

PHASE 2 INITIAL BOREHOLE DRILLING AND TESTING, SOUTH BRUCE

WP01: Site Decommissioning Report for SB_BH01

APM-REP-01332-0424

May 2023

Geofirma Engineering

nwmo

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MANAGEMENT
ORGANIZATION

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DES DÉCHETS
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Phase 2 Initial Borehole Drilling and Testing, South Bruce

WP01: Site Decommissioning Report for SB_BH01

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Prepared for:

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1 INTRODUCTION

The activities described in this report are one component of the geoscientific investigation that were completed by Geofirma as part of the NWMO Phase 2 Initial Borehole Drilling and Testing Program, in South Bruce, Ontario (Figure 1). Specifically, this report describes the activities undertaken to demobilize on-site infrastructure following drilling and testing activities at drill site SB_BH01. These activities were completed under the scope of work associated with Work Package 1 (WP01) (Site Construction and Infrastructure).

1.1 Background

The Initial Borehole Drilling and Testing project in South Bruce, Ontario is part of Phase 2 Geoscientific Preliminary Field Investigations of the NWMO's Adaptive Phased Management (APM) Site Selection Phase. This project involved the drilling and testing of two deep boreholes (SB_BH01 and SB_BH02) in the South Bruce area. The project was carried out by a team led by Geofirma Engineering Ltd. on behalf of the NWMO. The overall program is described in the Initial Borehole Characterization Plan (Geofirma 2020a).

Borehole SB_BH01 is located 3.5 km northwest of the community of Teeswater, Ontario (Figure 1) and was drilled through the entire sedimentary bedrock sequence to approximately 20 m into the Precambrian basement, to a total depth of 880.84 mBGS.

This report describes the decommissioning activities of temporary field facilities, temporary power and utilities, and perimeter fencing for borehole SB_BH01. Temporary field facilities included drill fluid containment system(s), field offices, washroom facilities, storage containers, portable generators, fuel tanks, lighting, and water tanks. Soil sampling to confirm soil quality and assess potential impacts on soil quality from the drill site activities at SB_BH01 is also described herein.

1.2 Objective

The purpose of this report is to provide a detailed description of activities completed by Geofirma for the decommissioning of infrastructure and confirmatory soil sampling following drilling and testing at SB_BH01.

1.3 Site History

1.3.1 Preliminary Site Visit

Staff from Geofirma and NWMO completed a site visit on June 3, 2020, to inspect potential drilling locations along Concession Road 8, near Teeswater Ontario. Based on findings from this visit, the NWMO selected the first borehole location (SB_BH01) at 1021 Concession Road 8, Teeswater, Ontario. The drill pad for SB_BH01 is located approximately 240 metres south of Concession Road 8 behind several pre-existing structures at the site.



LEGEND

- SB_BH01 Drill Site
- Municipality of South Bruce
- Municipality of Brockton
- Township of Huron-Kinloss
- Provincially Significant Wetland
- Wetland
- Waterbody
- Watercourse
- Major Road
- Local / Street
- OGSRL Well Locations

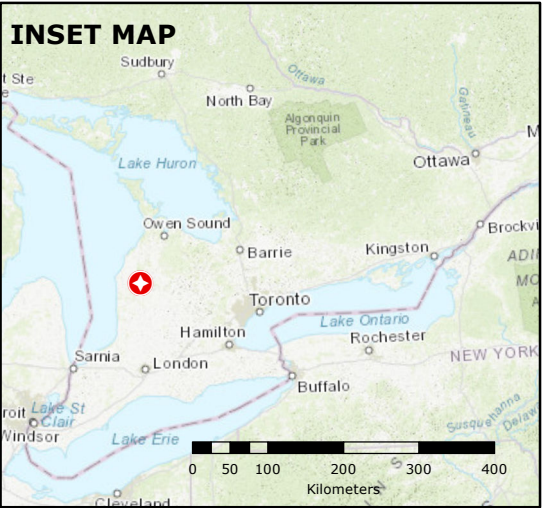
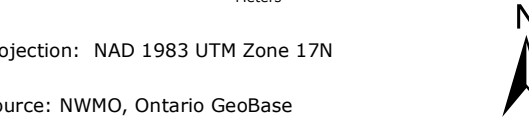
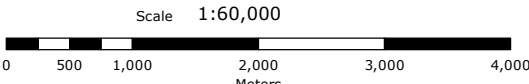


Figure 1
Location of SB_BH01 Drill Site



Projection: NAD 1983 UTM Zone 17N

Source: NWMO, Ontario GeoBase

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

PROJECT No. 20-211-1
NWMO South Bruce
Drilling and Testing

DESIGN: ADG
CAD/GIS: ADG
CHECK: SNS
REV: 0

DATE: 2021-01-27



1.3.2 Care and Control of SB_BH01 Drill Site

The NWMO transferred care and control of the SB_BH01 drill site to Geofirma on September 29, 2020 for approximately four days so that pre-construction baseline soil sampling could take place. The results of the baseline soil sampling are reported in a Baseline Soil Sampling Memo (Geofirma, 2021). The site was officially handed over to Geofirma on November 4, 2020 so that site construction activities could commence. The care and control area included the access road, proposed drill pad, and a construction facilitation area along the edge of both the road and the pad. Upon completion of site construction, care and control of the site access road and construction facilitation area was returned to NWMO on March 31, 2021. The drill pad remained in Geofirma custody until December 9, 2022, when it was officially handed back to NWMO control. Custody of the southwest corner of the drill pad was temporarily segregated from the rest of the drill pad for the 3D seismic program from November 7 to December 31, 2021.

1.3.3 Site Construction

Prior to site construction, Geofirma completed a baseline soil sampling and topographic survey. An initial topographic survey of existing conditions was completed by GM BluePlan on July 30, 2020 to design the site access road, drill pad, and to prepare a tender package for the site construction work. The baseline soil sampling program was completed on September 29, 2020, to obtain a record of soil type and quality prior to site construction activities. Results from the baseline soil sampling program were provided to NWMO as a memorandum (Geofirma, 2021). The topographic survey data was also provided to NWMO as a data deliverable on November 9, 2021.

Construction of the access road and drill pad for SB_BH01 started on November 4, 2020. Cedarwell Excavating Ltd. was subcontracted by Geofirma to complete the construction with support from GM BluePlan for survey of construction grades and compaction testing. Construction of the SB_BH01 access road and drill pad was completed on December 9, 2020.

