up to 0.61 metres above the top of the well screen. The well annulus will be sealed with hydrated bentonite. All wells will be protected with either a flush mount well casing, or a locked monument style casing.

The proposed analytical program is outlined below (proposed program subject to change as a result of site observations/findings). All soil and groundwater sampling will be carried out in accordance with DS's SOPs.



Soils:

- Eight (8) soil samples for analysis of Metals and other regulated parameters (ORPs)
- Eight (8) soil samples for analysis of Petroleum Hydrocarbons in the F1 to F4 fraction ranges (F1-F4), including benzene, toluene, ethylbenzene, and xylenes (collectively referred to as BTEX);
- Five (5) soil samples for analysis of Volatile Organic Compounds (VOCs);
- Five (5) soil samples for analysis of Polycyclic Aromatic Hydrocarbons (PAHs);

One quality control/quality assurance (QAQC) sample will be submitted for analysis per ten (10) samples analyzed in accordance with O.Reg. 153/04.

Groundwater:

- Four (4) groundwater samples for analysis of Metals and ORPs
- Four (4), groundwater samples for analysis of PHCs (F1 to F4 and BTEX);
- Four (4), groundwater samples for analysis of VOCs;

One quality control/quality assurance (QAQC) sample will be submitted for analysis per ten (10) samples analyzed in accordance with O.Reg. 153/04. One laboratory supplied trip blank will be submitted as part of each sample submission event for analysis of volatile parameters (i.e. VOCs, BTEX, PHCs F1-BTEX).

Following receipt of all of the results, a report in accordance with O.Reg. 153/04 will be prepared.

It is noted that if the Phase Two ESA reveals parameter concentrations greater than the applicable standards set out in *Ontario Regulation 153/04*, then additional work (i.e., supplemental delineation, additional drilling, sampling, analysis, and/or site remediation activities) will be deemed necessary prior to RSC filing, should an RSC be required. The costs for any additional work, if necessary, are beyond the current scope of work.

The SAP was created based on the request to complete a Phase Two ESA in support of the proposed redevelopment of the Site. The SAP was compiled to collect data to provide information on soil and/or groundwater quality in each APEC.

Additional delineation may be required following the implementation of this SAP to meet the requirements of O.Reg. 153/04 which requires delineation of all areas where concentrations are above the applicable SCS such as in the following conditions:



- Unexpected contamination not previously discovered, or not related to identified APECs, is discovered which will require further delineation to identify source(s); and
- If the sampling results indicate that the soil and/or groundwater impacts are deeper than initially expected.

We trust that this Sampling and Analysis Plan meets the objectives of the Client. If further assistance is required on this matter, please do not hesitate to contact the undersigned.

Yours Very Truly,

DS Consultants Ltd.

Patrick Fioravanti, B.Sc., P.Geo., QP_{ESA}
Manager – Environmental Services



Appendix C

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823919.7 E 599210.4

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019
REF. NO.: 18-692-100
ENCL NO.: 17

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kNm ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)				W _p	W	W _L			
190.9								20	40	60	80	100					GR SA SI CL
0.0	FILL: asphalt, silty sand with gravel, grey, very moist, loose		1	SS	6												80 ppm HEX, 3 ppm IBL
190.1							190										
0.8	FILL: clayey silt, trace topsoil, trace sand, grey, very moist, loose		2	SS	8		W. L. 190.0 m May 17, 2019										940 ppm HEX, 15 ppm IBL
189.4																	
1.5	CLAYEY SILT: trace sand, greyish brown, moist, stiff (weathered/disturbed)		3	SS	8		189										85 ppm HEX, 5 ppm IBL
188.6																	
2.3	CLAYEY SILT TILL: sandy, trace gravel, greyish brown to grey, moist, very stiff to hard		4	SS	23		188										25 ppm HEX, 2 ppm IBL
	grey below 3.1m																
			5	SS	35		187										50 ppm HEX, 0 ppm IBL
			6	SS	16		186										45 ppm HEX, 0 ppm IBL
							185										
184.6			7	SS	56												30 ppm HEX, 0 ppm IBL
6.3	END OF BOREHOLE: Notes: 1) 50 mm dia. monitoring well installed upon completion Date Water Level(m) May 17, 2019 0.9 mbgl																

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, X 3: Numbers refer to Sensitivity

○ = 3% Strain at Failure

DS SOIL LOG /DRAFT 18-692-100, 9TH LINE MATTAMY - FINAL ENVIRONMENTAL GPJ DS.GDT 19-6-17

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823934.6 E 599211.1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019
REF. NO.: 18-692-100
ENCL NO.: 18

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m													
SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE																		
190.7								20	40	60	80	100						GR SA SI CL
190.6	TOPSOIL: 100mm		1	SS	6		190											25 ppm HEX, 0 ppm IBL
0.1	FILL: clayey silt, trace sand, greyish brown, moist, loose		2	SS	6													105 ppm HEX, 1 ppm IBL
189.2			3	SS	14		189											45 ppm HEX, 1 ppm IBL
1.5	CLAYEY SILT TILL: sandy, trace gravel, greyish brown, moist, stiff to hard		4	SS	20		188											55 ppm HEX, 0 ppm IBL
			5	SS	32		187											30 ppm HEX, 0 ppm IBL
	occasional sand seams, grey below 3.1m		6	SS	21		186											30 ppm HEX, 0 ppm IBL
185.5																		
5.2	END OF BOREHOLE: Notes: 1) Borehole open and dry upon completion																	

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ s=3% Strain at Failure

DS SOIL LOG /DRAFT 18-692-100, 9TH LINE MATTAMY - FINAL ENVIRONMENTAL GRU DS GDT 19-6-17

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823969.7 E 599261.8

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019
REF. NO.: 18-692-100
ENCL NO.: 19

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)		
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)										WATER CONTENT (%)	
								○ UNCONFINED	● QUICK TRIAXIAL	+	×							FIELD VANE & Sensitivity LAB VANE	
191.3								20	40	60	80	100						GR SA SI CL	
0.0 191.1																			
0.2	TOPSOIL: 200mm		1	SS	2		191											35 ppm HEX, 0 ppm IBL	
	FILL: clayey silt, trace rootlets, trace organics, brown, moist, very loose to loose																		
			2	SS	7													50 ppm HEX, 0 ppm IBL	
189.8							190												
1.5	CLAYEY SILT: trace sand, greyish brown, moist, firm (weathered/disturbed)		3	SS	7													35 ppm HEX, 0 ppm IBL	
189.0							189												
2.3	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble/boulder, grey, moist, very stiff to hard		4	SS	20													30 ppm HEX, 0 ppm IBL	
			5	SS	20		188											50 ppm HEX, 0 ppm IBL	
							187												
186.5			6	SS	50/ 125mm													45 ppm HEX, 0 ppm IBL	
4.8	END OF BOREHOLE: Notes: 1) Borehole dry and open upon completion																		

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+³, ×³: Numbers refer to Sensitivity

○ s=3% Strain at Failure

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823846.4 E 599163.6

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019
REF. NO.: 18-692-100
ENCL NO.: 20

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kNm ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m)	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)				W _p	W	W _L			
191.1								20	40	60	80	100					
0.0	FILL: sandy silt mixed with topsoil, sand & gravel, dark grey, moist, loose		1	SS	7		191										55 ppm HEX, 0 ppm IBL
190.3																	
0.8	FILL: clayey silt, brown, very moist, loose (possibly weathered/disturbed native)		2	SS	5		190										35 ppm HEX, 0 ppm IBL
189.6																	
1.5	FILL: clayey silt, trace sand, brown, moist, firm (Possibly weathered/disturbed native)		3	SS	5		189										25 ppm HEX, 0 ppm IBL
188.8																	
2.3	CLAYEY SILT TILL: sandy, trace gravel, occasional sand seams, occasional cobble/boulder, grey, moist, very stiff to hard		4	SS	22		188										40 ppm HEX, 0 ppm IBL
			5	SS	22		187										35 ppm HEX, 0 ppm IBL
			6	SS	34		186										40 ppm HEX, 0 ppm IBL
			7	SS	47		185										60 ppm HEX, 0 ppm IBL
184.4																	
6.7	END OF BOREHOLE: Notes: 1) 50 mm dia. monitoring well installed upon completion Date Water Level(m) May 17, 2019 0.41 mbgl																

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES



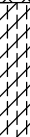
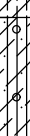
+ 3, × 3: Numbers refer to Sensitivity

○ s=3% Strain at Failure

DS SOIL LOG /DRAFT 18-692-100, 9TH LINE MATTAMY - FINAL ENVIRONMENTAL GPJ DS.GDT 19-6-17

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823789.2 E 599191.4

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019
REF. NO.: 18-692-100
ENCL NO.: 21

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)									
191.2								20	40	60	80	100					GR SA SI CL
0.0	FILL: woodchips, loose		1	SS	8		191										110 ppm HEX, 0 ppm IBL
190.4																	
0.8	FILL: clayey silt, trace to some organics, dark grey, very moist, loose		2	SS	8		190										280 ppm HEX, 0 ppm IBL
			3	SS	6												
	Possibly weathered/disturbed native 2.3m						189										
188.6			4	SS	7												70 ppm HEX, 0 ppm IBL
2.6	SILTY CLAY: trace sand, brown, moist to wet, firm to very stiff																
			5	SS	16		188										60 ppm HEX, 0 ppm IBL
187.2							187										
4.0	CLAYEY SILT TILL: sandy, trace gravel, grey, moist, hard																
			6	SS	31												70 ppm HEX, 0 ppm IBL
							186										
							185										85 ppm HEX, 0 ppm IBL
			7	SS	30												
184.5																	
6.7	END OF BOREHOLE: Notes: 1) Borehole dry upon completion.																

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+³, ×³: Numbers refer to Sensitivity

○ s=3% Strain at Failure

DS SOIL LOG /DRAFT 18-692-100, 9TH LINE MATTAMY - FINAL ENVIRONMENTAL GPJ DS.GDT 19-6-17

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823824.9 E 599204.1





DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019

REF. NO.: 18-692-100
ENCL NO.: 22

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT W _P	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	POCKET PEN (C _u) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)			
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m		SHEAR STRENGTH (kPa)										WATER CONTENT (%)		
							20	40	60	80							100	20	40
191.0	0.0	FILL: woodchips, dark brown, very loose	1	SS	2	W. L. 190.5 m May 17, 2019										0 ppm HEX, 0 ppm IBL			
190.2																			
189.2	0.8	FILL: clayey silt, trace topsoil/organics, brown and grey, very moist to wet, very loose to loose	2	SS	3														
189.2																			
188.7	1.8	CLAYEY SILT: trace sand, brown, moist, firm	3	SS	8														
188.7																			
188.7	2.3	CLAYEY SILT TILL: sandy, trace gravel, brown, moist, stiff to hard	4	SS	14														
188.7																			
188.7	3	grey below 3.1m	5	SS	24														
188.7																			
188.7	4	occasional cobble/boulder below 4.6 m	6	SS	25														
188.7																			
188.7	6		7	SS	79														
188.7																			
184.5	6.5	END OF BOREHOLE: Notes: 1) 50 mm dia. monitoring well installed upon completion Date Water Level(m) May 17, 2019 0.6 mbgl																	

DS SOIL LOG /DRAFT 18-692-100. 9TH LINE MATTAMY - FINAL ENVIRONMENTAL.GPJ DS.GDT 19-6-17

GROUNDWATER ELEVATIONS

	1st	2nd	3rd	4th
Measurement				

GRAPH
NOTES

$+^3, \times^3$: Numbers refer to Sensitivity

○ $\epsilon = 3\%$ Strain at Failure

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823885 E 599270.6

DRILLING DATA

Method: Solid Stem Auger	
Diameter: 150mm	REF. NO.: 18-692-100
Date: May-14-2019	ENCL NO.: 23

