



Impact Assessment Study – Mining Hazards 4380 Trail Road, Ottawa, Ontario

Client:

GFL Environmental Inc
2705 Stevenage Drive
Ottawa, Ontario

Attention:

David Elsie

Type of Document:

Final

Project Name:

Impact Assessment Study – Mining Hazards

Project Number:

OTT-21023795-A0

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Date Submitted:

December 1, 2023

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1 Introduction

1.1 Project Description

Since 2015, Drain-All Ltd. (now Green For Life [GFL]), has been managing inert fill and clean soil at a former sand and gravel pit located at 4380 Trail Road hereinafter referred to as the 'Site'. These activities are now governed by Ontario Regulation 406/19. In December 2020, GFL submitted an Environmental Compliance Approval (ECA) application to the Ministry of Environment Conservation and Parks (MECP) for the continuation of the operation of the soil management activities. As part of the ECA approval process, the MECP requires that the zoning needs to be changed to match the site operations. Specifically, the zoning for the Site needs to be amended to Rural General Industrial Zone (RG) from Parks and Open Space Zone – O1 and Mineral Aggregate Reserve Zone, Rural Exception 7 – MR[7r].

As part of the Zoning By-Law Amendment (ZBLA) and Site Plan Approval (SPA) process, an Impact Assessment Study – Mining Hazard (IAS) is required to be completed.

1.2 Project Objectives

As per the City of Ottawa Terms of Reference, the objective of an IAS is to identify or confirm if lands have been mined for minerals, petroleum or mineral aggregates and to evaluate the site for the presence of mine hazards. Where a mine hazard, or abandoned pit or quarry exists, the proponent is to:

- Evaluate the potential risks to human health and property;
- Establish measures to address and mitigate known or suspected risks; and,
- Demonstrate that the site can be rehabilitated to support the proposed development.

1.3 Scope of Work

To achieve the objectives, EXP completed the following:

- Review previous reports;
- Review provincial databases;
- Review planning requirements;
- Conduct site reconnaissance;
- Compile data; and,
- Prepare a report summarizing the results of the investigation.

2 Site Background

2.1.1 Site Description

The Site is a former sand and gravel pit that is located on the south side of Trail Road, east of Moodie Drive (Figure 1). The Site covers an area of approximately 4.2 hectares. The Site is bounded by the active Trail Road Landfill to the north across Trail Road, and the closed Nepean Landfill to the north and west. The property to the south and west of the Site is referred to as the South Aggregate Pond, which is involved with sand and gravel extraction. Industrial properties are also present in the study area (Figure 2).

According to the City of Ottawa GeoOttawa on-line mapping tool, the south part of the IAS property is zoned for mineral extraction. The northwest part of the IAS property, parallel to the property line, is zoned for open space. Surrounding properties to the south, east, and west are zoned mineral extraction zones. The property north of the IAS property is zoned rural countryside.

The former a gravel pit that was historically operated by different owners predated the licensing requirements under the Aggregate Resources Act, which came into effect in 1990. Apart from extraction activities, the site has not been developed in the past.

2.1.2 Previous Studies

As part of the ZBLA and SAP process, EXP has completed several studies for the site:

- EXP Services Inc., Proposed Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario, May 13, 2022
- EXP Services Inc. Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario
- EXP Services Inc. Geotechnical Investigation – Slope Stability Analysis in Support of Zoning By-Law Amendment, 4380 Trail Road, Ottawa, Ontario, December, 2023
- EXP Services Inc. Phase One Environmental Site Assessment, 4380 Trail Road, Ottawa, Ontario, June, 2023
- EXP Services Inc. Stormwater Management Report, 4380 Trail Road, Ottawa, ON, December, 2023
- EXP Services Inc. Zoning Plan C002
- EXP Services Inc. Site Rehabilitation Plan C003
- EXP Services Inc. Ultimate Siter Grading Plan C200-4
- EXP Services Inc. Ultimate Erosion and Sediment Control Plan C300
- EXP Services Inc. Pre-Development Catchments C400
- EXP Services Inc. Post-Development Catchments C500

Based on the previous studies, the Phase One Environmental Assessment and Groundwater Monitoring did not identify environmental impacts related to past or current site operations. The slope stability report recommended rehabilitation steps be considered to stabilize the steeper slope sections on site. This latter work indicated some of the existing gravel slopes required regrading and/or backfill placement.

The civil engineering studies and drawings have been completed to support continued site operations related to soil management.