A separate report has been prepared by Geofirma that outlines the site construction activities completed as part of WP01 at SB_BH01 (Geofirma, 2022). Included in the site construction report are inspections completed during construction as well as details of the final as-built elevations and site conditions.

1.3.4 Timeline of Site Infrastructure Activities

- **June 03, 2020:** Site visit by NWMO and Geofirma at potential drill sites along Concession Rd 8
- **September 29, 2020:** Baseline soil sampling at SB_BH01, site visit for construction tender
- **November 04, 2020:** Start of site construction at SB_BH01
- **December 09, 2020:** End of site construction at SB_BH01
- **January 25-26, 2021:** Installation of electrical infrastructure at SB_BH01, ESA Inspection
- **April 01, 2021:** Start setup of onsite infrastructure at SB_BH01 for drilling and testing
- **April 23, 2021:** Site commissioning inspection completed for SB_BH01
- **December 09, 2022:** Site decommissioning and hand back for SB_BH01

2 DEMOBILIZATION AND DECOMMISSIONING ACTIVITIES

The following section describes the onsite infrastructure that was demobilized from the SB_BH01 site. The configuration of the SB_BH01 drill site is shown in Figure 2.

2.1 Security Perimeter Fencing

A 1.8 m (6ft) high panel fence was installed by Sunbelt Rentals around the perimeter of the SB_BH01 drill pad. The fence dimensions were 120 x 50 m to contain the entire drill pad. The fenced area was setup to contain the working areas for all subsequent drilling and testing activities. Additional fencing was set up in southwest corner of the drill pad to temporarily separate from the rest of the drill pad for 3D seismic program between November and December 2021. All fencing was removed from site by Sunbelt Rentals in July 2022.

2.2 Office Trailers

All office trailers were rented from Alantra Leasing Inc. (Alantra), a trailer rental company based out of Dorchester, Ontario. A total of five office trailers were setup at the site; two outfitted as office space for Geofirma, NWMO, and observers from the Saugeen Ojibway Nation (SON), and three to support technical work activities, including core processing, laboratory and general storage and staging. Alantra transferred three trailers to the SB_BH02 drill site in October 2021, removed one trailer from site in February 2022, and the final trailer in July 2022.

2.3 Additional Equipment Storage

A SeaCan storage unit rented from Battlefield Equipment Rentals (Battlefield) was setup onsite to house additional equipment, fridges and coolers. The SeaCan was removed from site by Battlefield in July 2022.

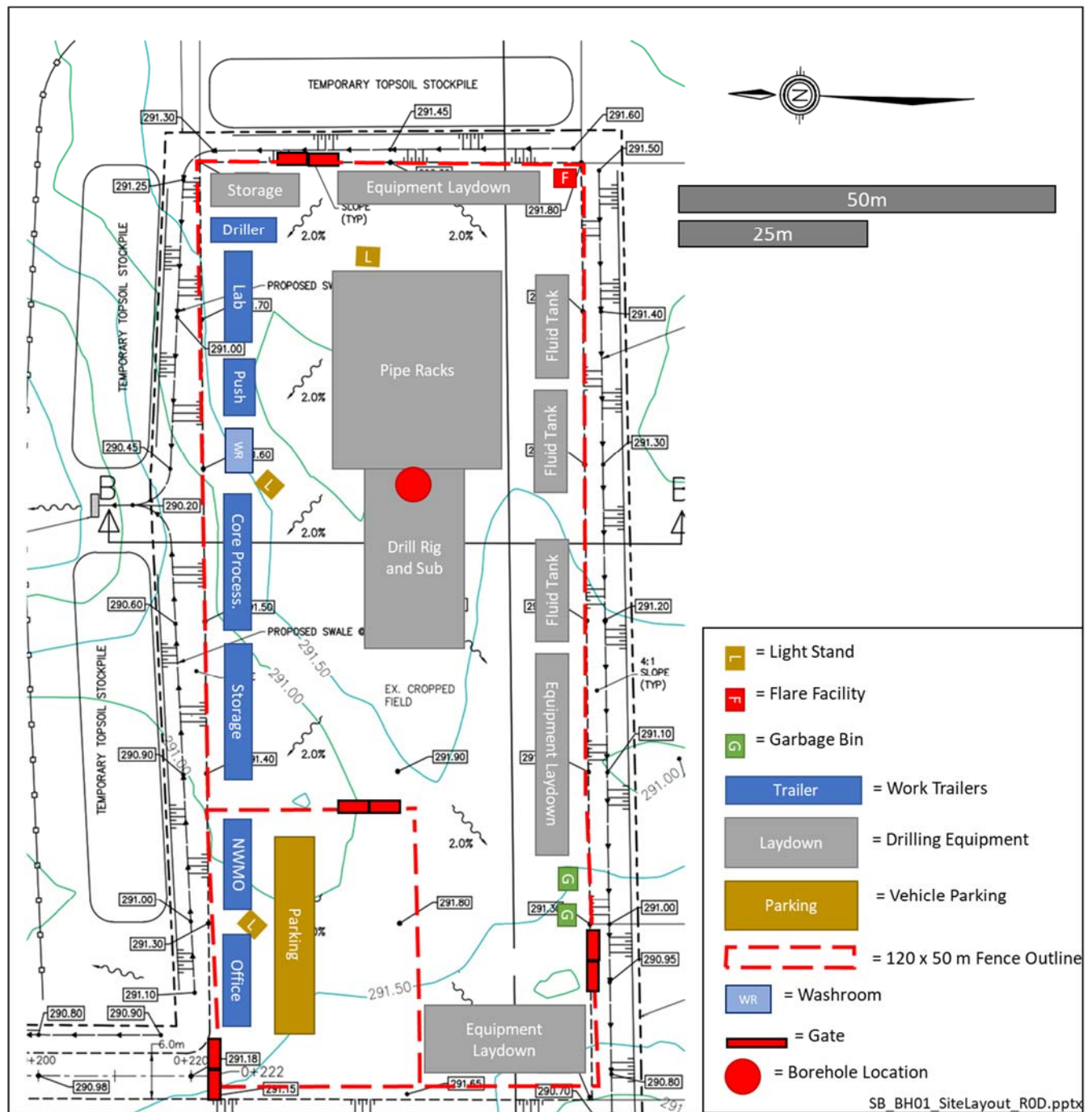
2.4 Potable Water Supply

Potable water for field staff was provided onsite by Culligan with service from Culligan's Hanover office. Rental water coolers were set up in the main office trailer, NWMO trailer, and core logging trailer. The rental water coolers were returned to Culligan prior to demobbing the site trailers.