[illegible]

DS SOIL LOG /DRAFT 18-692-100, 9TH LINE MATTAMY - FINAL ENVIRONMENTAL.GPJ DS.GDT 19-6-17

GROUNDWATER ELEVATIONS

	1st	2nd	3rd	4th
Measurement				





GRAPH
NOTES

$+^3, \times^3$: Numbers refer to Sensitivity

○ **ε**=3% Strain at Failure

PROJECT: Phase Two ESA
CLIENT: Derry Britannia Developments Ltd.
PROJECT LOCATION: Ninth Line, Mississauga, ON
DATUM: Geodetic
BH LOCATION: See Figure 4 N 4823920.3 E 599309.4

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150mm
Date: May-14-2019
REF. NO.: 18-692-100
ENCL NO.: 24

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m			SHEAR STRENGTH (kPa)							
191.1								20 40 60 80 100	20 40 60 80 100	10 20 30			GR SA SI CL		
0.0	FILL: clayey silt, trace topsoil/ rootlets, brown, compact		1	SS	10		191							0 ppm HEX, 0 ppm IBL	
			2	SS	10		190								0 ppm HEX, 0 ppm IBL
189.6	CLAYEY SILT TILL: sandy, trace gravel, occasional cobble, greyish brown, moist, stiff to very stiff		3	SS	10		189							0 ppm HEX, 0 ppm IBL	
1.5			4	SS	21									0 ppm HEX, 0 ppm IBL	
			5	SS	22		188							0 ppm HEX, 0 ppm IBL	
							187							0 ppm HEX, 0 ppm IBL	
	grey below 4.6m		6	SS	13	186								0 ppm HEX, 0 ppm IBL	
185.6	SAND: trace gravel, grey, wet, compact					185							0 ppm HEX, 10 ppm IBL		
5.5			7	SS	21										
184.6	CLAYEY SILT TILL: sandy, trace gravel, grey, moist, very stiff		8	SS	21										
6.5	END OF BOREHOLE: Notes: 1) Water level at 6.1 m during drilling														
184.4															
6.7															

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ s=3% Strain at Failure

DS SOIL LOG /DRAFT 18-692-100, 9TH LINE MATTAMY - FINAL ENVIRONMENTAL GPJ DS.GDT 19-6-17



Appendix D

Your Project #: 18-692-100
Site Location: FORCE 1 EF
Your C.O.C. #: na

Attention: Tanner Leonhardt

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2019/05/28
Report #: R5728216
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D4572

Received: 2019/05/21, 11:30

Sample Matrix: Soil
Samples Received: 16

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	5	N/A	2019/05/27	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	8	2019/05/23	2019/05/23	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	5	N/A	2019/05/24		EPA 8260C m
Free (WAD) Cyanide	8	2019/05/23	2019/05/27	CAM SOP-00457	OMOE E3015 m
Conductivity	8	2019/05/23	2019/05/23	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	8	2019/05/23	2019/05/23	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (2)	2	N/A	2019/05/24	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (3)	7	2019/05/23	2019/05/23	CAM SOP-00316	CCME CWS m
Petroleum Hydrocarbons F2-F4 in Soil (3)	1	2019/05/23	2019/05/24	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS	8	2019/05/23	2019/05/23	CAM SOP-00447	EPA 6020B m
Moisture	16	N/A	2019/05/16	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	1	2019/05/23	2019/05/25	CAM SOP-00318	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM)	4	2019/05/24	2019/05/24	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	8	2019/05/23	2019/05/23	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	8	N/A	2019/05/24	CAM SOP-00102	EPA 6010C
Volatile Organic Compounds and F1 PHCs	5	N/A	2019/05/23	CAM SOP-00230	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025 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

Your Project #: 18-692-100
Site Location: FORCE 1 EF
Your C.O.C. #: na

Attention: Tanner Leonhardt

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2019/05/28
Report #: R5728216
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D4572

Received: 2019/05/21, 11:30

dilution methods.

Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) Soils are reported on a dry weight basis unless otherwise specified.

(2) No lab extraction date is given for F1BTX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.

(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

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

Ashton Gibson, Project Manager

Email: AGibson@maxxam.ca

Phone# (905)817-5765

=====

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.

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		JTM680			JTM683	JTM686		
Sampling Date		2019/05/15			2019/05/15	2019/05/15		
COC Number		na			na	na		
	UNITS	BH19-12 SS1	RDL	QC Batch	BH19-13 SS1	BH19-14 SS2	RDL	QC Batch
Calculated Parameters								
Sodium Adsorption Ratio	N/A	18		6133187	4.1	1.4		6133187
Inorganics								
Conductivity	mS/cm	1.7	0.002	6136249	0.37	0.26	0.002	6136249
Moisture	%	14	1.0	6135753				
Available (CaCl ₂) pH	pH	7.48		6135911	7.39	7.31		6135911
WAD Cyanide (Free)	ug/g	0.03	0.01	6136048	0.03	<0.01	0.01	6136048
Chromium (VI)	ug/g	<0.2	0.2	6135946	<0.2	<0.2	0.2	6135946
Metals								
Hot Water Ext. Boron (B)	ug/g	0.44	0.050	6136038	0.50	0.17	0.050	6136038
Acid Extractable Antimony (Sb)	ug/g	0.29	0.20	6136002	0.22	<0.20	0.20	6136002
Acid Extractable Arsenic (As)	ug/g	5.4	1.0	6136002	5.3	6.3	1.0	6136002
Acid Extractable Barium (Ba)	ug/g	46	0.50	6136002	100	130	0.50	6136002
Acid Extractable Beryllium (Be)	ug/g	0.50	0.20	6136002	0.92	1.1	0.20	6136002
Acid Extractable Boron (B)	ug/g	8.1	5.0	6136002	8.5	11	5.0	6136002
Acid Extractable Cadmium (Cd)	ug/g	0.34	0.10	6136002	0.23	0.17	0.10	6136002
Acid Extractable Chromium (Cr)	ug/g	20	1.0	6136002	25	32	1.0	6136002
Acid Extractable Cobalt (Co)	ug/g	8.6	0.10	6136002	13	17	0.10	6136002
Acid Extractable Copper (Cu)	ug/g	34	0.50	6136002	23	29	0.50	6136002
Acid Extractable Lead (Pb)	ug/g	30	1.0	6136002	22	15	1.0	6136002
Acid Extractable Molybdenum (Mo)	ug/g	0.73	0.50	6136002	0.58	<0.50	0.50	6136002
Acid Extractable Nickel (Ni)	ug/g	19	0.50	6136002	24	36	0.50	6136002
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	6136002	<0.50	<0.50	0.50	6136002
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	6136002	<0.20	<0.20	0.20	6136002
Acid Extractable Thallium (Tl)	ug/g	0.11	0.050	6136002	0.15	0.20	0.050	6136002
Acid Extractable Uranium (U)	ug/g	0.53	0.050	6136002	1.1	0.70	0.050	6136002
Acid Extractable Vanadium (V)	ug/g	24	5.0	6136002	38	46	5.0	6136002
Acid Extractable Zinc (Zn)	ug/g	120	5.0	6136002	93	74	5.0	6136002
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	6136002	<0.050	<0.050	0.050	6136002
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		JTM686			JTM687			JTM687		
Sampling Date		2019/05/15			2019/05/15			2019/05/15		
COC Number		na			na			na		
	UNITS	BH19-14 SS2 Lab-Dup	RDL	QC Batch	BH19-15 SS1	RDL	QC Batch	BH19-15 SS1 Lab-Dup	RDL	QC Batch

Calculated Parameters										
Sodium Adsorption Ratio	N/A				1.8		6133187			

Inorganics										
Conductivity	mS/cm				0.58	0.002	6136249	0.56	0.002	6136249
Moisture	%				15	1.0	6135753			
Available (CaCl ₂) pH	pH				7.33		6135911			
WAD Cyanide (Free)	ug/g				0.05	0.01	6136048			
Chromium (VI)	ug/g				<0.2	0.2	6135946			

Metals										
Hot Water Ext. Boron (B)	ug/g				0.46	0.050	6136038			
Acid Extractable Antimony (Sb)	ug/g	0.21	0.20	6136002	0.27	0.20	6136002			
Acid Extractable Arsenic (As)	ug/g	6.5	1.0	6136002	3.8	1.0	6136002			
Acid Extractable Barium (Ba)	ug/g	130	0.50	6136002	61	0.50	6136002			
Acid Extractable Beryllium (Be)	ug/g	1.1	0.20	6136002	0.54	0.20	6136002			
Acid Extractable Boron (B)	ug/g	12	5.0	6136002	7.2	5.0	6136002			
Acid Extractable Cadmium (Cd)	ug/g	0.14	0.10	6136002	0.27	0.10	6136002			
Acid Extractable Chromium (Cr)	ug/g	33	1.0	6136002	18	1.0	6136002			
Acid Extractable Cobalt (Co)	ug/g	17	0.10	6136002	7.8	0.10	6136002			
Acid Extractable Copper (Cu)	ug/g	28	0.50	6136002	22	0.50	6136002			
Acid Extractable Lead (Pb)	ug/g	15	1.0	6136002	25	1.0	6136002			
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	6136002	<0.50	0.50	6136002			
Acid Extractable Nickel (Ni)	ug/g	36	0.50	6136002	16	0.50	6136002			
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	6136002	<0.50	0.50	6136002			
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	6136002	<0.20	0.20	6136002			
Acid Extractable Thallium (Tl)	ug/g	0.20	0.050	6136002	0.11	0.050	6136002			
Acid Extractable Uranium (U)	ug/g	0.71	0.050	6136002	0.66	0.050	6136002			
Acid Extractable Vanadium (V)	ug/g	48	5.0	6136002	26	5.0	6136002			
Acid Extractable Zinc (Zn)	ug/g	73	5.0	6136002	68	5.0	6136002			
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	6136002	<0.050	0.050	6136002			

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

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		JTM689			JTM690			JTM690		
Sampling Date		2019/05/15			2019/05/15			2019/05/15		
COC Number		na			na			na		
	UNITS	BH19-16 SS2	RDL	QC Batch	BH19-17 SS1	RDL	QC Batch	BH19-17 SS1 Lab-Dup	RDL	QC Batch

Calculated Parameters

Sodium Adsorption Ratio	N/A	0.38		6133187	0.92		6133187			
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Inorganics

Conductivity	mS/cm	0.30	0.002	6136249	0.16	0.002	6136249			
Moisture	%				21	1.0	6135753	20	1.0	6135753
Available (CaCl2) pH	pH	7.03		6135911	7.68		6135911			
WAD Cyanide (Free)	ug/g	0.05	0.01	6136048	<0.01	0.01	6136048			
Chromium (VI)	ug/g	<0.2	0.2	6135946	<0.2	0.2	6135946			

