PHASE 2 INITIAL BOREHOLE DRILLING AND TESTING, IGNACE AREA

WP01 Site Demobilization Report – Site Infrastructure for IG_BH02

APM-REP-01332-0264 **December 2020**

Golder Associates Ltd.

nwmo
NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Nuclear Waste Management Organization
22 St. Clair Avenue East, 4th Floor
Toronto, Ontario
M4T 2S3
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REPORT

PHASE 2 INITIAL BOREHOLE DRILLING AND TESTING, IGNACE AREA

WP01 Site Demobilization Report - Site Infrastructure for IG_BH02

Submitted to:

Nuclear Waste Management Organization
4th Floor 22 St. Clair Avenue East
Toronto, Ontario M4T 2S3

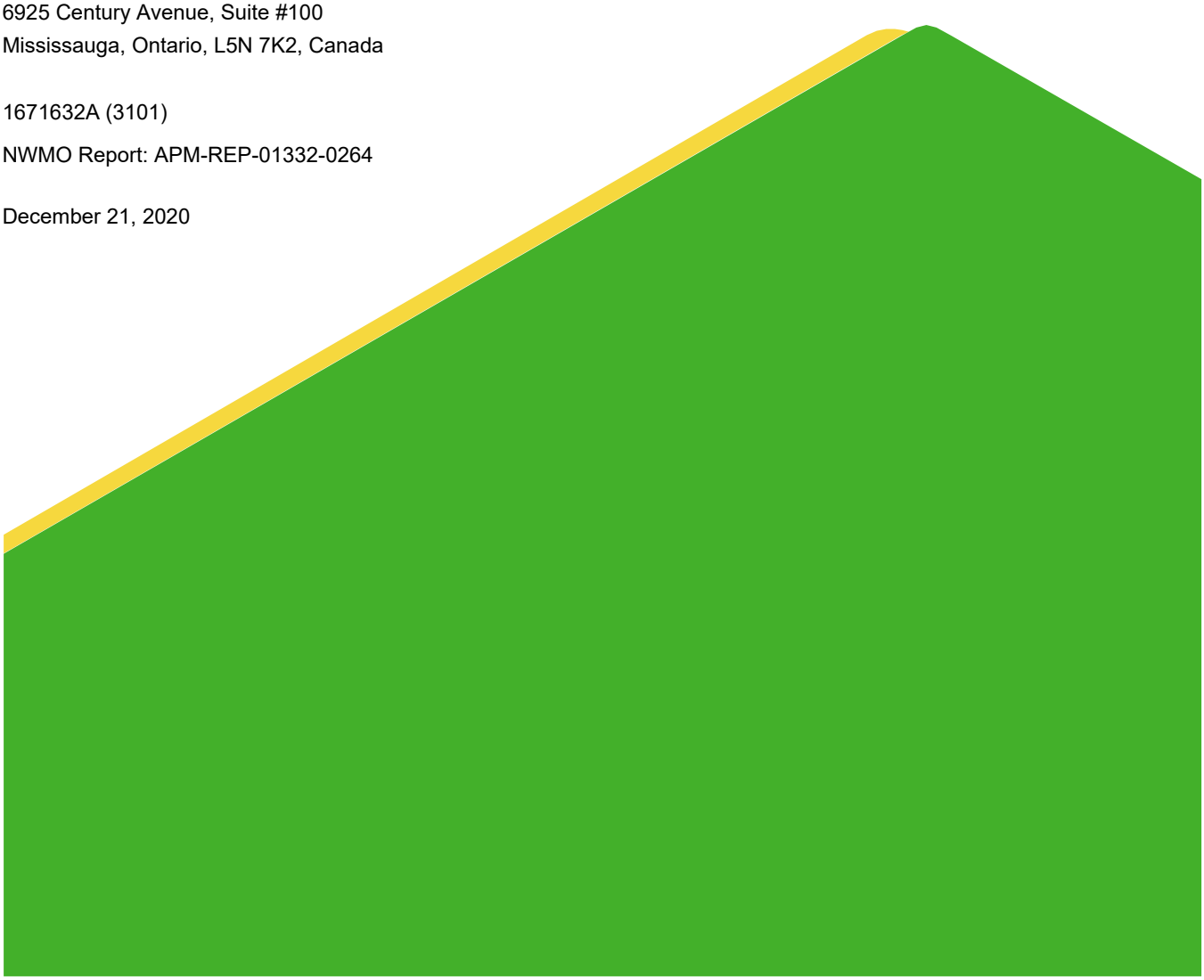
Submitted by:

Golder Associates Ltd.
6925 Century Avenue, Suite #100
Mississauga, Ontario, L5N 7K2, Canada

1671632A (3101)

NWMO Report: APM-REP-01332-0264

December 21, 2020



Distribution List

eCopy - NWMO

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WP01B SITE DEMOBILIZATION REPORT
SITE INFRASTRUCTURE FOR IG_BH02

CLIENT INFORMATION

Project Name: Phase 2 Initial Borehole Drilling and Testing, Ignace Area

Project Number: 1671632A

Client PO Number: 2000141

Document Name: 1671632A (3111) IG_BH02_WP1_Site_Demob_Rpt_21Dec2020_R1a

Client: Nuclear Waste Management Organization (NWMO)
22 St. Clair Avenue East, Fourth Floor
Toronto, Ontario
M4T 2S3

Client Contact:	Geoff Crann	Elise Leroux
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Issue/Revision Index