2.5 Washrooms

A two-unit washroom trailer was rented from C & P Portable Toilets based in Teeswater, Ontario. The washroom trailer was temperature controlled and had two complete washrooms (toilet, faucet, etc.). The washroom trailer was removed by C & P Portables in July 2022.

Figure 2 SB_BH01 Drill Site Layout – Final Layout after Site Commissioning



2.6 Site Communication

Personal cellular phones were used as the primary method of communication and were used to communicate between the onsite field staff and support staff in Geofirma's Ottawa office. An additional "site supervisor" phone was purchased so that there was one consistent number for communication with site, regardless of which staff were onsite. The site phone remained active throughout the entirety of the project.

In the absence of local high-speed internet providers, internet connectivity at the site was enabled through use of Rogers Rocket Hub routers that connect cellular data. Three internet routers were setup in the following locations to ensure adequate internet connectivity across the site: Geofirma office trailer, NWMO office trailer, and the core logging trailer. The Rocket Hubs were transferred to the SB_BH02 drill site with trailers in October 2021. One Rocket Hub remained to provide internet connectivity on site until the final trailer was removed in July 2022.

2.7 Site Illumination

Onsite illumination was provided by portable light stands and lights affixed to the work trailers. Vital drilling provided a diesel-powered light stand to illuminate the work area around the drill rig. The Vital light stand was transferred to the SB_BH02 drill site in October 2021. The rest of the site was illuminated using three portable electricity-powered LED light stands, which were also transferred to the SB_BH02 drill site in October 2021. Additional LED light stands were used on site as required until July 2022.

2.8 Primary Power Supply

The primary source of power for the SB_BH01 drill site was electricity supplied by Hydro One. Hays Electric, a licensed electrical contractor based in Teeswater, Ontario was subcontracted by Geofirma to design and install the electrical infrastructure for the site. Hays Electric completed initial work associated with the electrical hook-up in January 2021. Hydro poles were installed along the access road from the existing house on the property to the drill site. A meter was installed to separate power consumption for the work site from the existing infrastructure on the property (storage shed, house). The electrical panel and support infrastructure were left in place following the completion of activities on site. Geofirma transferred the Hydro One account to the NWMO in December 2022.

2.9 Onsite Generators and Fuel Storage

Whenever practically possible, Geofirma and Vital staff used extension cords to power equipment with electricity sourced from the primary site power supply (e.g. exterior outlets on trailers and main electrical panel): this minimized the use of portable generators, additional fuel consumption, and the potential for accidental fuel spills. However, some field activities required use of external diesel or gasoline powered generators. All gasoline or diesel-powered equipment was owned or rented by Geofirma and Vital and contained within portable spill berms when stored or in use. The majority of generators were transferred to the SB_BH02 drill site in October 2021. Additional portable generators were used on site as required until July 2022.

2.10 Fuel Storage, Spill Containment, and Spill Response Supplies

All fuel containers and gasoline/diesel powered equipment (including the drill rig) were setup within spill containment structures and protected from vehicular impact. The spill containment system under the drill rig was removed from site in October 2021, and from under the service rig supporting WP09 activities in July 2022. The majority of smaller berms were transferred to SB_BH02 drill site in October 2021.

2.11 Fuel Supply and Storage

Vital drilling purchased fuel from Edward Fuels in Teeswater, Ontario. The diesel was stored in a 500-gallon double walled storage tank, set upon a secondary containment berm. The tank and containment berm were transferred to the SB_BH02 drill site in October 2021.

2.12 Solid Waste

Solid waste onsite was stored in two large bins that were rented from Affordable Waste Disposal, based in Teeswater, Ontario. One bin was used to store garbage and the second bin was used to store recyclable cardboard and other paper products. The cardboard bin was transferred to SB_BH02 drill site in October 2021 and the garbage bin was removed from site in July 2022.

2.13 Water Storage

An 80,000-litre water storage tank was rented from Rain for Rent to support drilling activities on site. The tank was removed from site in November 2022. US Ecology subsequently provided two 30,000-litre water storage tanks to support WP06 and WP09 activities. The two smaller water storage tanks were removed from site by US Ecology in July 2022.

2.14 Drilling Equipment

The Vital drill rig and supporting WP02 equipment (half round tanks, pipe racks, storage trailer, rig substructure, air compressor, telehandler, storage tanks etc.) were transferred to the SB_BH02 drill site in October 2021. A workover rig and pipe rack used to support WP06 and WP09 activities was removed from site in July 2022.

3 CONFIRMATORY SOIL SAMPLING

3.1 Background and Scope of Work

Surficial soil sampling was conducted by Geofirma following the completion of site work and demobilization as an environmental due diligence measure to confirm soil quality at the SB_BH01 drill site.

3.2 Methodology

Soil sampling was completed by Geofirma field staff on October 31, 2022, within the drill site that was to be returned to NWMO custody. Samples were collected on the drill pad and one additional area (Sample Area 7) to the south of the drill pad was included as per NWMO request. The sample locations were selected to provide spatial coverage across the drill pad and in areas where activities of potential environmental concern took place. A composite sample comprised of soil mixed from three discrete sampling locations was submitted for analysis from each area. Sample locations are shown on Figure 3.

- **Sample Area 1:** Sample SB_BH01_SS22-01 was collected from the northwest parking area of the drill pad.
- **Sample Area 2:** Sample SB_BH01_SS22-02 was collected from the southwest laydown area of the drill pad.
- **Sample Area 3:** Sample SB_BH01_SS22-03 was collected from the northeast area of the drill pad, which was utilized as a laydown area.
- **Sample Area 4:** Sample SB_BH01_SS22-04 was collected from the central area of the pad where the drill rig was situated.
- **Sample Area 5:** Sample SB_BH01_SS22-05 was collected from an area south of the drill rig, where the half round tanks and SeaCans were positioned and brine mixing activities were completed.
- **Sample Area 6:** Sample SB_BH01_SS22-06 was collected from the southeast area of the drill pad, where a half round tank and drilling catwalk were positioned.
- **Sample Area 7:** Sample SB_BH01_SS22-07 was collected from a swale located to the south of the drill pad, where runoff from the drill site was observed.

Soil samples were collected using a hand-shovel and trowel. Disposable nitrile gloves and eye protection were worn by Geofirma staff while sampling. The sampling equipment was decontaminated using Alconox cleaning detergent and distilled water between the collection of each sample. Rinse water produced during decontamination was collected in buckets and disposed of offsite. All sample locations were recorded using a high precision GNSS Trimble Catalyst DA2 surveying receiver.