Metals

Hot Water Ext. Boron (B)	ug/g	0.76	0.050	6136038	0.11	0.050	6136038			
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	6136002	<0.20	0.20	6136002			
Acid Extractable Arsenic (As)	ug/g	4.2	1.0	6136002	3.6	1.0	6136002			
Acid Extractable Barium (Ba)	ug/g	110	0.50	6136002	86	0.50	6136002			
Acid Extractable Beryllium (Be)	ug/g	0.91	0.20	6136002	0.58	0.20	6136002			
Acid Extractable Boron (B)	ug/g	7.5	5.0	6136002	7.3	5.0	6136002			
Acid Extractable Cadmium (Cd)	ug/g	0.23	0.10	6136002	<0.10	0.10	6136002			
Acid Extractable Chromium (Cr)	ug/g	25	1.0	6136002	20	1.0	6136002			
Acid Extractable Cobalt (Co)	ug/g	11	0.10	6136002	11	0.10	6136002			
Acid Extractable Copper (Cu)	ug/g	20	0.50	6136002	21	0.50	6136002			
Acid Extractable Lead (Pb)	ug/g	15	1.0	6136002	8.3	1.0	6136002			
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	6136002	<0.50	0.50	6136002			
Acid Extractable Nickel (Ni)	ug/g	23	0.50	6136002	20	0.50	6136002			
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	6136002	<0.50	0.50	6136002			
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	6136002	<0.20	0.20	6136002			
Acid Extractable Thallium (Tl)	ug/g	0.14	0.050	6136002	0.12	0.050	6136002			
Acid Extractable Uranium (U)	ug/g	1.5	0.050	6136002	0.54	0.050	6136002			
Acid Extractable Vanadium (V)	ug/g	38	5.0	6136002	28	5.0	6136002			
Acid Extractable Zinc (Zn)	ug/g	77	5.0	6136002	45	5.0	6136002			
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	6136002	<0.050	0.050	6136002			

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

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		JTM692			JTM693		
Sampling Date		2019/05/15			2019/05/15		
COC Number		na			na		
	UNITS	BH19-18 SS1	RDL	QC Batch	BH19-19 SS2	RDL	QC Batch
Calculated Parameters							
Sodium Adsorption Ratio	N/A	5.9		6133187	0.87		6133187
Inorganics							
Conductivity	mS/cm	1.2	0.002	6136249	0.74	0.002	6136249
Moisture	%				18	1.0	6135753
Available (CaCl ₂) pH	pH	7.41		6135911	7.65		6135911
WAD Cyanide (Free)	ug/g	0.02	0.01	6136048	<0.01	0.01	6136048
Chromium (VI)	ug/g	<0.2	0.2	6135946	<0.2	0.2	6135946
Metals							
Hot Water Ext. Boron (B)	ug/g	0.45	0.050	6136038	0.094	0.050	6136038
Acid Extractable Antimony (Sb)	ug/g	0.21	0.20	6136002	<0.20	0.20	6136002
Acid Extractable Arsenic (As)	ug/g	5.0	1.0	6136002	3.9	1.0	6136002
Acid Extractable Barium (Ba)	ug/g	98	0.50	6136002	90	0.50	6136002
Acid Extractable Beryllium (Be)	ug/g	0.80	0.20	6136002	0.87	0.20	6136002
Acid Extractable Boron (B)	ug/g	9.4	5.0	6136002	9.0	5.0	6136002
Acid Extractable Cadmium (Cd)	ug/g	0.23	0.10	6136002	0.11	0.10	6136002
Acid Extractable Chromium (Cr)	ug/g	24	1.0	6136002	23	1.0	6136002
Acid Extractable Cobalt (Co)	ug/g	11	0.10	6136002	12	0.10	6136002
Acid Extractable Copper (Cu)	ug/g	27	0.50	6136002	28	0.50	6136002
Acid Extractable Lead (Pb)	ug/g	22	1.0	6136002	12	1.0	6136002
Acid Extractable Molybdenum (Mo)	ug/g	0.60	0.50	6136002	<0.50	0.50	6136002
Acid Extractable Nickel (Ni)	ug/g	24	0.50	6136002	28	0.50	6136002
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	6136002	<0.50	0.50	6136002
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	6136002	<0.20	0.20	6136002
Acid Extractable Thallium (Tl)	ug/g	0.15	0.050	6136002	0.17	0.050	6136002
Acid Extractable Uranium (U)	ug/g	0.65	0.050	6136002	0.67	0.050	6136002
Acid Extractable Vanadium (V)	ug/g	35	5.0	6136002	34	5.0	6136002
Acid Extractable Zinc (Zn)	ug/g	78	5.0	6136002	62	5.0	6136002
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	6136002	<0.050	0.050	6136002
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							

O.REG 153 PAHS (SOIL)

Maxxam ID		JTM681			JTM683		JTM689		JTM692		
Sampling Date		2019/05/15			2019/05/15		2019/05/15		2019/05/15		
COC Number		na			na		na		na		
	UNITS	BH19-12 SS2	RDL	QC Batch	BH19-13 SS1	RDL	BH19-16 SS2	RDL	BH19-18 SS1	RDL	QC Batch
Inorganics											
Moisture	%				26	1.0	19	1.0	16	1.0	6135753
Calculated Parameters											
Methylnaphthalene, 2-(1-)	ug/g	3.4	0.0071	6133256	<0.071	0.071	<0.0071	0.0071	<0.0071	0.0071	6133256
Polyaromatic Hydrocarbons											
Acenaphthene	ug/g	0.32	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	6138362
Acenaphthylene	ug/g	0.050	0.0050	6137815	<0.010 (1)	0.010	<0.0050	0.0050	<0.0050	0.0050	6138362
Anthracene	ug/g	0.10	0.0050	6137815	<0.050	0.050	<0.0050	0.0050	<0.0050	0.0050	6138362
Benzo(a)anthracene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	<0.010 (1)	0.010	6138362
Benzo(a)pyrene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	0.0053	0.0050	6138362
Benzo(b,j)fluoranthene	ug/g	<0.0050	0.0050	6137815	0.0088	0.0050	<0.0050	0.0050	0.0091	0.0050	6138362
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	0.0078	0.0050	0.0060	0.0050	6138362
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	6138362
Chrysene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	0.0052	0.0050	6138362
Dibenz(a,h)anthracene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	6138362
Fluoranthene	ug/g	0.047	0.0050	6137815	0.011	0.0050	0.0060	0.0050	0.013	0.0050	6138362
Fluorene	ug/g	0.41	0.0050	6137815	<0.050 (1)	0.050	<0.0050	0.0050	<0.010 (1)	0.010	6138362
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0050	6137815	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	6138362
1-Methylnaphthalene	ug/g	1.5	0.0050	6137815	<0.050 (1)	0.050	<0.0050	0.0050	<0.0050	0.0050	6138362
2-Methylnaphthalene	ug/g	1.9	0.0050	6137815	<0.050 (1)	0.050	<0.0050	0.0050	<0.0050	0.0050	6138362
Naphthalene	ug/g	0.28	0.0050	6137815	<0.010 (1)	0.010	<0.0050	0.0050	<0.0050	0.0050	6138362
Phenanthrene	ug/g	0.79	0.0050	6137815	0.031 (1)	0.0050	0.0050	0.0050	0.020	0.0050	6138362
Pyrene	ug/g	0.083	0.0050	6137815	0.033	0.0050	<0.0050	0.0050	0.011	0.0050	6138362
Surrogate Recovery (%)											
D10-Anthracene	%	106		6137815	109		100		107		6138362
D14-Terphenyl (FS)	%	98		6137815	99		86		95		6138362
D8-Acenaphthylene	%	101		6137815	106		85		92		6138362
RDL = Reportable Detection Limit											
QC Batch = Quality Control Batch											
(1) DL was raised due to matrix interference.											

O.REG 153 PAHS (SOIL)

Maxxam ID		JTM694		
Sampling Date		2019/05/15		
COC Number		na		
	UNITS	DUP-3	RDL	QC Batch
Inorganics				
Moisture	%	26	1.0	6135753
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/g	<0.011	0.011	6133256
Polyaromatic Hydrocarbons				
Acenaphthene	ug/g	<0.0050	0.0050	6138362
Acenaphthylene	ug/g	<0.0050	0.0050	6138362
Anthracene	ug/g	<0.020 (1)	0.020	6138362
Benzo(a)anthracene	ug/g	<0.0050	0.0050	6138362
Benzo(a)pyrene	ug/g	0.0068	0.0050	6138362
Benzo(b/j)fluoranthene	ug/g	0.013	0.0050	6138362
Benzo(g,h,i)perylene	ug/g	0.011	0.0050	6138362
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	6138362
Chrysene	ug/g	0.0055	0.0050	6138362
Dibenz(a,h)anthracene	ug/g	<0.0050	0.0050	6138362
Fluoranthene	ug/g	0.013	0.0050	6138362
Fluorene	ug/g	<0.020 (1)	0.020	6138362
Indeno(1,2,3-cd)pyrene	ug/g	0.0063	0.0050	6138362
1-Methylnaphthalene	ug/g	<0.0050	0.0050	6138362
2-Methylnaphthalene	ug/g	<0.010 (1)	0.010	6138362
Naphthalene	ug/g	<0.010 (1)	0.010	6138362
Phenanthrene	ug/g	<0.010 (1)	0.010	6138362
Pyrene	ug/g	0.045	0.0050	6138362
Surrogate Recovery (%)				
D10-Anthracene	%	107		6138362
D14-Terphenyl (FS)	%	97		6138362
D8-Acenaphthylene	%	99		6138362
RDL = Reportable Detection Limit QC Batch = Quality Control Batch (1) DL was raised due to matrix interference.				

O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		JTM682	JTM685		
Sampling Date		2019/05/15	2019/05/15		
COC Number		na	na		
	UNITS	BH19-12 SS4	BH19-13 SS4	RDL	QC Batch
Inorganics					
Moisture	%	11	16	1.0	6135753
BTEX & F1 Hydrocarbons					
Benzene	ug/g	<0.020	<0.020	0.020	6136880
Toluene	ug/g	<0.020	<0.020	0.020	6136880
Ethylbenzene	ug/g	<0.020	<0.020	0.020	6136880
o-Xylene	ug/g	<0.020	<0.020	0.020	6136880
p+m-Xylene	ug/g	<0.040	<0.040	0.040	6136880
Total Xylenes	ug/g	<0.040	<0.040	0.040	6136880
F1 (C6-C10)	ug/g	<10	11	10	6136880
F1 (C6-C10) - BTEX	ug/g	<10	11	10	6136880
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/g	<10	240	10	6135755
F3 (C16-C34 Hydrocarbons)	ug/g	<50	120	50	6135755
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	50	6135755
Reached Baseline at C50	ug/g	Yes	Yes		6135755
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	99	98		6136880
4-Bromofluorobenzene	%	97	98		6136880
D10-Ethylbenzene	%	126	120		6136880
D4-1,2-Dichloroethane	%	93	92		6136880
o-Terphenyl	%	104	104		6135755
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					

O.REG 153 VOCs BY HS & F1-F4 (SOIL)

Maxxam ID		JTM681		JTM684	JTM686	JTM688	JTM691		
Sampling Date		2019/05/15		2019/05/15	2019/05/15	2019/05/15	2019/05/15		
COC Number		na		na	na	na	na		
	UNITS	BH19-12 SS2	QC Batch	BH19-13 SS2	BH19-14 SS2	BH19-15 SS2	BH19-17 SS2	RDL	QC Batch
Inorganics									
Moisture	%	19	6135753	18	19	17	18	1.0	6135753
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	6133113	<0.050	<0.050	<0.050	<0.050	0.050	6133113
Volatile Organics									
Acetone (2-Propanone)	ug/g	<0.50	6135464	<0.50	<0.50	<0.50	<0.50	0.50	6135464
Benzene	ug/g	<0.020	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
Bromodichloromethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Bromoform	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Bromomethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Carbon Tetrachloride	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Chlorobenzene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Chloroform	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Dibromochloromethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,2-Dichlorobenzene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,3-Dichlorobenzene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,4-Dichlorobenzene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,1-Dichloroethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,2-Dichloroethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,1-Dichloroethylene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
cis-1,2-Dichloroethylene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
trans-1,2-Dichloroethylene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,2-Dichloropropane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
cis-1,3-Dichloropropene	ug/g	<0.030	6135464	<0.030	<0.030	<0.030	<0.030	0.030	6135464
trans-1,3-Dichloropropene	ug/g	<0.040	6135464	<0.040	<0.040	<0.040	<0.040	0.040	6135464
Ethylbenzene	ug/g	0.13	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
Ethylene Dibromide	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Hexane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Methylene Chloride(Dichloromethane)	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	6135464	<0.50	<0.50	<0.50	<0.50	0.50	6135464
Methyl Isobutyl Ketone	ug/g	<0.50	6135464	<0.50	<0.50	<0.50	<0.50	0.50	6135464
Methyl t-butyl ether (MTBE)	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