Issue Code	Revision					Revision Details
	No.	By	Rev'd.	App.	Date	
RR	0	ATK	GWS	JLC	December 2, 2020	Draft for review and comment
RI	1	ATK	GWS	JLC	December 21, 2020	Final released for information

Issue Codes: RR = Released for Review and Comments, RI = Released for Information

SIGNATURES

Prepared by: _____

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WP01B Work Package Lead

Reviewed by: _____

George Schneider, M.Sc., P.Geo.
Project Director - Principal

Approved by: _____

Joe Carvalho, Ph.D., P.Eng.
Technical Manager – Principal

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FIGURES

APPENDICES

1.0 INTRODUCTION

The Initial Borehole Drilling and Testing project in the Wabigoon and Ignace Area, Ontario is part of Phase 2 Geoscientific Preliminary Field Investigations of the NWMO's Adaptive Phased Management (APM) Site Selection Phase. This project involves the drilling and testing of the first of three deep boreholes within the northern portion of the Revell batholith.

Work Package WP01 addresses site establishment and site infrastructure activities for the drilling and testing of boreholes IG_BH01, IG_BH02 and IG_BH03, and the construction of access roads to IG_BH02 and IG_BH03 in the Wabigoon and Ignace area (Figure 1). The area is located a direct distance of approximately 21 km southeast of the Wabigoon Lake Ojibway Nation and a direct distance of 43 km northwest of the Town of Ignace.

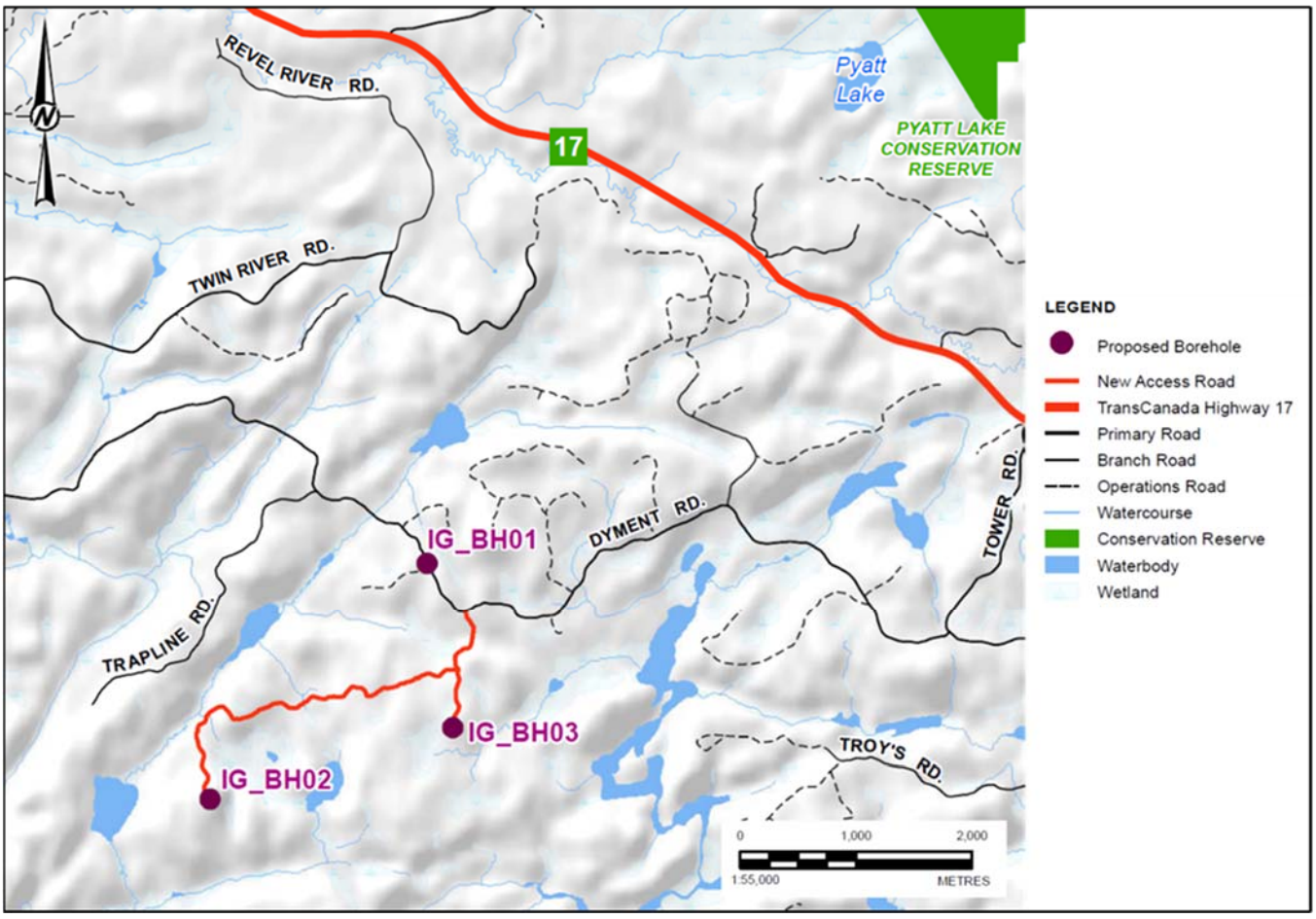

Figure 1: The location of IG_BH02 in relation to the Wabigoon / Ignace area.