All soil samples were collected from the constructed surface to a depth of approximately 0.1 m below ground surface (0 - 0.1 mBGS). A total of three sub samples were collected from each designated

sample area to form a composite sample, therefore a total of 21 sub samples were collected to form seven composite samples. Samples for volatiles were collected directly into laboratory containers and not composited. Figure 3 shows all sub sample locations and sample areas.

3.3 Sample Submission and Laboratory Analysis

Samples were submitted to Paracel Laboratories Ltd. (Paracel), a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory, based in Ottawa, Ontario, using standard laboratory chain-of-custody procedures.

A total of seven composite soil samples were collected, one from each of the sample areas and submitted to Paracel for metals, inorganics (pH, conductivity, sodium absorption ratio), Petroleum Hydrocarbons (PHCs). One sample from each area was also submitted for Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) analysis.

3.4 Results

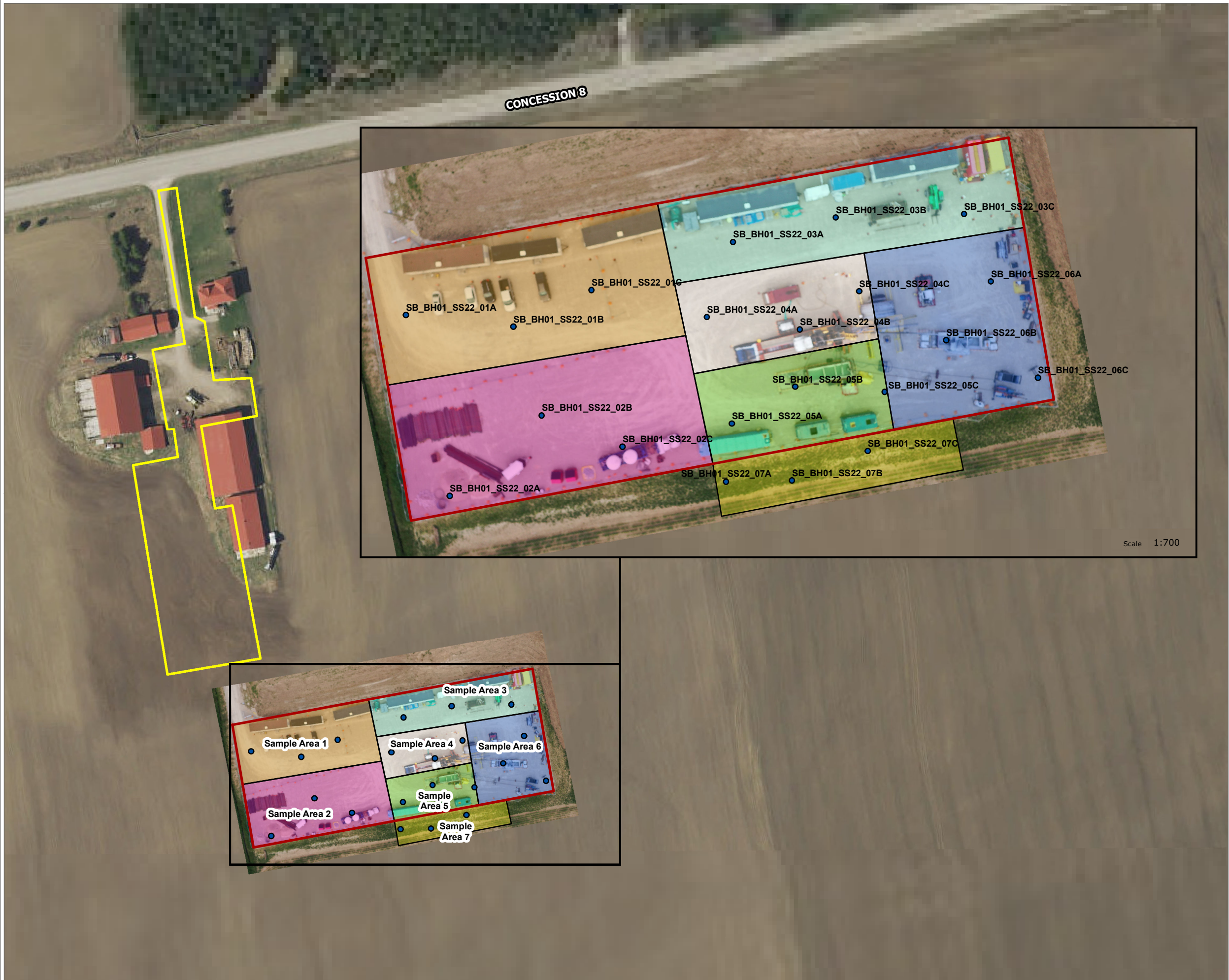
Soil quality results are summarized in Table B.1, Appendix B for metals, inorganics, PHCs and BTEX. All laboratory results are compared against Ontario Regulation (O.Reg.) 153/04 Table 2 for Full Depth Generic Site Condition Standards in a Potable Groundwater Condition, Residential Land-Use. Table 2 Agricultural Land-Use Standards have also been selected for comparison as sample SB_BH01_SS22-07 was collected in a swale south of the drill pad, yet this Standard is not considered applicable for samples of the granular material collected from within the drill pad.

All samples analysed were below applicable O.Reg. Table 2 Residential and Agricultural Land-Use Standards, and all PHCs and BTEX parameters were reported below laboratory detection limits. Complete laboratory reports are included in Appendix B

3.5 Conclusions

Geofirma completed a post-demobilization confirmatory soil sampling program at the SB_BH01 drill site as an environmental due diligence measure to confirm soil quality met applicable regulations. A total of seven samples were sent to an accredited laboratory for analysis of metals, inorganics (pH, conductivity, SAR), PHCs and BTEX.

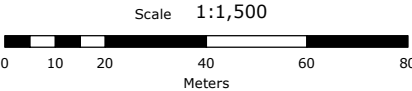
All soil samples collected and analysed met applicable Regulations, therefore drill site activities are deemed not to have negatively impacted the surficial soil on site.