O.REG 153 VOCs BY HS & F1-F4 (SOIL)

Maxxam ID		JTM681		JTM684	JTM686	JTM688	JTM691		
Sampling Date		2019/05/15		2019/05/15	2019/05/15	2019/05/15	2019/05/15		
COC Number		na		na	na	na	na		
	UNITS	BH19-12 SS2	QC Batch	BH19-13 SS2	BH19-14 SS2	BH19-15 SS2	BH19-17 SS2	RDL	QC Batch
Styrene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,1,1,2-Tetrachloroethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,1,2,2-Tetrachloroethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Tetrachloroethylene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Toluene	ug/g	<0.020	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
1,1,1-Trichloroethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
1,1,2-Trichloroethane	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Trichloroethylene	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	6135464	<0.050	<0.050	<0.050	<0.050	0.050	6135464
Vinyl Chloride	ug/g	<0.020	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
p+m-Xylene	ug/g	1.4	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
o-Xylene	ug/g	0.87	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
Total Xylenes	ug/g	2.3	6135464	<0.020	<0.020	<0.020	<0.020	0.020	6135464
F1 (C6-C10)	ug/g	71	6135464	13	<10	<10	<10	10	6135464
F1 (C6-C10) - BTEX	ug/g	69	6135464	13	<10	<10	<10	10	6135464
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/g	1100	6137808	120	<10	<10	<10	10	6135755
F3 (C16-C34 Hydrocarbons)	ug/g	620	6137808	56	<50	<50	<50	50	6135755
F4 (C34-C50 Hydrocarbons)	ug/g	<50	6137808	<50	<50	<50	<50	50	6135755
Reached Baseline at C50	ug/g	Yes	6137808	Yes	Yes	Yes	Yes		6135755
Surrogate Recovery (%)									
o-Terphenyl	%	95	6137808	105	102	105	106		6135755
4-Bromofluorobenzene	%	98	6135464	97	94	93	94		6135464
D10-o-Xylene	%	115	6135464	130	119	112	114		6135464
D4-1,2-Dichloroethane	%	105	6135464	100	101	101	101		6135464
D8-Toluene	%	101	6135464	101	101	100	101		6135464
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

RESULTS OF ANALYSES OF SOIL

Maxxam ID		JTM695		
Sampling Date		2019/05/15		
COC Number		na		
	UNITS	DUP-4	RDL	QC Batch
Inorganics				
Moisture	%	20	1.0	6135753
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		JTM695		
Sampling Date		2019/05/15		
COC Number		na		
	UNITS	DUP-4	RDL	QC Batch
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	6135755
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	6135755
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	6135755
Reached Baseline at C50	ug/g	Yes		6135755
Surrogate Recovery (%)				
o-Terphenyl	%	103		6135755
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

TEST SUMMARY

Maxxam ID: JTM680
Sample ID: BH19-12 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
pH CaCl2 EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

Maxxam ID: JTM681
Sample ID: BH19-12 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6133256	N/A	2019/05/27	Automated Statchk
1,3-Dichloropropene Sum	CALC	6133113	N/A	2019/05/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6137808	2019/05/23	2019/05/24	Prabhjot Gulati
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6137815	2019/05/23	2019/05/25	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6135464	N/A	2019/05/23	Rebecca McClean

Maxxam ID: JTM682
Sample ID: BH19-12 SS4
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6136880	N/A	2019/05/24	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang

Maxxam ID: JTM683
Sample ID: BH19-13 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6133256	N/A	2019/05/27	Automated Statchk
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6138362	2019/05/24	2019/05/24	Mitesh Raj
pH CaCl2 EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

TEST SUMMARY

Maxxam ID: JTM684
Sample ID: BH19-13 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6133113	N/A	2019/05/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6135464	N/A	2019/05/23	Rebecca McClean

Maxxam ID: JTM685
Sample ID: BH19-13 SS4
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	6136880	N/A	2019/05/24	Abdi Mohamud
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang

Maxxam ID: JTM686
Sample ID: BH19-14 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
1,3-Dichloropropene Sum	CALC	6133113	N/A	2019/05/24	Automated Statchk
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
pH CaCl2 EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6135464	N/A	2019/05/23	Rebecca McClean

Maxxam ID: JTM686 Dup
Sample ID: BH19-14 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu

Maxxam ID: JTM687
Sample ID: BH19-15 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva

TEST SUMMARY

Maxxam ID: JTM687
Sample ID: BH19-15 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
pH CaCl ₂ EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

Maxxam ID: JTM687 Dup
Sample ID: BH19-15 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva

Maxxam ID: JTM688
Sample ID: BH19-15 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6133113	N/A	2019/05/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6135464	N/A	2019/05/23	Rebecca McClean

Maxxam ID: JTM689
Sample ID: BH19-16 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6133256	N/A	2019/05/27	Automated Statchk
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6138362	2019/05/24	2019/05/24	Mitesh Raj
pH CaCl ₂ EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

Maxxam ID: JTM690
Sample ID: BH19-17 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani

TEST SUMMARY

Maxxam ID: JTM690
Sample ID: BH19-17 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
pH CaCl2 EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

Maxxam ID: JTM690 Dup
Sample ID: BH19-17 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang

Maxxam ID: JTM691
Sample ID: BH19-17 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6133113	N/A	2019/05/24	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6135464	N/A	2019/05/23	Rebecca McClean

Maxxam ID: JTM692
Sample ID: BH19-18 SS1
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6133256	N/A	2019/05/27	Automated Statchk
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6138362	2019/05/24	2019/05/24	Mitesh Raj
pH CaCl2 EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

Maxxam ID: JTM693
Sample ID: BH19-19 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6136038	2019/05/23	2019/05/23	Azita Fazaeli

TEST SUMMARY

Maxxam ID: JTM693
Sample ID: BH19-19 SS2
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	6136048	2019/05/23	2019/05/27	Barbara Kalbasi Esfahani
Conductivity	AT	6136249	2019/05/23	2019/05/23	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	6135946	2019/05/23	2019/05/23	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6136002	2019/05/23	2019/05/23	Daniel Teclu
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
pH CaCl2 EXTRACT	AT	6135911	2019/05/23	2019/05/23	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	6133187	N/A	2019/05/24	Automated Statchk

Maxxam ID: JTM694
Sample ID: DUP-3
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6133256	N/A	2019/05/27	Automated Statchk
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6138362	2019/05/24	2019/05/24	Mitesh Raj

Maxxam ID: JTM695
Sample ID: DUP-4
Matrix: Soil

Collected: 2019/05/15
Shipped:
Received: 2019/05/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6135755	2019/05/23	2019/05/23	Anna Stuglik Rolland
Moisture	BAL	6135753	N/A	2019/05/16	Min Yang

GENERAL COMMENTS

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

Package 1	7.7°C
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Results relate only to the items tested.

QUALITY ASSURANCE REPORT

DS Consultants Limited
Client Project #: 18-692-100
Site Location: FORCE 1 EF
Sampler Initials: TL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6135464	4-Bromofluorobenzene	2019/05/23	99	60 - 140	99	60 - 140	93	%		
6135464	D10-o-Xylene	2019/05/23	105	60 - 130	104	60 - 130	93	%		
6135464	D4-1,2-Dichloroethane	2019/05/23	104	60 - 140	103	60 - 140	103	%		
6135464	D8-Toluene	2019/05/23	103	60 - 140	101	60 - 140	102	%		
6135755	o-Terphenyl	2019/05/23	113	60 - 130	109	60 - 130	101	%		
6136880	1,4-Difluorobenzene	2019/05/23	101	60 - 140	102	60 - 140	102	%		
6136880	4-Bromofluorobenzene	2019/05/23	99	60 - 140	98	60 - 140	101	%		
6136880	D10-Ethylbenzene	2019/05/23	111	60 - 140	102	60 - 140	103	%		
6136880	D4-1,2-Dichloroethane	2019/05/23	98	60 - 140	100	60 - 140	98	%		
6137808	o-Terphenyl	2019/05/24	86	60 - 130	87	60 - 130	89	%		
6137815	D10-Anthracene	2019/05/25	107	50 - 130	111	50 - 130	104	%		
6137815	D14-Terphenyl (FS)	2019/05/25	95	50 - 130	98	50 - 130	92	%		
6137815	D8-Acenaphthylene	2019/05/25	88	50 - 130	93	50 - 130	88	%		
6138362	D10-Anthracene	2019/05/24	115	50 - 130	106	50 - 130	101	%		
6138362	D14-Terphenyl (FS)	2019/05/24	103	50 - 130	92	50 - 130	86	%		
6138362	D8-Acenaphthylene	2019/05/24	101	50 - 130	91	50 - 130	85	%		
6135464	1,1,1,2-Tetrachloroethane	2019/05/23	97	60 - 140	91	60 - 130	<0.050	ug/g	NC	50
6135464	1,1,1-Trichloroethane	2019/05/23	93	60 - 140	88	60 - 130	<0.050	ug/g	NC	50
6135464	1,1,2,2-Tetrachloroethane	2019/05/23	103	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
6135464	1,1,2-Trichloroethane	2019/05/23	103	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
6135464	1,1-Dichloroethane	2019/05/23	98	60 - 140	93	60 - 130	<0.050	ug/g	NC	50
6135464	1,1-Dichloroethylene	2019/05/23	96	60 - 140	90	60 - 130	<0.050	ug/g	NC	50
6135464	1,2-Dichlorobenzene	2019/05/23	99	60 - 140	94	60 - 130	<0.050	ug/g	NC	50
6135464	1,2-Dichloroethane	2019/05/23	99	60 - 140	92	60 - 130	<0.050	ug/g	NC	50
6135464	1,2-Dichloropropane	2019/05/23	96	60 - 140	91	60 - 130	<0.050	ug/g	NC	50
6135464	1,3-Dichlorobenzene	2019/05/23	101	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
6135464	1,4-Dichlorobenzene	2019/05/23	110	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
6135464	Acetone (2-Propanone)	2019/05/23	108	60 - 140	101	60 - 140	<0.50	ug/g	NC	50
6135464	Benzene	2019/05/23	93	60 - 140	88	60 - 130	<0.020	ug/g	NC	50
6135464	Bromodichloromethane	2019/05/23	95	60 - 140	89	60 - 130	<0.050	ug/g	NC	50
6135464	Bromoform	2019/05/23	95	60 - 140	89	60 - 130	<0.050	ug/g	NC	50
6135464	Bromomethane	2019/05/23	108	60 - 140	100	60 - 140	<0.050	ug/g	NC	50