This report describes the site infrastructure demobilization and site decommissioning activities that took place at IG_BH02 in January and July 2020. An aerial photo of the IG_BH02 site while in operation during in November 2019 is provided in Appendix A (Photo 1).

2.0 DEMOBILIZATION AND DECOMISSIONING ACTIVITIES

Demobilization and decommissioning activities at IG_BH02 described in this report took place during the following periods:

- September 2019 – Removal of two light towers.
- December 2019 – Removal of one office trailer.
- January 2020 – Removal of the workover rig and drill pad matting, temporary buildings, power system, communication system, waste and recycling bins, two light towers and security fencing, a general clean-up of the site, and an interim site decommissioning inspection by Golder.
- July 2020 – Removal of silt fencing, buried electrical conduits, general clean-up of the site, and final site decommissioning inspection by Golder.

The demobilization of site facilities was carried out by Taranis Contracting Group Ltd. (Taranis) and their subcontractors, the demobilization of the drill was carried out by Rodren Drilling Ltd. (Rodren), and the removal of perimeter snow and silt fencing and final site clean-up was carried out by Ricci Trucking (Ricci), all under the supervision of Golder.

2.1 Site Trailers

Office Trailers

Three mobile office trailers were located on the north side of site for use as field offices for Golder, the NWMO, and Rodren. In December 2019, it was determined that work areas could be combined into two of the three office trailers. To reduce rental and heating costs, one surplus office trailers was demobilized from site. Hoover Electric from Dryden, Ontario, was retained by Golder to disconnect the power supply to the surplus office trailer, and the trailer was demobilized by Taranis' subcontractor Secure Store and was transported to their facility in Shuniah, Ontario. The two remaining trailers were removed by Secure Store on January 29, 2020.

Core Logging and Storage Seacans

Two 12 m long modified shipping containers (seacans) were located at the southeast corner of site near the drill rig for use as work areas during WP02 through WP09. Upon completion of drilling and testing at IG_BH02, the two seacans were removed by Secure Store on January 30, 2020, and transported to their facility in Shuniah, Ontario. A photo of the core storage seacan being removed is shown in Appendix A (Photo 2).

Washrooms

The site washroom system consisted of three separate structures. The heated / insulated washcart was divided into men's and women's sections with separate entrances. Wastewater from the washcart flowed into the exterior 6,000 L septic tank located directly west of the washcart. Fresh water was supplied from a heated seacan containing a water storage tank. The washcart, wastewater tank and freshwater seacan were removed by SecureStore on January 29, 2020.

2.2 Site Internet and Wi-Fi

Cellular signals from the local mobile network were amplified for all site workers through the use of a Uniden cellular signal booster. Internet service for the site was provided through the local cellular network with a Bell Canada ZTE MF288 Turbo Hub. Emergency satellite communications were provided by a handheld Garmin In-

Reach SE. Following the demobilization of the site, all units were returned to their rental suppliers on January 31, 2020.

2.3 Power and Lighting

Power Generation

A CAT XQ100 diesel-electric generator was set up on the east side of site, and used to power the site trailers, core logging and core storage seacans, freshwater supply system, washcart, and the core extrusion seacan. The generator was set up inside a secondary containment tray which was sized so that the entire generator could fit within the walls of the containment, and so that the secondary containment capacity exceeded the capacity of fluids stored by the generator.

A 4,500 L double-walled fuel storage tank was located adjacent to the generator and was placed inside secondary containment with an overflow storage capacity which exceeded the capacity of fluids within the tank. The tank was placed on concrete pads to provide a stable foundation beneath the tank. Fibre matting was placed beneath the concrete pads to prevent punctures to the containment from the concrete pads. The fuel tank was surrounded by four concrete bollards to protect it from vehicular traffic and heavy machinery.

On January 31, 2020 the generator, fuel storage tank, and protective barricades were removed from site and taken by Taranis to their facility in Thunder Bay, Ontario. The fibre matting and concrete pads were discarded as non-hazardous waste.

Power Distribution

Power from the main site generator was distributed to the site facilities via double jacketed electrical cables. The majority of the power cables were mounted to the perimeter fencing and were removed on November 26, 2019. In areas where the electrical cables passed through a trafficable area, they were buried underground inside ABS conduits, and could not be removed in January 2020 due to frozen ground conditions. The buried underground cables and conduits were later removed by Ricci on July 8, 2020.

Lighting

Of the four 8-kW diesel powered light towers that were originally installed at site, two were removed in September 2019 due to the reduced lighting requirements during the testing phases of the program. The remaining two light towers were later removed on January 29, 2020.

2.4 Fencing

The security fencing at IG_BH02 was removed by Taranis on January 31, 2020. Snow and silt fencing had been installed around the perimeter of the drill site to mitigate the discharge of suspended sediments in the surface water runoff. The snow and silt fences could not be removed due to frozen ground conditions. The snow and silt fences were later removed on July 8, 2020 by Ricci.

2.5 Drilling Equipment

The Rodren workover rig was removed on January 25, 2020 and transported to Rodren's facility in Winnipeg, Manitoba. Beneath the workover rig was a secondary containment system with a central sump which captured any drill fluid spills that could potentially occur in the drill rig or drill fluid circulation system. Rig matting was placed over top of the central sump system, to provide a level and solid foundation for the drill rig infrastructure. The rig

matting and secondary containment system was removed on January 26, 2020, and also transported to Rodren's facility in Winnipeg, Manitoba.

No evidence of staining was observed beneath the workover rig or secondary containment system during removal. The sump area was able to be levelled using fill materials already at site.