LEGEND

- SB_BH01 Drill Pad
- Access Road Construction Area
- Sample Area 1
- Sample Area 2
- Sample Area 3
- Sample Area 4
- Sample Area 5
- Sample Area 6
- Sample Area 7
- SB_BH01 Post Construction Sample Location

Figure 3
SB_BH01
Soil Sampling Locations



Projection: NAD 1983 UTM Zone 17N
Source: NWMO, Ontario GeoBase
Service Layer Credits: NHIC air photo



PROJECT No. 20-211-1
SB_BH01 Handover
Soil Sampling Program

DESIGN: ADG
CAD/GIS: ADG
CHECK: TKG
REV: 0

DATE: 2023-04-18



4 SITE DECOMMISSIONING INSPECTION

Geofirma completed a detailed site inspection of the SB_BH01 drill site with NWMO personnel on December 9, 2022. The purpose of the site inspection was to confirm all equipment and infrastructure had been removed, and the site was clear of debris and general waste prior to Geofirma handover of the site to the NWMO. The demobilization and decommissioning activities were documented and a decommissioning checklist was signed off by the Geofirma Site Supervisor and WP01 Lead. A copy of the SB_BH01 site decommissioning checklist is provided in Appendix A.

5 REFERENCES

Geofirma Engineering Ltd., 2021. Baseline Soil Sampling at SB_BH01, NWMO Phase 2 Initial Borehole Drilling and Testing South Bruce. Memorandum Rev 0. February 17.

Geofirma Engineering Ltd., 2022. WP01: Site Construction Report for SB_BH01. – Phase 2 Initial Borehole Drilling and Testing, South Bruce. Revision 0. September 23.

20-211-WP01

SB_BH01 Site Decommissioning Report

Appendix A


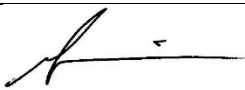
Site Decommissioning Checklist

WP01 Site Decommissioning Checklist – NWMO South Bruce Drilling and Testing

Drill Site: SB BH01 Date: 9-Dec-22

Item/Description	Item Completion Sign-Off		N/A
	Geofirma Site Supervisor	Geofirma WP01 Lead	
Completion of Drilling and Testing Activities			
WP02 (drilling and coring) through WP09 (Instrumentation) field activities complete	✓	✓	
Borehole XYZ survey complete	✓	✓	
Site Handover Agreement			
Site handover agreement signed by Geofirma and NWMO, returning care and control of the site back to the NMWO	✓	✓	
Access Road and Drill Site			
Access road and drill site left in acceptable condition for future NWMO use	✓	✓	
All roadways free of equipment, powerlines or debris that could be hazardous for vehicle and foot traffic	✓	✓	
Drill site returned to pre-construction conditions, as required. Including: removal of road surface and granular material, replacement of topsoil and regrading			✓
NWMO Equipment and Sample Storage			
NWMO owned equipment returned to NWMO core storage facility	✓	✓	
Completed core boxes transported to NWMO core storage facility	✓	✓	
Archive core samples transported to NWMO core storage facility (according to WP03 test plan requirements)	✓	✓	
Archive drill water and groundwater samples transported to NWMO core storage facility (according to WP02 and WP07 test plan requirements)	✓	✓	
Site Infrastructure			
Trailers unhooked from electrical system and removed from site	✓	✓	
Water storage equipment removed from site	✓	✓	
Generators and light stands removed from site	✓	✓	
Washroom facilities removed from site	✓	✓	
Electrical supply disconnected and safely shut-off (or management/service transferred to NWMO)	✓	✓	
Waste Management			
Drill water properly disposed according to WP02 test plan	✓	✓	
Fresh water properly disposed according to WP02 test plan	✓	✓	
Fuel and fuel storage equipment removed from site	✓	✓	
Solid waste and recycling disposed at suitable waste management facility	✓	✓	
Waste storage containers (e.g. garbage bins) removed from site	✓	✓	
Post-Drilling and Testing Environmental Sampling			
Water well (groundwater) sampling completed (as required)	✓	✓	
Soil sampling completed (as required)	✓	✓	

Comments	

Sign-Off				
Completed by Geofirma Site Supervisor:	Tim Galt		Date:	9-Dec-22
Approved by Geofirma WP01 Lead:	Glen Briscoe		Date:	9-Dec-22

20-211-WP01

SB_BH01 Site Decommissioning Report

Appendix B

Analytical Results and Laboratory Certificate of Analysis

SB_BH01 Analytical Soil Results

Parameter	Units	MDL	Reg 153/04 (2011)- Table 2 Agricultural	Reg 153/04 (2011)- Table 2 Residential	Sample						
					SB_BH01_SS 22-01	SB_BH01_SS 22-02	SB_BH01_SS 22-03	SB_BH01_SS 22-04	SB_BH01_SS 22-05	SB_BH01_SS 22-06	SB_BH01_SS 22-07
Sample Date (m/d/y)					31-Oct-22	31-Oct-22	31-Oct-22	31-Oct-22	31-Oct-22	31-Oct-22	31-Oct-22
Metals											
SAR	N/A	0.01	5 N/A	5 N/A	0.47	0.08	0.11	0.5	0.19	0.24	0.16
Antimony	ug/g dry	1.0	7.5 ug/g dry	7.5 ug/g dry	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	ug/g dry	1.0	11 ug/g dry	18 ug/g dry	2	2.1	2	2.1	1.8	2.1	4.7
Barium	ug/g dry	1.0	390 ug/g dry	390 ug/g dry	14.4	15.8	14.3	14.2	10.9	14.6	49.8
Beryllium	ug/g dry	0.5	4 ug/g dry	4 ug/g dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Boron	ug/g dry	5.0	120 ug/g dry	120 ug/g dry	9.5	9.4	8.7	8.9	7.6	9.2	9.5
Boron, available	ug/g dry	0.5	1.5 ug/g dry	1.5 ug/g dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	ug/g dry	0.5	1 ug/g dry	1.2 ug/g dry	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (VI)	ug/g dry	0.2	8 ug/g dry	8 ug/g dry	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	ug/g dry	5.0	160 ug/g dry	160 ug/g dry	8.2	8.9	8.3	8.9	7.3	9.2	19.5
Cobalt	ug/g dry	1.0	22 ug/g dry	22 ug/g dry	2.6	2.8	2.7	2.8	2.4	2.9	5.6
Conductivity	uS/cm	5	700 uS/cm	700 uS/cm	119	90	85	126	356	92	193
Copper	ug/g dry	5.0	140 ug/g dry	140 ug/g dry	6.7	7.4	7.3	7.7	6.9	10.3	10.1
Lead	ug/g dry	1.0	45 ug/g dry	120 ug/g dry	3.4	3.7	4.6	4.7	4.1	6	10.5
Mercury	ug/g dry	0.1	0.25 ug/g dry	0.27 ug/g dry	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/g dry	1.0	6.9 ug/g dry	6.9 ug/g dry	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/g dry	5.0	100 ug/g dry	100 ug/g dry	6.5	7.3	6.6	7.1	6	7.1	12.8
pH	pH units	0.05	NV	NV	7.7	7.71	7.78	7.83	7.86	7.86	7.73
Selenium	ug/g dry	1.0	2.4 ug/g dry	2.4 ug/g dry	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/g dry	0.3	20 ug/g dry	20 ug/g dry	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	<0.3
Thallium	ug/g dry	1.0	1 ug/g dry	1 ug/g dry	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	23 ug/g dry	23 ug/g dry	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/g dry	10.0	86 ug/g dry	86 ug/g dry	12	12.7	11.9	12.3	10.9	13	30.4
Zinc	ug/g dry	20.0	340 ug/g dry	340 ug/g dry	<20.0	<20.0	<20.0	<20.0	<20.0	<20.0	49.7
Volatiles											
Benzene	ug/g dry	0.02	0.21 ug/g dry	0.21 ug/g dry	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g dry	0.05	1.1 ug/g dry	1.1 ug/g dry	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	ug/g dry	0.05	2.3 ug/g dry	2.3 ug/g dry	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m/p-Xylene	ug/g dry	0.05	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	ug/g dry	0.05	NV	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylenes, total	ug/g dry	0.05	3.1 ug/g dry	3.1 ug/g dry	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hydrocarbons											
F1 PHCs (C6-C10)	ug/g dry	7	55 ug/g dry	55 ug/g dry	<7	<7	<7	<7	<7	<7	<7
F2 PHCs (C10-C16)	ug/g dry	4	98 ug/g dry	98 ug/g dry	<4	<4	<4	<4	<4	<4	<4
F3 PHCs (C16-C34)	ug/g dry	8	300 ug/g dry	300 ug/g dry	<8	<8	<8	<8	<8	<8	<8
F4 PHCs (C34-C50)	ug/g dry	6	2800 ug/g dry	2800 ug/g dry	<6	<6	<6	<6	<6	<6	<6