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
Client Project #: 18-692-100
Site Location: FORCE 1 EF
Sampler Initials: TL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6135464	Carbon Tetrachloride	2019/05/23	92	60 - 140	87	60 - 130	<0.050	ug/g	NC	50
6135464	Chlorobenzene	2019/05/23	97	60 - 140	90	60 - 130	<0.050	ug/g	NC	50
6135464	Chloroform	2019/05/23	98	60 - 140	91	60 - 130	<0.050	ug/g	NC	50
6135464	cis-1,2-Dichloroethylene	2019/05/23	96	60 - 140	90	60 - 130	<0.050	ug/g	NC	50
6135464	cis-1,3-Dichloropropene	2019/05/23	111	60 - 140	103	60 - 130	<0.030	ug/g	NC	50
6135464	Dibromochloromethane	2019/05/23	106	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
6135464	Dichlorodifluoromethane (FREON 12)	2019/05/23	90	60 - 140	85	60 - 140	<0.050	ug/g	NC	50
6135464	Ethylbenzene	2019/05/23	98	60 - 140	92	60 - 130	<0.020	ug/g	NC	50
6135464	Ethylene Dibromide	2019/05/23	102	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
6135464	F1 (C6-C10) - BTEX	2019/05/23					<10	ug/g	NC	30
6135464	F1 (C6-C10)	2019/05/23	91	60 - 140	92	80 - 120	<10	ug/g	NC	30
6135464	Hexane	2019/05/23	89	60 - 140	85	60 - 130	<0.050	ug/g	NC	50
6135464	Methyl Ethyl Ketone (2-Butanone)	2019/05/23	111	60 - 140	105	60 - 140	<0.50	ug/g	NC	50
6135464	Methyl Isobutyl Ketone	2019/05/23	105	60 - 140	99	60 - 130	<0.50	ug/g	NC	50
6135464	Methyl t-butyl ether (MTBE)	2019/05/23	93	60 - 140	88	60 - 130	<0.050	ug/g	NC	50
6135464	Methylene Chloride(Dichloromethane)	2019/05/23	101	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
6135464	o-Xylene	2019/05/23	95	60 - 140	90	60 - 130	<0.020	ug/g	0.81	50
6135464	p+m-Xylene	2019/05/23	94	60 - 140	89	60 - 130	<0.020	ug/g	1.8	50
6135464	Styrene	2019/05/23	97	60 - 140	91	60 - 130	<0.050	ug/g	NC	50
6135464	Tetrachloroethylene	2019/05/23	97	60 - 140	92	60 - 130	<0.050	ug/g	NC	50
6135464	Toluene	2019/05/23	95	60 - 140	89	60 - 130	<0.020	ug/g	NC	50
6135464	Total Xylenes	2019/05/23					<0.020	ug/g	0.42	50
6135464	trans-1,2-Dichloroethylene	2019/05/23	94	60 - 140	89	60 - 130	<0.050	ug/g	NC	50
6135464	trans-1,3-Dichloropropene	2019/05/23	130	60 - 140	116	60 - 130	<0.040	ug/g	NC	50
6135464	Trichloroethylene	2019/05/23	92	60 - 140	87	60 - 130	<0.050	ug/g	NC	50
6135464	Trichlorofluoromethane (FREON 11)	2019/05/23	95	60 - 140	90	60 - 130	<0.050	ug/g	NC	50
6135464	Vinyl Chloride	2019/05/23	98	60 - 140	91	60 - 130	<0.020	ug/g	NC	50
6135753	Moisture	2019/05/16							5.4	20
6135755	F2 (C10-C16 Hydrocarbons)	2019/05/23	112	50 - 130	98	80 - 120	<10	ug/g	NC	30
6135755	F3 (C16-C34 Hydrocarbons)	2019/05/23	111	50 - 130	100	80 - 120	<50	ug/g	NC	30
6135755	F4 (C34-C50 Hydrocarbons)	2019/05/23	107	50 - 130	106	80 - 120	<50	ug/g	NC	30
6135911	Available (CaCl2) pH	2019/05/23			100	97 - 103			0.30	N/A

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
Client Project #: 18-692-100
Site Location: FORCE 1 EF
Sampler Initials: TL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6135946	Chromium (VI)	2019/05/23	16 (1)	70 - 130	90	80 - 120	<0.2	ug/g	NC	35
6136002	Acid Extractable Antimony (Sb)	2019/05/23	94	75 - 125	100	80 - 120	<0.20	ug/g	3.5	30
6136002	Acid Extractable Arsenic (As)	2019/05/23	104	75 - 125	101	80 - 120	<1.0	ug/g	4.1	30
6136002	Acid Extractable Barium (Ba)	2019/05/23	NC	75 - 125	104	80 - 120	<0.50	ug/g	0.75	30
6136002	Acid Extractable Beryllium (Be)	2019/05/23	107	75 - 125	97	80 - 120	<0.20	ug/g	0.24	30
6136002	Acid Extractable Boron (B)	2019/05/23	104	75 - 125	97	80 - 120	<5.0	ug/g	5.4	30
6136002	Acid Extractable Cadmium (Cd)	2019/05/23	106	75 - 125	97	80 - 120	<0.10	ug/g	21	30
6136002	Acid Extractable Chromium (Cr)	2019/05/23	NC	75 - 125	100	80 - 120	<1.0	ug/g	2.0	30
6136002	Acid Extractable Cobalt (Co)	2019/05/23	103	75 - 125	101	80 - 120	<0.10	ug/g	0.82	30
6136002	Acid Extractable Copper (Cu)	2019/05/23	NC	75 - 125	101	80 - 120	<0.50	ug/g	2.7	30
6136002	Acid Extractable Lead (Pb)	2019/05/23	105	75 - 125	101	80 - 120	<1.0	ug/g	1.6	30
6136002	Acid Extractable Mercury (Hg)	2019/05/23	101	75 - 125	96	80 - 120	<0.050	ug/g	NC	30
6136002	Acid Extractable Molybdenum (Mo)	2019/05/23	105	75 - 125	99	80 - 120	<0.50	ug/g	NC	30
6136002	Acid Extractable Nickel (Ni)	2019/05/23	NC	75 - 125	103	80 - 120	<0.50	ug/g	0.64	30
6136002	Acid Extractable Selenium (Se)	2019/05/23	108	75 - 125	102	80 - 120	<0.50	ug/g	NC	30
6136002	Acid Extractable Silver (Ag)	2019/05/23	104	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
6136002	Acid Extractable Thallium (Tl)	2019/05/23	104	75 - 125	101	80 - 120	<0.050	ug/g	0.90	30
6136002	Acid Extractable Uranium (U)	2019/05/23	105	75 - 125	99	80 - 120	<0.050	ug/g	1.8	30
6136002	Acid Extractable Vanadium (V)	2019/05/23	NC	75 - 125	99	80 - 120	<5.0	ug/g	3.9	30
6136002	Acid Extractable Zinc (Zn)	2019/05/23	NC	75 - 125	97	80 - 120	<5.0	ug/g	0.64	30
6136038	Hot Water Ext. Boron (B)	2019/05/23	101	75 - 125	100	75 - 125	<0.050	ug/g	NC	40
6136048	WAD Cyanide (Free)	2019/05/27	96	75 - 125	104	80 - 120	<0.01	ug/g	NC	35
6136249	Conductivity	2019/05/23			102	90 - 110	<0.002	mS/cm	3.7	10
6136880	Benzene	2019/05/23	94	60 - 140	100	60 - 140	<0.020	ug/g	NC	50
6136880	Ethylbenzene	2019/05/23	95	60 - 140	102	60 - 140	<0.020	ug/g	NC	50
6136880	F1 (C6-C10) - BTEX	2019/05/23					<10	ug/g	NC	30
6136880	F1 (C6-C10)	2019/05/23	100	60 - 140	98	80 - 120	<10	ug/g	NC	30
6136880	o-Xylene	2019/05/23	95	60 - 140	99	60 - 140	<0.020	ug/g	NC	50
6136880	p+m-Xylene	2019/05/23	97	60 - 140	104	60 - 140	<0.040	ug/g	NC	50
6136880	Toluene	2019/05/23	95	60 - 140	101	60 - 140	<0.020	ug/g	NC	50
6136880	Total Xylenes	2019/05/23					<0.040	ug/g	NC	50
6137808	F2 (C10-C16 Hydrocarbons)	2019/05/24	91	50 - 130	91	80 - 120	<10	ug/g	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
Client Project #: 18-692-100
Site Location: FORCE 1 EF
Sampler Initials: TL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6137808	F3 (C16-C34 Hydrocarbons)	2019/05/24	89	50 - 130	89	80 - 120	<50	ug/g	NC	30
6137808	F4 (C34-C50 Hydrocarbons)	2019/05/24	88	50 - 130	89	80 - 120	<50	ug/g	NC	30
6137815	1-Methylnaphthalene	2019/05/25	107	50 - 130	112	50 - 130	<0.0050	ug/g	NC	40
6137815	2-Methylnaphthalene	2019/05/25	99	50 - 130	104	50 - 130	<0.0050	ug/g	NC	40
6137815	Acenaphthene	2019/05/25	98	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
6137815	Acenaphthylene	2019/05/25	98	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
6137815	Anthracene	2019/05/25	100	50 - 130	101	50 - 130	<0.0050	ug/g	NC	40
6137815	Benzo(a)anthracene	2019/05/25	106	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
6137815	Benzo(a)pyrene	2019/05/25	99	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40
6137815	Benzo(b,j)fluoranthene	2019/05/25	100	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40
6137815	Benzo(g,h,i)perylene	2019/05/25	63	50 - 130	70	50 - 130	<0.0050	ug/g	NC	40
6137815	Benzo(k)fluoranthene	2019/05/25	98	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
6137815	Chrysene	2019/05/25	85	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
6137815	Dibenz(a,h)anthracene	2019/05/25	90	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
6137815	Fluoranthene	2019/05/25	106	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
6137815	Fluorene	2019/05/25	99	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
6137815	Indeno(1,2,3-cd)pyrene	2019/05/25	75	50 - 130	82	50 - 130	<0.0050	ug/g	NC	40
6137815	Naphthalene	2019/05/25	89	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40
6137815	Phenanthrene	2019/05/25	102	50 - 130	103	50 - 130	<0.0050	ug/g	NC	40
6137815	Pyrene	2019/05/25	106	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
6138362	1-Methylnaphthalene	2019/05/24	124	50 - 130	112	50 - 130	<0.0050	ug/g	NC	40
6138362	2-Methylnaphthalene	2019/05/24	115	50 - 130	103	50 - 130	<0.0050	ug/g	NC	40
6138362	Acenaphthene	2019/05/24	110	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
6138362	Acenaphthylene	2019/05/24	111	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
6138362	Anthracene	2019/05/24	110	50 - 130	100	50 - 130	<0.0050	ug/g	5.2	40
6138362	Benzo(a)anthracene	2019/05/24	123	50 - 130	104	50 - 130	<0.0050	ug/g	3.2	40
6138362	Benzo(a)pyrene	2019/05/24	113	50 - 130	101	50 - 130	<0.0050	ug/g	4.4	40
6138362	Benzo(b,j)fluoranthene	2019/05/24	106	50 - 130	100	50 - 130	<0.0050	ug/g	5.0	40
6138362	Benzo(g,h,i)perylene	2019/05/24	94	50 - 130	100	50 - 130	<0.0050	ug/g	9.4	40
6138362	Benzo(k)fluoranthene	2019/05/24	104	50 - 130	97	50 - 130	<0.0050	ug/g	3.3	40
6138362	Chrysene	2019/05/24	99	50 - 130	85	50 - 130	<0.0050	ug/g	4.0	40
6138362	Dibenz(a,h)anthracene	2019/05/24	126	50 - 130	122	50 - 130	<0.0050	ug/g	7.5	40

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
Client Project #: 18-692-100
Site Location: FORCE 1 EF
Sampler Initials: TL

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6138362	Fluoranthene	2019/05/24	134 (2)	50 - 130	105	50 - 130	<0.0050	ug/g	2.9	40
6138362	Fluorene	2019/05/24	111	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
6138362	Indeno(1,2,3-cd)pyrene	2019/05/24	107	50 - 130	107	50 - 130	<0.0050	ug/g	7.4	40
6138362	Naphthalene	2019/05/24	104	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40
6138362	Phenanthrene	2019/05/24	120	50 - 130	103	50 - 130	<0.0050	ug/g	1.6	40
6138362	Pyrene	2019/05/24	131 (3)	50 - 130	105	50 - 130	<0.0050	ug/g	2.9	40

N/A = Not Applicable

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 $\leq 2 \times \text{RDL}$).