2.6 Solid Waste

Solid waste was managed during operations on an ongoing basis using one garbage bin and one recycling bin, which were placed near the front entrance to the drill site, for ease of access by the garbage and recycling truck. The garbage and recycling bins were removed on January 30, 2020 by B&M Deliveries (Taranis subcontractor) of Dryden, Ontario. Waste material was transported by B&M Deliveries to the Town of Dryden Landfill Site for disposal.

2.7 Borehole Security

A final as-built survey of the borehole was performed by Rugged Geomatics Inc. on January 31, 2020, after the workover rig was removed. An aluminum plug and a locking protective casing was custom fabricated and installed at the IG_BH02 borehole collar on March 18, 2020. The aluminum plug is shown in Photo 3, and the protective casing is shown in Photo 4 of Appendix A.

3.0 FINAL SITE INSPECTION AND SUMMARY

Following completion of all site demobilization and decommissioning activities, a site walkover inspection was performed by Golder on July 9, 2020 accompanied by an NWMO representative. The objective of the inspection was to check for the presence of any remaining stained soils or litter which may still be present but had been obscured by the snow during the initial demobilization in January 2020. A grid pattern was walked across the entire site and it was visually confirmed that there was no remaining soil staining or litter at the site.

During the walkover, there were some small areas which had minor staining attributed to small oil drips, coffee spills, and natural colour variations in the fill materials. As a precautionary measure, Golder collected the stained fill material and placed it into a 1 m^3 storage tote for future off-site disposal. Golder also collected a composite sample of the material and had it characterized for disposal purposes in accordance with O.Reg. 347 and O.Reg. 588. The analytical results are provided in Appendix B and show that the fill material was non-hazardous. The fill material was accepted for disposal at the Township of Ignace Landfill, and was taken to the landfill by Ricci's Trucking in December 2020.

The completion of demobilization and decommissioning activities was documented as they took place and the results recorded on a site decommissioning checklist. The checklist was signed off by Golder representatives upon completion and is provided in Appendix C. Photos of the IG_BH02 drill site taken on July 8, 2020 upon completion of demobilization and decommissioning are provided in Appendix A (Photos 5 and 6). An aerial photo of the IG_BH02 drill site taken after Golder's July 8, 2020 departure is provided in Appendix A (Photo 7).

4.0 REFERENCES

Golder, 2018. WP1 – Site Infrastructure Plan and Access Road Construction Plan – Ignace Boreholes IG_BH01, IG_BH02 and IG_BH03 – Golder Associates, July 2018.

APPENDIX A

Site Photos – IG_BH02

Photo 1: Aerial drone photo of the commissioned IG_BH02 site, taken in November 2019.

Photo 2: Facing southeast towards the core storage seacan as it is being removed on January 30, 2020.

Photo 3: Facing west towards the aluminum plug fabricated to temporarily seal the top of the IG_BH02 borehole casing. The plug was installed on March 18, 2020

Photo 4: Facing northeast towards the lockable casing placed over the IG_BH02 drill collar on March 18, 2020.

Photo 5: Facing Northeast towards where the IG_BH02 office trailers and main site generator were placed, during the final site walkover on July 8, 2020.

Photo 6: Facing northwest towards the parking area for IG_BH02 during the final site walkover performed, July 8, 2020.

Photo 7: Aerial drone photo of the IG_BH02 site following the July 2020 demobilization.

APPENDIX B

Laboratory Certificates of Analysis for stained fill materials removed from IG_BH02

Your Project #: 1671632A
Your C.O.C. #: 615245-01-01

Attention: ADRIAN KOWALCHUK

GOLDER ASSOCIATES LTD
400-70 ARTHUR STREET
WINNIPEG, MB
CANADA R3B 1G7

Report Date: 2020/07/17
Report #: R2904036
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C048090
Received: 2020/07/10, 11:27

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX in Leachates by HS GC/MS/FID (1, 2)	1	2020/07/16	2020/07/17	AB SOP-00039	EPA 8260d m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs 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.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs 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 BV Labs, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by BV Labs Calgary Environmental
(2) Samples were extracted as per EPA 1311 unless otherwise noted in the report.

Bureau Veritas Laboratories Winnipeg: Unit D, 675 Berry Street R3H 1A7 Telephone (204) 772-7276 Fax (204) 772-2386

Your Project #: 1671632A
Your C.O.C. #: 615245-01-01

Attention: ADRIAN KOWALCHUK

GOLDER ASSOCIATES LTD
400-70 ARTHUR STREET
WINNIPEG, MB
CANADA R3B 1G7

Report Date: 2020/07/17
Report #: R2904036
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C048090
Received: 2020/07/10, 11:27

Encryption Key

Bureau Veritas Laboratories
17 Jul 2020 15:41:51

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Carmen McKay, Project Manager
Email: Carmen.MCKAY@bvlabs.com
Phone# (403)219-3683
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BV Labs Job #: C048090
Report Date: 2020/07/17

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Sampler Initials: AK

BTEX BY GC-MS (SOIL)

BV Labs ID		YB5144		
Sampling Date		2020/07/08 11:00		
COC Number		615245-01-01		
	UNITS	COMPOSITE	RDL	QC Batch
Volatiles				
Leachable (ZH) Benzene	ug/L	<10	10	9924267
Leachable (ZH) Toluene	ug/L	<10	10	9924267
Leachable (ZH) Ethylbenzene	ug/L	<10	10	9924267
Leachable (ZH) o-Xylene	ug/L	<10	10	9924267
Leachable (ZH) m & p-Xylene	ug/L	<20	20	9924267
Leachable (ZH) Xylenes (Total)	ug/L	<20	20	9924267
Surrogate Recovery (%)				
Leachable (ZH) 1,4-Difluorobenzene (sur.)	%	106		9924267
Leachable (ZH) 4-Bromofluorobenzene (sur.)	%	97		9924267
Leachable (ZH) D4-1,2-Dichloroethane (sur.)	%	87		9924267
RDL = Reportable Detection Limit				

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GENERAL COMMENTS

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

Package 1	3.3°C

Results relate only to the items tested.