2.1.3 Site Topography

Topographic surveys were completed by EXP (February 2022) and Farley, Smith and Denis Surveying (April 2022) to a geodetic benchmark. The surveys indicate the surface elevation of the Site base ranges between approximately 99.5 metres above sea level (masl) at the west end of the Site to 101.8 masl at the east end of the Site. Trail Road, representing original ground surface, is approximately 110.5 masl.

As the Site, and surrounding properties to the south (South Aggregate Ponds) have been used for extraction of aggregate resources and landfilling, the topography varies significantly locally.

2.1.4 Local Surface Water Features

The IAS property is located on the north boundary of the Mud Creek watershed. Properties to the east are part of the Jock River – Leamy Creek Watershed, and properties to the north are part of the Jock River Barrhaven watershed.

The South Aggregate Ponds (Burnside Ponds) are present south adjacent to the Phase One property. The ponds were generated by aggregate extraction activities on the property. Due to extraction activities, the elevation of the ponds is significantly lower than surrounding properties. The ponds have no outlet and can therefore be considered representative of the local water table (shallow aquifer).

Engineering studies are being completed by EXP to manage stormwater on-site.

2.1.5 Local Geology

A summary of subsurface soil stratigraphy is provided in the following paragraphs. The soil descriptions are based on the borehole logs from previous investigations. Based on the borehole logs, the general subsurface soil stratigraphy consists of the following units from top to bottom:

Sand

A layer of fine, medium to coarse grained, well-sorted sand was present from surface to between 17 to 37 m bgs. The sand was interbedded with layers of fine to very fine-grained sand.

Silty Cobbly Till

A silty cobble till was encountered overlying the bedrock in MW-1 (P-1) (encountered 17.2 meters below ground surface). This layer consisted of poorly sorted till with cobbles.

Dolostone Bedrock

Bedrock was not encountered in any of the boreholes on the Site. Based on regional maps and previous investigations, bedrock is anticipated to be dolostone of the Oxford Formation and present approximately 30 to 35 m bgs. In boreholes to the southeast and north of the Site bedrock was encountered at 17 m bgs and 37 m bgs respectively. Bedrock appears to be dipping to the north.

2.1.6 Local Hydrogeology

Static water levels in the monitoring wells installed on the Site were recorded on June 8, 2022 and May 5, 2023. Based on field measurements, the static water level in the overburden deposit ranged from 2.8 m to 6.7 metres below ground surface (mbgs) in May 2023 and 3.2 to 7.0 mbgs in June 2022. Based on the depth to groundwater measures, there was a difference of 0.3 to 0.43 metre between wet and dry seasons.

Based on the above water levels, the shallow overburden groundwater flow direction on the Site is to the north (Figure 2 and 3).

2.2 Site History

2.2.1 Site Ownership

Based on a review of GeoWarehouse, the following ownership chain was identified:

Sale Date	Type	To
July 31, 2013	Transfer	Drain-All Industrial Services Ltd..
July 30, 2008	Transfer	2177302 Ontario Ltd.

May 9, 1998	Transfer	Bakermet Inc.
Sep 12, 1967	Transfer	Marcel Brazeau
November 26, 1953	Transfer	Patrick Lennon

2.2.2 Provincial Database Review

EXP reviewed the Geology Ontario website, www.geologyontario.mndm.gov.on.ca and Aggregate Resources Inventory of the City of Ottawa, Southern Ontario; Ontario Geological Survey. Based on that review, there are no records of abandoned mines or wells at the site. The site is free of any mine hazards, which is current to the updated Geology Ontario site, 2022-04-29.

2.2.3 Historical Aerial Photographs

Aerial photographs dated 1976, 1991, 1999, 2005, 2008, 2015, and 2019 were available for review on the City of Ottawa website. Aerial photographs dated prior to 1976 were not available for review. The following table summarizes the development and land use history of the IAS property and adjacent properties as depicted on the reviewed aerial photographs. Copies of the aerial photographs are provided in Appendix E.

Year	Details
1976	The IAS property, as well as the adjacent properties to the east and south appear to be operating as aggregate resource operations. The Nepean Landfill is present to the west of the IAS property. The remainder of the IAS study area consists of farmland.
1991	Additional material has been removed from the IAS property, and aggregate stockpiles are present on the site. Expansion of aggregate resource activities has occurred on the south adjacent properties. The Trail Road landfill is present to the north of the IAS property across Trail Road.
1999	No significant changes on the IAS property or adjacent and surrounding properties.
2005	Pit operations no longer appear active on the site or south adjacent property. The excavated area on the south adjacent property has infilled with water (South Aggregate Ponds).
2008	The IAS property is similarly developed to the 2005 aerial photograph. The Plastec energy-from-waste demonstration facility has replaced the existing building on the property to the west. Trail Road landfill operations have expanded to the east.
2015	The IAS property is in use as a soil disposal site. The de-canting area for liquid soils is visible at the northwest corner of the site. No significant changes were observed on the adjacent and surrounding properties.
2019	No significant changes on the IAS property or adjacent and surrounding properties.