(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The sample was reanalyzed with the same results.

(2) The recovery was above the upper control limit. This may represent a high bias in some results for flagged analytes. For results that were not detected (ND), this potential bias has no impact.

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

VALIDATION SIGNATURE PAGE

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



Ewa Pranjić, M.Sc., C.Chem, Scientific Specialist

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

Your Project #: 18-692-100
Site#: Parcels E-F
Site Location: Derry-Brittania Lands, Ninth Line
Your C.O.C. #: 85831

Attention: Rick Fioravanti

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2019/05/28
Report #: R5728993
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D8114

Received: 2019/05/23, 14:35

Sample Matrix: Water
Samples Received: 6

Analyses	Date		Laboratory Method	Reference
	Quantity	Extracted	Analyzed	
1,3-Dichloropropene Sum	5	N/A	2019/05/27	EPA 8260C m
1,3-Dichloropropene Sum	1	N/A	2019/05/28	EPA 8260C m
Chloride by Automated Colourimetry	5	N/A	2019/05/27 CAM SOP-00463	SM 4500-Cl E m
Chromium (VI) in Water	5	N/A	2019/05/27 CAM SOP-00436	EPA 7199 m
Free (WAD) Cyanide	5	N/A	2019/05/26 CAM SOP-00457	OMOE E3015 m
Petroleum Hydrocarbons F2-F4 in Water (1)	5	2019/05/27	2019/05/28 CAM SOP-00316	CCME PHC-CWS m
Mercury	5	2019/05/25	2019/05/27 CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	5	N/A	2019/05/27 CAM SOP-00447	EPA 6020B m
Volatile Organic Compounds and F1 PHCs	5	N/A	2019/05/25 CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water	1	N/A	2019/05/27 CAM SOP-00228	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025 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.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's

Your Project #: 18-692-100
Site#: Parcels E-F
Site Location: Derry-Brittania Lands, Ninth Line
Your C.O.C. #: 85831

Attention: Rick Fioravanti

DS Consultants Limited
6221 Highway 7, Unit 16
Vaughan, ON
CANADA L4H 0K8

Report Date: 2019/05/28
Report #: R5728993
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D8114

Received: 2019/05/23, 14:35

Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

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

Ashton Gibson, Project Manager

Email: AGibson@maxxam.ca

Phone# (905)817-5765

=====

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.

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID			JUG804			JUG804			JUG805		
Sampling Date			2019/05/22 12:00			2019/05/22 12:00			2019/05/22 14:00		
COC Number			85831			85831			85831		
	UNITS	Criteria	BH19-12	RDL	QC Batch	BH19-12 Lab-Dup	RDL	QC Batch	BH19-15	RDL	QC Batch
Inorganics											
WAD Cyanide (Free)	ug/L	5	<1	1	6141349	<1	1	6141349	<1	1	6141349
Dissolved Chloride (Cl-)	mg/L	790	200	2.0	6138633				370	4.0	6138669
Metals											
Chromium (VI)	ug/L	25	<0.50	0.50	6131206				<0.50	0.50	6131206
Mercury (Hg)	ug/L	0.1	<0.1	0.1	6140620				<0.1	0.1	6140620
Dissolved Antimony (Sb)	ug/L	1.5	<0.50	0.50	6138969				<0.50	0.50	6138969
Dissolved Arsenic (As)	ug/L	13	2.1	1.0	6138969				1.2	1.0	6138969
Dissolved Barium (Ba)	ug/L	610	60	2.0	6138969				140	2.0	6138969
Dissolved Beryllium (Be)	ug/L	0.5	<0.50	0.50	6138969				<0.50	0.50	6138969
Dissolved Boron (B)	ug/L	1700	330	10	6138969				74	10	6138969
Dissolved Cadmium (Cd)	ug/L	0.5	<0.10	0.10	6138969				<0.10	0.10	6138969
Dissolved Chromium (Cr)	ug/L	11	<5.0	5.0	6138969				<5.0	5.0	6138969
Dissolved Cobalt (Co)	ug/L	3.8	1.1	0.50	6138969				4.3	0.50	6138969
Dissolved Copper (Cu)	ug/L	5	1.9	1.0	6138969				2.6	1.0	6138969
Dissolved Lead (Pb)	ug/L	1.9	<0.50	0.50	6138969				<0.50	0.50	6138969
Dissolved Molybdenum (Mo)	ug/L	23	7.1	0.50	6138969				1.3	0.50	6138969
Dissolved Nickel (Ni)	ug/L	14	2.7	1.0	6138969				5.0	1.0	6138969
Dissolved Selenium (Se)	ug/L	5	<2.0	2.0	6138969				<2.0	2.0	6138969
Dissolved Silver (Ag)	ug/L	0.3	<0.10	0.10	6138969				<0.10	0.10	6138969
Dissolved Sodium (Na)	ug/L	490000	140000	100	6138969				240000	100	6138969
Dissolved Thallium (Tl)	ug/L	0.5	<0.050	0.050	6138969				<0.050	0.050	6138969
Dissolved Uranium (U)	ug/L	8.9	1.8	0.10	6138969				3.7	0.10	6138969
Dissolved Vanadium (V)	ug/L	3.9	<0.50	0.50	6138969				0.63	0.50	6138969
Dissolved Zinc (Zn)	ug/L	160	<5.0	5.0	6138969				6.8	5.0	6138969
No Fill	No Exceedance										
Grey	Exceeds 1 criteria policy/level										
Black	Exceeds both criteria/levels										
RDL = Reportable Detection Limit											
QC Batch = Quality Control Batch											
Lab-Dup = Laboratory Initiated Duplicate											
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)											
Table 1: Full Depth Background Site Condition Standards											
Ground Water - All Types of Property Uses											

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID			JUG806			JUG807		JUG808		
Sampling Date			2019/05/22			2019/05/22		2019/05/22		
COC Number			85831			85831		85831		
	UNITS	Criteria	DUP-E	RDL	QC Batch	BH19-18	RDL	BH19-17	RDL	QC Batch
Inorganics										
WAD Cyanide (Free)	ug/L	5	<1	1	6141349	<1	1	<1	1	6141349
Dissolved Chloride (Cl-)	mg/L	790	200	2.0	6138660	1200	15	160	2.0	6138669
Metals										
Chromium (VI)	ug/L	25	<0.50	0.50	6131206	<0.50	0.50	<0.50	0.50	6131206
Mercury (Hg)	ug/L	0.1	<0.1	0.1	6140620	<0.1	0.1	<0.1	0.1	6140620
Dissolved Antimony (Sb)	ug/L	1.5	<0.50	0.50	6138969	<0.50	0.50	<0.50	0.50	6138969
Dissolved Arsenic (As)	ug/L	13	2.2	1.0	6138969	2.3	1.0	<1.0	1.0	6138969
Dissolved Barium (Ba)	ug/L	610	57	2.0	6138969	53	2.0	73	2.0	6138969
Dissolved Beryllium (Be)	ug/L	0.5	<0.50	0.50	6138969	<0.50	0.50	<0.50	0.50	6138969
Dissolved Boron (B)	ug/L	1700	310	10	6138969	600	10	140	10	6138969
Dissolved Cadmium (Cd)	ug/L	0.5	<0.10	0.10	6138969	<0.10	0.10	<0.10	0.10	6138969
Dissolved Chromium (Cr)	ug/L	11	<5.0	5.0	6138969	<5.0	5.0	<5.0	5.0	6138969
Dissolved Cobalt (Co)	ug/L	3.8	0.94	0.50	6138969	1.0	0.50	2.3	0.50	6138969
Dissolved Copper (Cu)	ug/L	5	<1.0	1.0	6138969	2.9	1.0	2.1	1.0	6138969
Dissolved Lead (Pb)	ug/L	1.9	<0.50	0.50	6138969	<0.50	0.50	<0.50	0.50	6138969
Dissolved Molybdenum (Mo)	ug/L	23	6.7	0.50	6138969	6.5	0.50	0.60	0.50	6138969
Dissolved Nickel (Ni)	ug/L	14	2.3	1.0	6138969	1.6	1.0	6.4	1.0	6138969
Dissolved Selenium (Se)	ug/L	5	<2.0	2.0	6138969	<2.0	2.0	<2.0	2.0	6138969
Dissolved Silver (Ag)	ug/L	0.3	<0.10	0.10	6138969	<0.10	0.10	<0.10	0.10	6138969
Dissolved Sodium (Na)	ug/L	490000	130000	100	6138969	510000	100	84000	100	6138969
Dissolved Thallium (Tl)	ug/L	0.5	<0.050	0.050	6138969	<0.050	0.050	<0.050	0.050	6138969
Dissolved Uranium (U)	ug/L	8.9	1.7	0.10	6138969	1.5	0.10	3.7	0.10	6138969
Dissolved Vanadium (V)	ug/L	3.9	<0.50	0.50	6138969	<0.50	0.50	<0.50	0.50	6138969
Dissolved Zinc (Zn)	ug/L	160	<5.0	5.0	6138969	<5.0	5.0	<5.0	5.0	6138969
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)										
Table 1: Full Depth Background Site Condition Standards										
Ground Water - All Types of Property Uses										

O.REG 153 VOCs BY HS & F1-F4 (WATER)

Maxxam ID			JUG804	JUG805	JUG806	JUG807	JUG808		
Sampling Date			2019/05/22 12:00	2019/05/22 14:00	2019/05/22	2019/05/22	2019/05/22		
COC Number			85831	85831	85831	85831	85831		
	UNITS	Criteria	BH19-12	BH19-15	DUP-E	BH19-18	BH19-17	RDL	QC Batch
Calculated Parameters									
1,3-Dichloropropene (cis+trans)	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6136767
Volatile Organics									
Acetone (2-Propanone)	ug/L	2700	<10	<10	<10	<10	18	10	6125681
Benzene	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Bromodichloromethane	ug/L	2	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Bromoform	ug/L	5.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6125681
Bromomethane	ug/L	0.89	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Carbon Tetrachloride	ug/L	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Chlorobenzene	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Chloroform	ug/L	2	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Dibromochloromethane	ug/L	2	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,2-Dichlorobenzene	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,3-Dichlorobenzene	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,4-Dichlorobenzene	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Dichlorodifluoromethane (FREON 12)	ug/L	590	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6125681
1,1-Dichloroethane	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
1,2-Dichloroethane	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,1-Dichloroethylene	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
cis-1,2-Dichloroethylene	ug/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
trans-1,2-Dichloroethylene	ug/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,2-Dichloropropane	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
cis-1,3-Dichloropropene	ug/L	0.5	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6125681
trans-1,3-Dichloropropene	ug/L	0.5	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6125681
Ethylbenzene	ug/L	0.5	0.21	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Ethylene Dibromide	ug/L	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Hexane	ug/L	5	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6125681
Methylene Chloride(Dichloromethane)	ug/L	5	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6125681
Methyl Ethyl Ketone (2-Butanone)	ug/L	400	<10	<10	<10	<10	<10	10	6125681
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 1: Full Depth Background Site Condition Standards									
Ground Water - All Types of Property Uses									

O.REG 153 VOCs BY HS & F1-F4 (WATER)