Notes:

1. Bold font indicates parameter concentration exceeds applicable agricultural criteria.
2. Highlight indicates parameter concentration exceeds applicable residential criteria.
3. NV = No Value
4. -- = Parameter not analysed

Certificate of Analysis

Geofirma Engineering Ltd.

1 Raymond St, Suite 200
Ottawa, ON K1R 1A2
Attn: Tim Galt

Client PO: 202111-013
Project: 20-211-1
Custody:

Report Date: 9-Nov-2022
Order Date: 3-Nov-2022

Order #: 2245365

This Certificate of Analysis contains analytical data applicable to the following samples as submitted :

Paracel ID	Client ID
2245365-01	SB_BH01_SS22-01
2245365-02	SB_BH01_SS22-02
2245365-03	SB_BH01_SS22-03
2245365-04	SB_BH01_SS22-04
2245365-05	SB_BH01_SS22-05
2245365-06	SB_BH01_SS22-06
2245365-07	SB_BH01_SS22-07
2245365-08	SB_BH02_SS22-01
2245365-09	SB_BH02_SS22-02
2245365-10	SB_BH02_SS22-03
2245365-11	SB_BH02_SS22-04
2245365-12	SB_BH02_SS22-05

Approved By:



Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: Geofirma Engineering Ltd.

Client PO: 202111-013

Report Date: 09-Nov-2022

Order Date: 3-Nov-2022

Project Description: 20-211-1

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	7-Nov-22	7-Nov-22
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	4-Nov-22	6-Nov-22
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	4-Nov-22	9-Nov-22
Conductivity	MOE E3138 - probe @25 °C, water ext	7-Nov-22	8-Nov-22
Mercury by CVAA	EPA 7471B - CVAA, digestion	7-Nov-22	7-Nov-22
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	4-Nov-22	4-Nov-22
PHC F1	CWS Tier 1 - P&T GC-FID	4-Nov-22	6-Nov-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	4-Nov-22	5-Nov-22
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	7-Nov-22	7-Nov-22
SAR	Calculated	7-Nov-22	8-Nov-22
Solids, %	CWS Tier 1 - Gravimetric	4-Nov-22	7-Nov-22

Certificate of Analysis
 Client: Geofirma Engineering Ltd.
 Client PO: 202111-013

Report Date: 09-Nov-2022
 Order Date: 3-Nov-2022
 Project Description: 20-211-1

	Client ID:	SB_BH01_SS22-01	SB_BH01_SS22-02	SB_BH01_SS22-03	SB_BH01_SS22-04
	Sample Date:	31-Oct-22 11:15	31-Oct-22 11:10	31-Oct-22 11:25	31-Oct-22 12:30
	Sample ID:	2245365-01	2245365-02	2245365-03	2245365-04
	MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	95.4	94.6	93.6	94.5
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General Inorganics

SAR	0.01 N/A	0.47	0.08	0.11	0.50
Conductivity	5 uS/cm	119	90	85	126
pH	0.05 pH Units	7.70	7.71	7.78	7.83

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.0	2.1	2.0	2.1
Barium	1.0 ug/g dry	14.4	15.8	14.3	14.2
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	9.5	9.4	8.7	8.9
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	8.2	8.9	8.3	8.9
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	2.6	2.8	2.7	2.8
Copper	5.0 ug/g dry	6.7	7.4	7.3	7.7
Lead	1.0 ug/g dry	3.4	3.7	4.6	4.7
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	6.5	7.3	6.6	7.1
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	12.0	12.7	11.9	12.3
Zinc	20.0 ug/g dry	<20.0	<20.0	<20.0	<20.0

Volatiles

Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	109%	107%	111%	105%

Certificate of Analysis

Report Date: 09-Nov-2022

Client: Geofirma Engineering Ltd.