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BV Labs Job #: C048090
Report Date: 2020/07/17

QUALITY ASSURANCE REPORT

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Sampler Initials: AK

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9924267	Leachable (ZH) 1,4-Difluorobenzene (sur.)	2020/07/17	102	50 - 140	102	50 - 140	105	%		
9924267	Leachable (ZH) 4-Bromofluorobenzene (sur.)	2020/07/17	99	50 - 140	101	50 - 140	98	%		
9924267	Leachable (ZH) D4-1,2-Dichloroethane (sur.)	2020/07/17	89	50 - 140	89	50 - 140	89	%		
9924267	Leachable (ZH) Benzene	2020/07/17	95	50 - 140	95	60 - 130	<10	ug/L	NC	30
9924267	Leachable (ZH) Ethylbenzene	2020/07/17	94	50 - 140	93	60 - 130	<10	ug/L	NC	30
9924267	Leachable (ZH) m & p-Xylene	2020/07/17	97	50 - 140	94	60 - 130	<20	ug/L	17	30
9924267	Leachable (ZH) o-Xylene	2020/07/17	94	50 - 140	94	60 - 130	<10	ug/L	5.5	30
9924267	Leachable (ZH) Toluene	2020/07/17	93	50 - 140	91	60 - 130	<10	ug/L	NC	30
9924267	Leachable (ZH) Xylenes (Total)	2020/07/17					<20	ug/L	14	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 (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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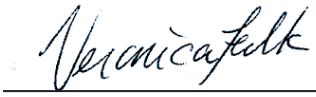
BV Labs Job #: C048090
Report Date: 2020/07/17

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Sampler Initials: AK

VALIDATION SIGNATURE PAGE

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



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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Your Project #: 1671632A
Site Location: IGNACE IG_BH02
Your C.O.C. #: 1of1

Attention: ADRIAN KOWALCHUK

GOLDER ASSOCIATES LTD
400-70 ARTHUR STREET
WINNIPEG, MB
CANADA R3B 1G7

Report Date: 2020/11/15
Report #: R2955444
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C080502
Received: 2020/10/30, 15:05

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Flammability	1	N/A	2020/11/13	CAL SOP-00028	TDG 6th ed 33 2015 m
ICPMS Metals on TCLP Leachate (1)	1	2020/11/04	2020/11/05	AB SOP-00043	EPA 6020b R2 m
Moisture	1	N/A	2020/11/04	AB SOP-00002	CCME PHC-CWS m
Benzo[a]pyrene Equivalency	1	N/A	2020/11/05		Auto Calc
PAH in Soil by GC/MS	1	2020/11/04	2020/11/04	AB SOP-00036 / AB SOP-00003	EPA 3540C/8270E m
TCLP pH Measurements	1	2020/11/04	2020/11/05	AB SOP-00006	SM 23 4500 H+B m

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Samples were extracted as per EPA 1311 unless otherwise noted in the report.

Bureau Veritas Laboratories Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 1671632A
Site Location: IGNACE IG_BH02
Your C.O.C. #: 1of1

Attention: ADRIAN KOWALCHUK

GOLDER ASSOCIATES LTD
400-70 ARTHUR STREET
WINNIPEG, MB
CANADA R3B 1G7

Report Date: 2020/11/15
Report #: R2955444
Version: 1 - Final

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BV LABS JOB #: C080502
Received: 2020/10/30, 15:05

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AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas Laboratories
15 Nov 2020 09:14:26

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Carmen McKay, Key Account Specialist
Email: Carmen.MCKAY@bvlabs.com
Phone# (403)219-3683
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BV Labs Job #: C080502
Report Date: 2020/11/15

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Site Location: IGNACE IG_BH02
Sampler Initials: AK

RESULTS OF CHEMICAL ANALYSES OF SOIL

BV Labs ID		YT8330		YT8330	
Sampling Date		2020/07/08 11:00		2020/07/08 11:00	
COC Number		1of1		1of1	
	UNITS	COMPOSITE	QC Batch	COMPOSITE Lab-Dup	QC Batch
Misc. Inorganics					
Leachable Initial pH of Sample	pH	8.46	A077753		
Leachable pH after HCl	pH	1.75	A077753		
Leachable Final pH of Leachate	pH	5.00	A077753		
Physical Properties					
Flammability	mm/sec	NON FLAM	A085922	NON FLAM	A085922
Lab-Dup = Laboratory Initiated Duplicate					

Bureau Veritas Laboratories Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

BV Labs Job #: C080502
Report Date: 2020/11/15

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Site Location: IGNACE IG_BH02
Sampler Initials: AK

PHYSICAL TESTING (SOIL)

BV Labs ID		YT8330		
Sampling Date		2020/07/08 11:00		
COC Number		1of1		
	UNITS	COMPOSITE	RDL	QC Batch
Physical Properties				
Moisture	%	5.8	0.30	A076802
RDL = Reportable Detection Limit				