Maxxam ID			JUG804	JUG805	JUG806	JUG807	JUG808		
Sampling Date			2019/05/22 12:00	2019/05/22 14:00	2019/05/22	2019/05/22	2019/05/22		
COC Number			85831	85831	85831	85831	85831		
	UNITS	Criteria	BH19-12	BH19-15	DUP-E	BH19-18	BH19-17	RDL	QC Batch
Methyl Isobutyl Ketone	ug/L	640	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	6125681
Methyl t-butyl ether (MTBE)	ug/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Styrene	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,1,1,2-Tetrachloroethane	ug/L	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Tetrachloroethylene	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Toluene	ug/L	0.8	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
1,1,1-Trichloroethane	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
1,1,2-Trichloroethane	ug/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Trichloroethylene	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
Trichlorofluoromethane (FREON 11)	ug/L	150	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6125681
Vinyl Chloride	ug/L	0.5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6125681
p+m-Xylene	ug/L	-	1.9	<0.20	1.6	<0.20	<0.20	0.20	6125681
o-Xylene	ug/L	-	1.8	<0.20	1.5	<0.20	<0.20	0.20	6125681
Total Xylenes	ug/L	72	3.7	<0.20	3.1	<0.20	<0.20	0.20	6125681
F1 (C6-C10)	ug/L	420	<25	<25	<25	<25	<25	25	6125681
F1 (C6-C10) - BTEX	ug/L	420	<25	<25	<25	<25	<25	25	6125681
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	ug/L	150	<100	<100	<100	<100	<100	100	6142810
F3 (C16-C34 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	<200	200	6142810
F4 (C34-C50 Hydrocarbons)	ug/L	500	<200	<200	<200	<200	<200	200	6142810
Reached Baseline at C50	ug/L	-	Yes	Yes	Yes	Yes	Yes		6142810
Surrogate Recovery (%)									
o-Terphenyl	%	-	112	101	100	101	103		6142810
4-Bromofluorobenzene	%	-	94	93	93	93	92		6125681
D4-1,2-Dichloroethane	%	-	110	110	113	113	113		6125681
D8-Toluene	%	-	98	98	97	98	98		6125681
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)									
Table 1: Full Depth Background Site Condition Standards									
Ground Water - All Types of Property Uses									

O.REG 153 VOCs BY HS (WATER)

Maxxam ID			JUG809		
Sampling Date			2019/05/22		
COC Number			85831		
	UNITS	Criteria	TRIP BLANK	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	0.5	<0.50	0.50	6136767
Volatile Organics					
Acetone (2-Propanone)	ug/L	2700	<10	10	6141009
Benzene	ug/L	0.5	<0.20	0.20	6141009
Bromodichloromethane	ug/L	2	<0.50	0.50	6141009
Bromoform	ug/L	5.0	<1.0	1.0	6141009
Bromomethane	ug/L	0.89	<0.50	0.50	6141009
Carbon Tetrachloride	ug/L	0.2	<0.20	0.20	6141009
Chlorobenzene	ug/L	0.5	<0.20	0.20	6141009
Chloroform	ug/L	2	<0.20	0.20	6141009
Dibromochloromethane	ug/L	2	<0.50	0.50	6141009
1,2-Dichlorobenzene	ug/L	0.5	<0.50	0.50	6141009
1,3-Dichlorobenzene	ug/L	0.5	<0.50	0.50	6141009
1,4-Dichlorobenzene	ug/L	0.5	<0.50	0.50	6141009
Dichlorodifluoromethane (FREON 12)	ug/L	590	<1.0	1.0	6141009
1,1-Dichloroethane	ug/L	0.5	<0.20	0.20	6141009
1,2-Dichloroethane	ug/L	0.5	<0.50	0.50	6141009
1,1-Dichloroethylene	ug/L	0.5	<0.20	0.20	6141009
cis-1,2-Dichloroethylene	ug/L	1.6	<0.50	0.50	6141009
trans-1,2-Dichloroethylene	ug/L	1.6	<0.50	0.50	6141009
1,2-Dichloropropane	ug/L	0.5	<0.20	0.20	6141009
cis-1,3-Dichloropropene	ug/L	0.5	<0.30	0.30	6141009
trans-1,3-Dichloropropene	ug/L	0.5	<0.40	0.40	6141009
Ethylbenzene	ug/L	0.5	<0.20	0.20	6141009
Ethylene Dibromide	ug/L	0.2	<0.20	0.20	6141009
Hexane	ug/L	5	<1.0	1.0	6141009
Methylene Chloride(Dichloromethane)	ug/L	5	<2.0	2.0	6141009
Methyl Ethyl Ketone (2-Butanone)	ug/L	400	<10	10	6141009
Methyl Isobutyl Ketone	ug/L	640	<5.0	5.0	6141009
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 1: Full Depth Background Site Condition Standards					
Ground Water - All Types of Property Uses					

O.REG 153 VOCs BY HS (WATER)

Maxxam ID			JUG809		
Sampling Date			2019/05/22		
COC Number			85831		
	UNITS	Criteria	TRIP BLANK	RDL	QC Batch
Methyl t-butyl ether (MTBE)	ug/L	15	<0.50	0.50	6141009
Styrene	ug/L	0.5	<0.50	0.50	6141009
1,1,1,2-Tetrachloroethane	ug/L	1.1	<0.50	0.50	6141009
1,1,2,2-Tetrachloroethane	ug/L	0.5	<0.50	0.50	6141009
Tetrachloroethylene	ug/L	0.5	<0.20	0.20	6141009
Toluene	ug/L	0.8	<0.20	0.20	6141009
1,1,1-Trichloroethane	ug/L	0.5	<0.20	0.20	6141009
1,1,2-Trichloroethane	ug/L	0.5	<0.50	0.50	6141009
Trichloroethylene	ug/L	0.5	<0.20	0.20	6141009
Trichlorofluoromethane (FREON 11)	ug/L	150	<0.50	0.50	6141009
Vinyl Chloride	ug/L	0.5	<0.20	0.20	6141009
p+m-Xylene	ug/L	-	<0.20	0.20	6141009
o-Xylene	ug/L	-	<0.20	0.20	6141009
Total Xylenes	ug/L	72	<0.20	0.20	6141009
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	-	82		6141009
D4-1,2-Dichloroethane	%	-	110		6141009
D8-Toluene	%	-	89		6141009
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)					
Table 1: Full Depth Background Site Condition Standards					
Ground Water - All Types of Property Uses					

TEST SUMMARY

Maxxam ID: JUG804
Sample ID: BH19-12
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6136767	N/A	2019/05/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	6138633	N/A	2019/05/27	Deonarine Ramnarine
Chromium (VI) in Water	IC	6131206	N/A	2019/05/27	Lang Le
Free (WAD) Cyanide	SKAL/CN	6141349	N/A	2019/05/26	Barbara Kalbasi Esfahani
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6142810	2019/05/27	2019/05/28	Prabhjot Gulati
Mercury	CV/AA	6140620	2019/05/25	2019/05/27	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6138969	N/A	2019/05/27	Thao Nguyen
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6125681	N/A	2019/05/25	Anna Gabrielyan

Maxxam ID: JUG804 Dup
Sample ID: BH19-12
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	SKAL/CN	6141349	N/A	2019/05/26	Barbara Kalbasi Esfahani

Maxxam ID: JUG805
Sample ID: BH19-15
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6136767	N/A	2019/05/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	6138669	N/A	2019/05/27	Deonarine Ramnarine
Chromium (VI) in Water	IC	6131206	N/A	2019/05/27	Lang Le
Free (WAD) Cyanide	SKAL/CN	6141349	N/A	2019/05/26	Barbara Kalbasi Esfahani
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6142810	2019/05/27	2019/05/28	Prabhjot Gulati
Mercury	CV/AA	6140620	2019/05/25	2019/05/27	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6138969	N/A	2019/05/27	Thao Nguyen
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6125681	N/A	2019/05/25	Anna Gabrielyan

Maxxam ID: JUG806
Sample ID: DUP-E
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6136767	N/A	2019/05/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	6138660	N/A	2019/05/27	Deonarine Ramnarine
Chromium (VI) in Water	IC	6131206	N/A	2019/05/27	Lang Le
Free (WAD) Cyanide	SKAL/CN	6141349	N/A	2019/05/26	Barbara Kalbasi Esfahani
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6142810	2019/05/27	2019/05/28	Prabhjot Gulati
Mercury	CV/AA	6140620	2019/05/25	2019/05/27	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6138969	N/A	2019/05/27	Thao Nguyen
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6125681	N/A	2019/05/25	Anna Gabrielyan

Maxxam Job #: B9D8114
Report Date: 2019/05/28

DS Consultants Limited
Client Project #: 18-692-100
Site Location: Derry-Britannia Lands, Ninth Line
Sampler Initials: GK

TEST SUMMARY

Maxxam ID: JUG807
Sample ID: BH19-18
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6136767	N/A	2019/05/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	6138669	N/A	2019/05/27	Deonarine Ramnarine
Chromium (VI) in Water	IC	6131206	N/A	2019/05/27	Lang Le
Free (WAD) Cyanide	SKAL/CN	6141349	N/A	2019/05/26	Barbara Kalbasi Esfahani
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6142810	2019/05/27	2019/05/28	Prabhjot Gulati
Mercury	CV/AA	6140620	2019/05/25	2019/05/27	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6138969	N/A	2019/05/27	Thao Nguyen
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6125681	N/A	2019/05/25	Anna Gabrielyan

Maxxam ID: JUG808
Sample ID: BH19-17
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6136767	N/A	2019/05/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	6138669	N/A	2019/05/27	Deonarine Ramnarine
Chromium (VI) in Water	IC	6131206	N/A	2019/05/27	Lang Le
Free (WAD) Cyanide	SKAL/CN	6141349	N/A	2019/05/26	Barbara Kalbasi Esfahani
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6142810	2019/05/27	2019/05/28	Prabhjot Gulati
Mercury	CV/AA	6140620	2019/05/25	2019/05/27	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6138969	N/A	2019/05/27	Thao Nguyen
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6125681	N/A	2019/05/25	Anna Gabrielyan

Maxxam ID: JUG809
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2019/05/22
Shipped:
Received: 2019/05/23

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6136767	N/A	2019/05/28	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	6141009	N/A	2019/05/27	Juan Pangilinan