Order Date: 3-Nov-2022

Client PO: 202111-013

Project Description: 20-211-1

	Client ID:	SB_BH01_SS22-01	SB_BH01_SS22-02	SB_BH01_SS22-03	SB_BH01_SS22-04
	Sample Date:	31-Oct-22 11:15	31-Oct-22 11:10	31-Oct-22 11:25	31-Oct-22 12:30
	Sample ID:	2245365-01	2245365-02	2245365-03	2245365-04
	MDL/Units	Soil	Soil	Soil	Soil

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Certificate of Analysis
 Client: Geofirma Engineering Ltd.
 Client PO: 202111-013

Report Date: 09-Nov-2022
 Order Date: 3-Nov-2022
 Project Description: 20-211-1

	Client ID:	SB_BH01_SS22-05	SB_BH01_SS22-06	SB_BH01_SS22-07	SB_BH02_SS22-01
	Sample Date:	31-Oct-22 12:27	31-Oct-22 11:30	31-Oct-22 12:20	31-Oct-22 09:15
	Sample ID:	2245365-05	2245365-06	2245365-07	2245365-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	94.1	93.9	84.8	95.2
General Inorganics					
SAR	0.01 N/A	0.19	0.24	0.16	1.62
Conductivity	5 uS/cm	356	92	193	278
pH	0.05 pH Units	7.86	7.86	7.73	7.90
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	1.8	2.1	4.7	2.2
Barium	1.0 ug/g dry	10.9	14.6	49.8	17.1
Beryllium	0.5 ug/g dry	<0.5	<0.5	0.6	<0.5
Boron	5.0 ug/g dry	7.6	9.2	9.5	10.0
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	7.3	9.2	19.5	9.0
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	2.4	2.9	5.6	2.7
Copper	5.0 ug/g dry	6.9	10.3	10.1	6.5
Lead	1.0 ug/g dry	4.1	6.0	10.5	4.1
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	6.0	7.1	12.8	6.6
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	0.4	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	10.9	13.0	30.4	13.1
Zinc	20.0 ug/g dry	<20.0	<20.0	49.7	<20.0
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	106%	107%	109%	104%

Certificate of Analysis

Report Date: 09-Nov-2022

Client: Geofirma Engineering Ltd.

Order Date: 3-Nov-2022

Client PO: 202111-013

Project Description: 20-211-1

Client ID:	SB_BH01_SS22-05	SB_BH01_SS22-06	SB_BH01_SS22-07	SB_BH02_SS22-01
Sample Date:	31-Oct-22 12:27	31-Oct-22 11:30	31-Oct-22 12:20	31-Oct-22 09:15
Sample ID:	2245365-05	2245365-06	2245365-07	2245365-08
MDL/Units	Soil	Soil	Soil	Soil

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	<6

Certificate of Analysis
 Client: Geofirma Engineering Ltd.
 Client PO: 202111-013

Report Date: 09-Nov-2022
 Order Date: 3-Nov-2022
 Project Description: 20-211-1

Client ID:	SB_BH02_SS22-02	SB_BH02_SS22-03	SB_BH02_SS22-04	SB_BH02_SS22-05
Sample Date:	31-Oct-22 09:30	31-Oct-22 09:08	31-Oct-22 08:57	31-Oct-22 08:49
Sample ID:	2245365-09	2245365-10	2245365-11	2245365-12
MDL/Units	Soil	Soil	Soil	Soil

Physical Characteristics

% Solids	0.1 % by Wt.	94.9	94.0	94.8	94.6
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General Inorganics

SAR	0.01 N/A	1.02	1.61	1.62	0.18
Conductivity	5 uS/cm	189	336	299	92
pH	0.05 pH Units	7.78	7.93	7.91	7.91

Metals

Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.3	2.5	2.3	2.5
Barium	1.0 ug/g dry	17.8	21.3	15.5	23.4
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Boron	5.0 ug/g dry	10.6	11.6	9.2	11.8
Boron, available	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	9.9	30.1	10.2	14.0
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	3.1	3.5	2.9	4.1
Copper	5.0 ug/g dry	8.0	15.7	8.9	21.4
Lead	1.0 ug/g dry	4.4	44.2	7.7	24.4
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	7.8	15.9	7.8	10.7
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	0.5	0.8
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	13.3	14.0	12.4	15.5
Zinc	20.0 ug/g dry	<20.0	56.5	21.3	31.1

Volatiles

Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene-d8	Surrogate	107%	105%	106%	107%

Certificate of Analysis

Report Date: 09-Nov-2022

Client: Geofirma Engineering Ltd.

Order Date: 3-Nov-2022

Client PO: 202111-013

Project Description: 20-211-1

Client ID:	SB_BH02_SS22-02	SB_BH02_SS22-03	SB_BH02_SS22-04	SB_BH02_SS22-05
Sample Date:	31-Oct-22 09:30	31-Oct-22 09:08	31-Oct-22 08:57	31-Oct-22 08:49
Sample ID:	2245365-09	2245365-10	2245365-11	2245365-12
MDL/Units	Soil	Soil	Soil	Soil

Hydrocarbons

F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<4
F3 PHCs (C16-C34)	8 ug/g dry	<8	30	44	<8
F4 PHCs (C34-C50)	6 ug/g dry	<6	13	33	<6

Certificate of Analysis

Report Date: 09-Nov-2022

Client: Geofirma Engineering Ltd.

Order Date: 3-Nov-2022

Client PO: 202111-013

Project Description: 20-211-1

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Conductivity	ND	5	uS/cm						
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	8.79		ug/g		110	50-140			

Certificate of Analysis

Report Date: 09-Nov-2022

Client: Geofirma Engineering Ltd.

Order Date: 3-Nov-2022

Client PO: 202111-013

Project Description: 20-211-1

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	1.38	0.01	N/A	1.28			7.5	30	
Conductivity	433	5	uS/cm	447			3.2	5	
pH	7.73	0.05	pH Units	7.70			0.4	2.3	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	ND	8	ug/g	ND			NC	30	
F4 PHCs (C34-C50)	ND	6	ug/g	ND			NC	30	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	1.9	1.0	ug/g	2.0			4.0	30	
Barium	13.5	1.0	ug/g	14.4			6.2	30	
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron, available	ND	0.5	ug/g	ND			NC	35	
Boron	8.8	5.0	ug/g	9.5			7.2	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	7.9	5.0	ug/g	8.2			3.6	30	
Cobalt	2.4	1.0	ug/g	2.6			6.4	30	
Copper	6.9	5.0	ug/g	6.7			3.1	30	
Lead	3.1	1.0	ug/g	3.4			7.7	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	6.3	5.0	ug/g	6.5			3.1	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	11.6	10.0	ug/g	12.0			3.7	30	
Zinc	ND	20.0	ug/g	ND			NC	30	
Physical Characteristics									
% Solids	79.6	0.1	% by Wt.	80.8			1.5	25	
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	9.24		ug/g		109	50-140			

Certificate of Analysis

Report Date: 09-Nov-2022

Client: Geofirma Engineering Ltd.