Bureau Veritas Laboratories Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Site Location: IGNACE IG_BH02
Sampler Initials: AK

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

BV Labs ID		YT8330		
Sampling Date		2020/07/08 11:00		
COC Number		1of1		
	UNITS	COMPOSITE	RDL	QC Batch
Polycyclic Aromatics				
Acenaphthene	mg/kg	<0.0050	0.0050	A076170
B[a]P TPE Total Potency Equivalents	mg/kg	<0.0071	0.0071	A076265
Acenaphthylene	mg/kg	<0.0050	0.0050	A076170
Acridine	mg/kg	<0.010	0.010	A076170
Anthracene	mg/kg	<0.0040	0.0040	A076170
Benzo(a)anthracene	mg/kg	<0.0050	0.0050	A076170
Benzo(b&j)fluoranthene	mg/kg	<0.0050	0.0050	A076170
Benzo(k)fluoranthene	mg/kg	<0.0050	0.0050	A076170
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.0050	A076170
Benzo(c)phenanthrene	mg/kg	<0.0050	0.0050	A076170
Benzo(a)pyrene	mg/kg	<0.0050	0.0050	A076170
Benzo(e)pyrene	mg/kg	<0.0050	0.0050	A076170
Chrysene	mg/kg	<0.0050	0.0050	A076170
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0050	A076170
Fluoranthene	mg/kg	<0.0050	0.0050	A076170
Fluorene	mg/kg	<0.0050	0.0050	A076170
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	0.0050	A076170
1-Methylnaphthalene	mg/kg	<0.0050	0.0050	A076170
2-Methylnaphthalene	mg/kg	<0.0050	0.0050	A076170
Naphthalene	mg/kg	<0.0050	0.0050	A076170
Phenanthrene	mg/kg	<0.0050	0.0050	A076170
Perylene	mg/kg	<0.0050	0.0050	A076170
Pyrene	mg/kg	<0.0050	0.0050	A076170
Quinoline	mg/kg	<0.010	0.010	A076170
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	99		A076170
D8-ACENAPHTHYLENE (sur.)	%	95		A076170
D8-NAPHTHALENE (sur.)	%	92		A076170
TERPHENYL-D14 (sur.)	%	106		A076170
RDL = Reportable Detection Limit				

BV Labs Job #: C080502
Report Date: 2020/11/15

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Site Location: IGNACE IG_BH02
Sampler Initials: AK

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

BV Labs ID		YT8330	YT8330		
Sampling Date		2020/07/08 11:00	2020/07/08 11:00		
COC Number		1of1	1of1		
	UNITS	COMPOSITE	COMPOSITE Lab-Dup	RDL	QC Batch
Elements					
Leachable Antimony (Sb)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Arsenic (As)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Barium (Ba)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Beryllium (Be)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Boron (B)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Cadmium (Cd)	mg/L	<0.10	<0.10	0.10	A078253
Leachable Chromium (Cr)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Cobalt (Co)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Copper (Cu)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Iron (Fe)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Lead (Pb)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Mercury (Hg)	mg/L	<0.020	<0.020	0.020	A078253
Leachable Nickel (Ni)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Selenium (Se)	mg/L	<0.10	<0.10	0.10	A078253
Leachable Silver (Ag)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Thallium (Tl)	mg/L	<0.50	<0.50	0.50	A078253
Leachable Uranium (U)	mg/L	<0.20	<0.20	0.20	A078253
Leachable Vanadium (V)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Zinc (Zn)	mg/L	<1.0	<1.0	1.0	A078253
Leachable Zirconium (Zr)	mg/L	<1.0	<1.0	1.0	A078253

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

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GENERAL COMMENTS

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

Package 1	2.0°C

Sample YT8330 [COMPOSITE] : Sample was analyzed past method specified hold time for PAH in Soil by GC/MS. The minimum weight of 100g, or the ability to sieve through 1mm or 9.5mm for the standard TCLP extraction, as per Reference Method EPA 1311 R1992, could not be achieved due to insufficient sample or sample matrix. Client consent has been received to proceed using the modified TCLP method. The uncertainty of the analysis may be increased, and the reported results may not be suitable for compliance purposes.

Results relate only to the items tested.

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BV Labs Job #: C080502
Report Date: 2020/11/15

QUALITY ASSURANCE REPORT

GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Site Location: IGNACE IG_BH02
Sampler Initials: AK