GENERAL COMMENTS

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

Package 1	5.0°C
Package 2	5.3°C

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

DS Consultants Limited
Client Project #: 18-692-100
Site Location: Derry-Brittania Lands, Ninth Line
Sampler Initials: GK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6125681	4-Bromofluorobenzene	2019/05/25	96	70 - 130	97	70 - 130	95	%		
6125681	D4-1,2-Dichloroethane	2019/05/25	110	70 - 130	107	70 - 130	107	%		
6125681	D8-Toluene	2019/05/25	101	70 - 130	101	70 - 130	99	%		
6141009	4-Bromofluorobenzene	2019/05/27	114	70 - 130	118	70 - 130	108	%		
6141009	D4-1,2-Dichloroethane	2019/05/27	102	70 - 130	97	70 - 130	107	%		
6141009	D8-Toluene	2019/05/27	105	70 - 130	107	70 - 130	89	%		
6142810	o-Terphenyl	2019/05/27	111	60 - 130	116	60 - 130	110	%		
6125681	1,1,1,2-Tetrachloroethane	2019/05/25	104	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
6125681	1,1,1-Trichloroethane	2019/05/25	104	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
6125681	1,1,2,2-Tetrachloroethane	2019/05/25	108	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
6125681	1,1,2-Trichloroethane	2019/05/25	113	70 - 130	111	70 - 130	<0.50	ug/L	NC	30
6125681	1,1-Dichloroethane	2019/05/25	102	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6125681	1,1-Dichloroethylene	2019/05/25	99	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
6125681	1,2-Dichlorobenzene	2019/05/25	106	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
6125681	1,2-Dichloroethane	2019/05/25	109	70 - 130	108	70 - 130	<0.50	ug/L	NC	30
6125681	1,2-Dichloropropane	2019/05/25	102	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6125681	1,3-Dichlorobenzene	2019/05/25	107	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
6125681	1,4-Dichlorobenzene	2019/05/25	107	70 - 130	105	70 - 130	<0.50	ug/L	NC	30
6125681	Acetone (2-Propanone)	2019/05/25	99	60 - 140	94	60 - 140	<10	ug/L	0.020	30
6125681	Benzene	2019/05/25	101	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6125681	Bromodichloromethane	2019/05/25	97	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
6125681	Bromoform	2019/05/25	101	70 - 130	98	70 - 130	<1.0	ug/L	NC	30
6125681	Bromomethane	2019/05/25	107	60 - 140	104	60 - 140	<0.50	ug/L	NC	30
6125681	Carbon Tetrachloride	2019/05/25	103	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
6125681	Chlorobenzene	2019/05/25	101	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
6125681	Chloroform	2019/05/25	106	70 - 130	107	70 - 130	<0.20	ug/L	NC	30
6125681	cis-1,2-Dichloroethylene	2019/05/25	102	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
6125681	cis-1,3-Dichloropropene	2019/05/25	101	70 - 130	98	70 - 130	<0.30	ug/L	NC	30
6125681	Dibromochloromethane	2019/05/25	102	70 - 130	101	70 - 130	<0.50	ug/L	NC	30
6125681	Dichlorodifluoromethane (FREON 12)	2019/05/25	109	60 - 140	108	60 - 140	<1.0	ug/L	NC	30
6125681	Ethylbenzene	2019/05/25	97	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
6125681	Ethylene Dibromide	2019/05/25	103	70 - 130	102	70 - 130	<0.20	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
Client Project #: 18-692-100
Site Location: Derry-Brittania Lands, Ninth Line
Sampler Initials: GK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6125681	F1 (C6-C10) - BTEX	2019/05/25					<25	ug/L	NC	30
6125681	F1 (C6-C10)	2019/05/25	94	60 - 140	96	60 - 140	<25	ug/L	NC	30
6125681	Hexane	2019/05/25	93	70 - 130	94	70 - 130	<1.0	ug/L	NC	30
6125681	Methyl Ethyl Ketone (2-Butanone)	2019/05/25	105	60 - 140	102	60 - 140	<10	ug/L	NC	30
6125681	Methyl Isobutyl Ketone	2019/05/25	106	70 - 130	104	70 - 130	<5.0	ug/L	NC	30
6125681	Methyl t-butyl ether (MTBE)	2019/05/25	95	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
6125681	Methylene Chloride(Dichloromethane)	2019/05/25	96	70 - 130	96	70 - 130	<2.0	ug/L	NC	30
6125681	o-Xylene	2019/05/25	95	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6125681	p+m-Xylene	2019/05/25	94	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6125681	Styrene	2019/05/25	91	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
6125681	Tetrachloroethylene	2019/05/25	101	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
6125681	Toluene	2019/05/25	92	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6125681	Total Xylenes	2019/05/25					<0.20	ug/L	NC	30
6125681	trans-1,2-Dichloroethylene	2019/05/25	102	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
6125681	trans-1,3-Dichloropropene	2019/05/25	103	70 - 130	96	70 - 130	<0.40	ug/L	NC	30
6125681	Trichloroethylene	2019/05/25	102	70 - 130	105	70 - 130	<0.20	ug/L	NC	30
6125681	Trichlorofluoromethane (FREON 11)	2019/05/25	107	70 - 130	109	70 - 130	<0.50	ug/L	NC	30
6125681	Vinyl Chloride	2019/05/25	98	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
6131206	Chromium (VI)	2019/05/27	NC	80 - 120	101	80 - 120	<0.50	ug/L	0.28	20
6138633	Dissolved Chloride (Cl-)	2019/05/27	NC	80 - 120	103	80 - 120	<1.0	mg/L	1.7	20
6138660	Dissolved Chloride (Cl-)	2019/05/27	117	80 - 120	103	80 - 120	<1.0	mg/L	0.12	20
6138669	Dissolved Chloride (Cl-)	2019/05/27	107	80 - 120	104	80 - 120	<1.0	mg/L	0.66	20
6138969	Dissolved Antimony (Sb)	2019/05/27	104	80 - 120	98	80 - 120	<0.50	ug/L	NC	20
6138969	Dissolved Arsenic (As)	2019/05/27	104	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
6138969	Dissolved Barium (Ba)	2019/05/27	102	80 - 120	99	80 - 120	<2.0	ug/L	0.95	20
6138969	Dissolved Beryllium (Be)	2019/05/27	104	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
6138969	Dissolved Boron (B)	2019/05/27	103	80 - 120	102	80 - 120	<10	ug/L	0.75	20
6138969	Dissolved Cadmium (Cd)	2019/05/27	106	80 - 120	100	80 - 120	<0.10	ug/L	NC	20
6138969	Dissolved Chromium (Cr)	2019/05/27	104	80 - 120	102	80 - 120	<5.0	ug/L	NC	20
6138969	Dissolved Cobalt (Co)	2019/05/27	102	80 - 120	102	80 - 120	<0.50	ug/L	3.4	20
6138969	Dissolved Copper (Cu)	2019/05/27	104	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
6138969	Dissolved Lead (Pb)	2019/05/27	100	80 - 120	98	80 - 120	<0.50	ug/L	NC	20

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
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QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6138969	Dissolved Molybdenum (Mo)	2019/05/27	110	80 - 120	103	80 - 120	<0.50	ug/L	4.1	20
6138969	Dissolved Nickel (Ni)	2019/05/27	100	80 - 120	100	80 - 120	<1.0	ug/L	0.50	20
6138969	Dissolved Selenium (Se)	2019/05/27	105	80 - 120	102	80 - 120	<2.0	ug/L	NC	20
6138969	Dissolved Silver (Ag)	2019/05/27	96	80 - 120	100	80 - 120	<0.10	ug/L	NC	20
6138969	Dissolved Sodium (Na)	2019/05/27	NC	80 - 120	101	80 - 120	<100	ug/L	0.0036	20
6138969	Dissolved Thallium (Tl)	2019/05/27	101	80 - 120	99	80 - 120	<0.050	ug/L	NC	20
6138969	Dissolved Uranium (U)	2019/05/27	98	80 - 120	94	80 - 120	<0.10	ug/L	3.0	20
6138969	Dissolved Vanadium (V)	2019/05/27	106	80 - 120	102	80 - 120	<0.50	ug/L	NC	20
6138969	Dissolved Zinc (Zn)	2019/05/27	104	80 - 120	102	80 - 120	<5.0	ug/L	NC	20
6140620	Mercury (Hg)	2019/05/27	100	75 - 125	98	80 - 120	<0.1	ug/L	NC	20
6141009	1,1,1,2-Tetrachloroethane	2019/05/27	97	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
6141009	1,1,1-Trichloroethane	2019/05/27	95	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6141009	1,1,2,2-Tetrachloroethane	2019/05/27	104	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6141009	1,1,2-Trichloroethane	2019/05/27	101	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
6141009	1,1-Dichloroethane	2019/05/27	96	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6141009	1,1-Dichloroethylene	2019/05/27	94	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6141009	1,2-Dichlorobenzene	2019/05/27	100	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6141009	1,2-Dichloroethane	2019/05/27	101	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6141009	1,2-Dichloropropane	2019/05/27	101	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
6141009	1,3-Dichlorobenzene	2019/05/27	100	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6141009	1,4-Dichlorobenzene	2019/05/27	102	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
6141009	Acetone (2-Propanone)	2019/05/27	97	60 - 140	95	60 - 140	<10	ug/L	NC	30
6141009	Benzene	2019/05/27	97	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6141009	Bromodichloromethane	2019/05/27	98	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6141009	Bromoform	2019/05/27	98	70 - 130	97	70 - 130	<1.0	ug/L	NC	30
6141009	Bromomethane	2019/05/27	100	60 - 140	92	60 - 140	<0.50	ug/L	NC	30
6141009	Carbon Tetrachloride	2019/05/27	95	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6141009	Chlorobenzene	2019/05/27	97	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
6141009	Chloroform	2019/05/27	98	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6141009	cis-1,2-Dichloroethylene	2019/05/27	100	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
6141009	cis-1,3-Dichloropropene	2019/05/27	103	70 - 130	94	70 - 130	<0.30	ug/L	NC	30
6141009	Dibromochloromethane	2019/05/27	99	70 - 130	97	70 - 130	<0.50	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

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QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6141009	Dichlorodifluoromethane (FREON 12)	2019/05/27	100	60 - 140	99	60 - 140	<1.0	ug/L	NC	30
6141009	Ethylbenzene	2019/05/27	94	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
6141009	Ethylene Dibromide	2019/05/27	101	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6141009	Hexane	2019/05/27	104	70 - 130	106	70 - 130	<1.0	ug/L	NC	30
6141009	Methyl Ethyl Ketone (2-Butanone)	2019/05/27	107	60 - 140	104	60 - 140	<10	ug/L	NC	30
6141009	Methyl Isobutyl Ketone	2019/05/27	113	70 - 130	114	70 - 130	<5.0	ug/L	NC	30
6141009	Methyl t-butyl ether (MTBE)	2019/05/27	94	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6141009	Methylene Chloride(Dichloromethane)	2019/05/27	92	70 - 130	87	70 - 130	<2.0	ug/L	NC	30
6141009	o-Xylene	2019/05/27	91	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
6141009	p+m-Xylene	2019/05/27	78	70 - 130	87	70 - 130	<0.20	ug/L	NC	30
6141009	Styrene	2019/05/27	76	70 - 130	88	70 - 130	<0.50	ug/L	NC	30
6141009	Tetrachloroethylene	2019/05/27	95	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
6141009	Toluene	2019/05/27	101	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6141009	Total Xylenes	2019/05/27					<0.20	ug/L	NC	30
6141009	trans-1,2-Dichloroethylene	2019/05/27	97	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6141009	trans-1,3-Dichloropropene	2019/05/27	111	70 - 130	97	70 - 130	<0.40	ug/L	NC	30
6141009	Trichloroethylene	2019/05/27	96	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6141009	Trichlorofluoromethane (FREON 11)	2019/05/27	95	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6141009	Vinyl Chloride	2019/05/27	98	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6141349	WAD Cyanide (Free)	2019/05/26	95	80 - 120	101	80 - 120	<1	ug/L	NC	20
6142810	F2 (C10-C16 Hydrocarbons)	2019/05/28	NC	50 - 130	119	60 - 130	<100	ug/L	1.8	30
6142810	F3 (C16-C34 Hydrocarbons)	2019/05/28	120	50 - 130	138 (1)	60 - 130	<200	ug/L	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

DS Consultants Limited
Client Project #: 18-692-100
Site Location: Derry-Brittania Lands, Ninth Line
Sampler Initials: GK

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6142810	F4 (C34-C50 Hydrocarbons)	2019/05/28	130	50 - 130	139 (2)	60 - 130	<200	ug/L	NC	30

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 $\leq 2 \times$ RDL).

(1) The recovery of F3 in blank spike is outside the acceptance limits. However, the recovery of the other target compounds are within acceptable limits, and the recovery of F3 in matrix spike is within acceptable limits.

(2) The recovery of F4 in blank spike is outside the acceptance limits. However, the recovery of the other target compounds are within acceptable limits, and the recovery of F4 in matrix spike is within acceptable limits.

VALIDATION SIGNATURE PAGE

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



Anastassia Hamanov, Scientific Specialist

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

Exceedence Summary Table – Reg153/04 T1-GW
Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
BH19-15	JUG805-06	Dissolved Cobalt (Co)	3.8	4.3	0.50	ug/L
BH19-18	JUG807-03	Dissolved Chloride (Cl-)	790	1200	15	mg/L
BH19-18	JUG807-06	Dissolved Sodium (Na)	490000	510000	100	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.