Order Date: 3-Nov-2022

Client PO: 202111-013

Project Description: 20-211-1

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	192	7	ug/g	ND	96.1	80-120			
F2 PHCs (C10-C16)	98	4	ug/g	ND	106	60-140			
F3 PHCs (C16-C34)	233	8	ug/g	ND	103	60-140			
F4 PHCs (C34-C50)	168	6	ug/g	ND	118	60-140			
Metals									
Antimony	36.7	1.0	ug/g	ND	73.3	70-130			
Arsenic	46.5	1.0	ug/g	ND	91.4	70-130			
Barium	47.0	1.0	ug/g	5.8	82.4	70-130			
Beryllium	44.5	0.5	ug/g	ND	88.8	70-130			
Boron, available	3.63	0.5	ug/g	ND	72.7	70-122			
Boron	46.3	5.0	ug/g	ND	84.9	70-130			
Cadmium	40.7	0.5	ug/g	ND	81.3	70-130			
Chromium (VI)	4.5	0.2	ug/g	ND	86.0	70-130			
Chromium	52.5	5.0	ug/g	ND	98.4	70-130			
Cobalt	48.7	1.0	ug/g	1.0	95.3	70-130			
Copper	45.8	5.0	ug/g	ND	86.3	70-130			
Lead	41.5	1.0	ug/g	1.3	80.3	70-130			
Molybdenum	44.6	1.0	ug/g	ND	88.9	70-130			
Nickel	47.7	5.0	ug/g	ND	90.3	70-130			
Selenium	41.6	1.0	ug/g	ND	82.9	70-130			
Silver	43.7	0.3	ug/g	ND	87.4	70-130			
Thallium	44.0	1.0	ug/g	ND	87.9	70-130			
Uranium	44.8	1.0	ug/g	ND	89.2	70-130			
Vanadium	55.2	10.0	ug/g	ND	101	70-130			
Zinc	46.0	20.0	ug/g	ND	81.0	70-130			
Volatiles									
Benzene	4.47	0.02	ug/g	ND	112	60-130			
Ethylbenzene	4.14	0.05	ug/g	ND	104	60-130			
Toluene	4.36	0.05	ug/g	ND	109	60-130			
m,p-Xylenes	8.51	0.05	ug/g	ND	106	60-130			
o-Xylene	4.22	0.05	ug/g	ND	106	60-130			
Surrogate: Toluene-d8	6.98		ug/g		87.2	50-140			

Certificate of Analysis

Client: Geofirma Engineering Ltd.

Client PO: 202111-013

Report Date: 09-Nov-2022

Order Date: 3-Nov-2022

Project Description: 20-211-1

Qualifier Notes:

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.
- When reported, data for F4G has been processed using a silica gel cleanup.



2245365

Client Name: Geofirma Engineering	Project Ref: 20-211-1	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular Date Required: _____
Contact Name: Tim Galt	Quote #:	
Address: 1 Raymond St Suite 200 Ottawa, ON K1R 1A2	PO #: 202111-013	
Telephone: 613-858-0169	E-mail: ssterling@geofirma.com, gbriscoe@geofirma.com tgalt@geofirma.com	

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)		Required Analysis													
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO	Sample Taken	Metals	PHCs F1-F4	BTEX	pH	Conductivity	SAR								
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA															
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm															
<input type="checkbox"/> Table _____ For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No		Mun: _____ <input type="checkbox"/> Other: _____																	
Sample ID/Location Name				Matrix	Air Volume	# of Containers	Date	Time											
1	SB_BH01_SS22-01			S		2	31-Oct-31	11:15	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
2	SB_BH01_SS22-02			S		2	31-Oct-31	11:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
3	SB_BH01_SS22-03			S		2	31-Oct-31	11:25	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
4	SB_BH01_SS22-04			S		2	31-Oct-31	12:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
5	SB_BH01_SS22-05			S		2	31-Oct-31	12:27	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
6	SB_BH01_SS22-06			S		2	31-Oct-31	11:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
7	SB_BH01_SS22-07			S		2	31-Oct-31	12:20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>					
8																			
9																			
10																			

Comments: Metals including B by HWE			Method of Delivery:	
Relinquished By (Sign): <i>Morgan de Kroon</i>	Received By Driver/Depot:	Received at Lab: <i>Scot</i>	Verified By: <i>WALKIN</i>	
Relinquished By (Print): Morgan de Kroon	Date/Time:	Date/Time: Nov 3/22 2:28pm	Date/Time: Nov 4/22 1054	
Date/Time: 03-Nov-22 / 11:30	Temperature: °C	Temperature: 6	pH Verified: <input type="checkbox"/> By:	



Parcel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
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Client Name: Geofirma Engineering	Project Ref: 20-211-1	Page 2 of 2
Contact Name: Tim Galt	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular Date Required: _____
Address: 1 Raymond St Suite 200 Ottawa, ON K1R 1A2	PO #: 202111-013	
Telephone: 613-858-0169	E-mail: ssterling@geofirma.com, gbriscoe@geofirma.com tgalt@geofirma.com	

Regulation 153/04		Other Regulation		Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)			Required Analysis																
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> REG 558	<input type="checkbox"/> PWQO	Matrix	Air Volume	# of Containers	Sample Taken	Metals	PHCs F1-F4	BTEX	pH	Conductivity	SAR									
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Coarse	<input type="checkbox"/> CCME	<input type="checkbox"/> MISA																			
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/Other		<input type="checkbox"/> SU - Sani	<input type="checkbox"/> SU - Storm																			
<input type="checkbox"/> Table _____ For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No				Mun: _____																			
Sample ID/Location Name																							
1	SB_BH02_SS22-01			S		2	31-Oct-31	9:15	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
2	SB_BH02_SS22-02			S		2	31-Oct-31	9:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
3	SB_BH02_SS22-03			S		2	31-Oct-31	9:08	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
4	SB_BH02_SS22-04			S		2	31-Oct-31	8:57	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
5	SB_BH02_SS22-05			S		2	31-Oct-31	8:49	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
6																							
7																							
8																							
9																							
10																							

Comments: Metals including B by HWE			Method of Delivery: <i>Walkin</i>		
Relinquished By (Sign): <i>Morgan de Kroon</i>	Received By Driver/Depot:	Received at Lab: <i>Sez</i>	Verified By: <i>Walkin</i>		
Relinquished By (Print): Morgan de Kroon	Date/Time:	Date/Time: <i>Nov 3/22 2:28p</i>	Date/Time: <i>Nov 4 2022 10:51</i>		
Date/Time: 03-Nov-22 / 11:30	Temperature: °C	Temperature: <i>6</i>	pH Verified: <input type="checkbox"/> By:		