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
A076170	D10-ANTHRACENE (sur.)	2020/11/04	87	50 - 130	92	50 - 130	94	%		
A076170	D8-ACENAPHTHYLENE (sur.)	2020/11/04	85	50 - 130	88	50 - 130	91	%		
A076170	D8-NAPHTHALENE (sur.)	2020/11/04	85	50 - 130	87	50 - 130	89	%		
A076170	TERPHENYL-D14 (sur.)	2020/11/04	88	50 - 130	91	50 - 130	92	%		
A076170	1-Methylnaphthalene	2020/11/04	91	50 - 130	99	50 - 130	<0.0050	mg/kg	80 (1)	50
A076170	2-Methylnaphthalene	2020/11/04	87	50 - 130	90	50 - 130	<0.0050	mg/kg	NC	50
A076170	Acenaphthene	2020/11/04	89	50 - 130	93	50 - 130	<0.0050	mg/kg	NC	50
A076170	Acenaphthylene	2020/11/04	83	50 - 130	86	50 - 130	<0.0050	mg/kg	NC	50
A076170	Acridine	2020/11/04	70	50 - 130	73	50 - 130	<0.010	mg/kg	NC	50
A076170	Anthracene	2020/11/04	86	50 - 130	94	50 - 130	<0.0040	mg/kg	NC	50
A076170	Benzo(a)anthracene	2020/11/04	91	50 - 130	92	50 - 130	<0.0050	mg/kg	NC	50
A076170	Benzo(a)pyrene	2020/11/04	55	50 - 130	91	50 - 130	<0.0050	mg/kg	NC	50
A076170	Benzo(b&j)fluoranthene	2020/11/04	82	50 - 130	84	50 - 130	<0.0050	mg/kg	41	50
A076170	Benzo(c)phenanthrene	2020/11/04	89	50 - 130	92	50 - 130	<0.0050	mg/kg	NC	50
A076170	Benzo(e)pyrene	2020/11/04	60	50 - 130	84	50 - 130	<0.0050	mg/kg	NC	50
A076170	Benzo(g,h,i)perylene	2020/11/04	85	50 - 130	90	50 - 130	<0.0050	mg/kg	NC	50
A076170	Benzo(k)fluoranthene	2020/11/04	87	50 - 130	92	50 - 130	<0.0050	mg/kg	NC	50
A076170	Chrysene	2020/11/04	89	50 - 130	92	50 - 130	<0.0050	mg/kg	NC	50
A076170	Dibenz(a,h)anthracene	2020/11/04	88	50 - 130	94	50 - 130	<0.0050	mg/kg	NC	50
A076170	Fluoranthene	2020/11/04	84	50 - 130	89	50 - 130	<0.0050	mg/kg	NC	50
A076170	Fluorene	2020/11/04	90	50 - 130	94	50 - 130	<0.0050	mg/kg	NC	50
A076170	Indeno(1,2,3-cd)pyrene	2020/11/04	85	50 - 130	90	50 - 130	<0.0050	mg/kg	NC	50
A076170	Naphthalene	2020/11/04	75	50 - 130	86	50 - 130	<0.0050	mg/kg	127 (1)	50
A076170	Perylene	2020/11/04	57	50 - 130	89	50 - 130	<0.0050	mg/kg	190 (1)	50
A076170	Phenanthrene	2020/11/04	87	50 - 130	94	50 - 130	<0.0050	mg/kg	2.9	50
A076170	Pyrene	2020/11/04	85	50 - 130	94	50 - 130	<0.0050	mg/kg	NC	50
A076170	Quinoline	2020/11/04	112	50 - 130	113	50 - 130	<0.010	mg/kg	NC	50
A076802	Moisture	2020/11/04					<0.30	%	12	20
A077753	Leachable Final pH of Leachate	2020/11/05			100	97 - 103			0.26	N/A
A077753	Leachable Initial pH of Sample	2020/11/05			101	97 - 103			0.69	N/A
A077753	Leachable pH after HCl	2020/11/05			100	97 - 103			13	N/A
A078253	Leachable Antimony (Sb)	2020/11/05	97	75 - 125	98	80 - 120	<1.0	mg/L	NC	35

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
A078253	Leachable Arsenic (As)	2020/11/05	100	75 - 125	100	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Barium (Ba)	2020/11/05	105	75 - 125	109	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Beryllium (Be)	2020/11/05	100	75 - 125	97	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Boron (B)	2020/11/05	103	75 - 125	124 (1)	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Cadmium (Cd)	2020/11/05	103	75 - 125	103	80 - 120	<0.10	mg/L	NC	35
A078253	Leachable Chromium (Cr)	2020/11/05	102	75 - 125	103	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Cobalt (Co)	2020/11/05	100	75 - 125	100	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Copper (Cu)	2020/11/05	99	75 - 125	99	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Iron (Fe)	2020/11/05	110	75 - 125	114	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Lead (Pb)	2020/11/05	99	75 - 125	101	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Mercury (Hg)	2020/11/05	106	75 - 125	100	80 - 120	<0.020	mg/L	NC	35
A078253	Leachable Nickel (Ni)	2020/11/05	102	75 - 125	100	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Selenium (Se)	2020/11/05	98	75 - 125	98	80 - 120	<0.10	mg/L	NC	35
A078253	Leachable Silver (Ag)	2020/11/05	102	75 - 125	102	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Thallium (Tl)	2020/11/05	100	75 - 125	101	80 - 120	<0.50	mg/L	NC	35
A078253	Leachable Uranium (U)	2020/11/05	103	75 - 125	101	80 - 120	<0.20	mg/L	NC	35
A078253	Leachable Vanadium (V)	2020/11/05	106	75 - 125	105	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Zinc (Zn)	2020/11/05	102	75 - 125	100	80 - 120	<1.0	mg/L	NC	35
A078253	Leachable Zirconium (Zr)	2020/11/05	103	75 - 125	102	80 - 120	<1.0	mg/L	NC	35
A085922	Flammability	2020/11/13							NC	25

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

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

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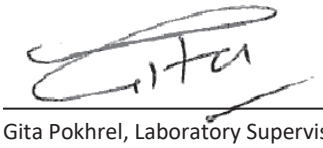
BV Labs Job #: C080502
Report Date: 2020/11/15

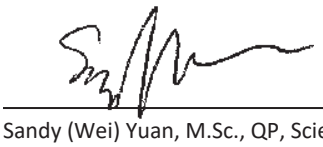
GOLDER ASSOCIATES LTD
Client Project #: 1671632A
Site Location: IGNACE IG_BH02
Sampler Initials: AK

VALIDATION SIGNATURE PAGE

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



Gita Pokhrel, Laboratory Supervisor



Sandy (Wei) Yuan, M.Sc., QP, Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

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APPENDIX C

Site Decommissioning Checklist – IG_BH02

Item No.	Item	General Requirements	Date Completed	Checked by	Verified by	Comments
1.0	**SITE PREPARATION**					
1.1	Drill pad	Drill pad cleaned of debris and adequately graded.	July 8, 2020	ATK	GWS	
1.3	General site levelling	General site cleaned of debris and adequately graded.	July 8, 2020	ATK	GWS	
1.4	General Site Condition	Site is free of oil sheens and staining.	Jan. 31, 2020	ATK	GWS	
2.0	**FENCING**					
2.1	Silt fencing	Silt fencing removed from site.	July 8, 2020	ATK	GWS	
2.2	Snow fencing	Silt fencing removed from site.	July 8, 2020	ATK	GWS	
2.3	Modulok security fencing	Security fencing dismantled and removed from site.	Jan. 31, 2020	ATK	GWS	
3.0	**OFFICE TRAILERS**					
3.1	Trailer 1 (Golder)	Trailer removed from site.	Dec. 5, 2019	ATK	GWS	
3.2	Trailer 2 (NWMO)	Trailer removed from site.	Jan. 29, 2020	ATK	GWS	
3.3	Trailer 3 (Rodren)	Trailer removed from site.	Jan. 29, 2020	ATK	GWS	
4.0	**CORE LOGGING AND STORAGE**					
4.1	Core Logging Shipping Container	Core Logging Shipping Container removed from site.	Jan. 30, 2020	ATK	GWS	
4.2	Core Logging Table	Core logging table put away for storage.	Jan. 7, 2020	ATK	GWS	
4.3	Camera Racking	Camera tracking put away for storage.	Jan. 7, 2020	ATK	GWS	
4.4	Core Storage Shipping container	Core storage shipping container removed from site.	Jan. 30, 2020	ATK	GWS	
4.5	Commercial Refrigerator	Refrigerators removed from site.	Jan. 7, 2020	ATK	GWS	
5.0	**COMMUNICATIONS**					
5.1	Satellite phone	Satellite phone removed from site.	Jan. 31, 2020	ATK	GWS	In-Reach was removed, didn't need sat phone
5.2	Cellular internet	Cellular Internet Wi-Fi network removed from site.	Jan. 31, 2020	ATK	GWS	
6.0	**GENERATOR**					
6.1	Generator	Generator removed from site.	Jan. 29, 2020	ATK	GWS	

Item No.	Item	General Requirements	Date Completed	Checked by	Verified by	Comments
6.2	Secondary containment	Secondary spill containment removed from site.	Jan. 31, 2020	ATK	GWS	
6.3	Power distribution	Power distribution cables and panels removed from site.	Jul. 7, 2020	ATK	GWS	
7.0	**LIGHT TOWERS**					
7.1	Light Tower	All light towers removed from site.	Jan. 29, 2020	ATK	GWS	
7.2	Secondary containment	All secondary spill containments for light towers removed from site.	Jan. 29, 2020	ATK	GWS	
8.0	**FUEL STORAGE**					
8.1	Fuel tank	Fuel Tank removed from site.	Jan. 31, 2020	ATK	GWS	
8.2	Secondary containment	Secondary spill containment removed from site.	Jan. 31, 2020	ATK	GWS	
8.3	Protective barricade	Protective barricades removed from site.	Jan. 31, 2020	ATK	GWS	
9.0	**SANITARY FACILITIES**					
9.1	Washroom	Washroom removed from site.	Jan. 29, 2020	ATK	GWS	
9.2	Water tank	Water tank removed from site.	Jan. 29, 2020	ATK	GWS	
9.3	Septic tank	Septic tank removed from site.	Jan. 29, 2020	ATK	GWS	
9.3	Temporary Washroom Facilities	Temporary washroom facilities removed from site.	Jan. 29, 2020	ATK	GWS	
10.0	**GARBAGE BINS**					
10.1	Garbage Bin	Garbage bin removed from site.	Jan. 30, 2020	ATK	GWS	
10.2	Recycling Bin	Recycle bin removed from site.	Jan. 30, 2020	ATK	GWS	
11.0	**WELL HEAD**					
11.1	Well Head Survey	Well head casing reference and Westbay casing is surveyed to benchmark.	Jan. 31, 2020	ATK	GWS	
11.2	Well Head Security	Well head protective casing is installed, painted for visibility, and locked for security.	Mar. 18, 2020	ATK	GWS	
12.0	**OTHER**					

Item No.	Item	General Requirements	Date Completed	Checked by	Verified by	Comments
12.1	Post-Thaw Site Condition	Post-thaw inspection for garbage and debris.	July 9, 2020	ATK	GWS	
12.2	Drill Rig	Removed from Drill Pad	Jan. 25, 2020	ATK	GWS	
12.3	Drill Rig Foundation	Secondary containment and Timbers removed, Drill pad leveled	Jan. 26, 2020	ATK	GWS	

Completed by: Adrian Kowalchuk July 09, 2020

Adrian Kowalchuk (Golder) Date:

Verified by: November 26, 2020

George Schneider Date:

golder.com