The IAS property appears to have been used as an aggregate resource operation between the 1970s and the 1990s. As of 2015, Drain-All has been operating the IAS property as a receiver site for unimpacted excess soil.

2.2.4 Current Operations

Since 2015, GFL has been operating the Site as a receiver site for unimpacted excess soil generated from various construction sites throughout the region. There are two areas where soil is stored on the Site. Incoming excess soil is initially placed in either Zone A for liquid soils (for decanting) or Zone B for dry soils. The soil is then sampled and analyzed for various parameters to confirm suitability for final placement on the site (Figure 2).

During this time, the IAS property has received approximately 30,000 tonnes of clean soil. Imported fill material consists of excess soil generated from various construction sites throughout the region.

3 Physical Site Review

3.1 Current Site Conditions

On July 21, 2023, EXP conducted a site visit and reviewed basic operational matters with the GFL representative. Photographs of our inspection are provided in Appendix E. During our site visit, we examined the area for any evidence of mine hazards and for any indication of former extraction workings.

Based on our site observations, no evidence of previous aggregate extraction activities and/or risks associated with aggregate extraction were noted.

3.2 Security and Site Access

Access to the Site during operating hours comes from a gated entrance on Trail Road at the north end of the IAS site. When not in business, the gate is locked to prevent vehicle traffic. To the north, there is a medium height (1-2 m) treed/bushed berm that runs along Trail Road along the north property boundary. Along the northwest and west property lines adjacent to the former Nepean Landfill, there is sporadic wire fencing whereas the property to the east is fenced along Trail Road. Access to the Site along the south property line is limited by the esc.

Due to its location, there is limited potential for pedestrian traffic onto the Site.

3.3 Site Rehabilitation

As part of the application for rezoning and site plan approval, a rehabilitation plan has been prepared for the site.

4 Planning Review

Policies for the management of hazards, both natural and human-made, to protect human health are set out in the Provincial Policy Statement (PPS 2020) and the City of Ottawa Official Plan.

4.1 Provincial Policy Statement (PPS 2020)

The PPS 2020 states that:

“Development on, abutting or adjacent to lands affected by mine hazards; oil, gas and salt hazards; or former mineral mining operations, mineral aggregate operations or petroleum resource operations may be permitted only if rehabilitation or other measures to address and mitigate known or suspected hazards are under way or have been completed” (PPS Section 3.2.1)

The proposed use can be considered as an activity which is related to the rehabilitation of a former (unlicensed) sand and gravel pit operation. The studies completed by EXP have confirmed that there are no mine hazards on the subject property.

Section 3.2.3 of the PPS states:

“Planning authorities should support, where feasible, on-site and local re-use of excess soil through planning and development approvals while protecting human health and the environment.”

The proposed rezoning is consistent with the policies of the PPS as they relate to protecting public health and safety.

4.2 City of Ottawa Official Plan

The Official Plan for the City of Ottawa was recently updated and approved by the Ministry of Municipal Affairs and Housing in November 2022.

Section 10 of the Official Plan sets out policies for the Protection of Health and Safety and includes measures to protect people and property from the impacts of natural and human-made conditions. Section 10.1.10 deals “Abandoned mineral and mineral aggregate mining operations, and abandoned petroleum resource operations”.

In general, the policies provide that development shall be directed away from areas of natural or human-made hazards, where there is an unacceptable risk to health or safety or of property damage, and shall not create new, or aggravate existing, hazards.

Prior to development on lands adjacent to hazards from mining it shall be required to identify, address and mitigate known or suspected hazards. Where development is proposed where a mine hazard, or abandoned pit or quarry exists, the proposal shall:

- a) Evaluate the potential risks to human health and property.
- b) Establish measures to address and mitigate known or suspected risks; and
- c) Demonstrate that the site can be rehabilitated to support the proposed land use.

Development shall not be permitted within 300 metres of a mine hazard, or abandoned pit or quarry unless measures to address and mitigate known or suspected risks to human health and property are provided.

The proposed zoning amendment would permit the ongoing use of the property for the management of excess soils, in coordination with an Environmental Compliance Approval from the MECP. Management of excess soils at active and depleted mineral aggregate resource operations is common in Ontario. Imported fill is often required to rehabilitate aggregate sites. This activity is jointly regulated by the Ministries of Natural Resources and Forestry (MNRF) and Environment Conservation and Parks (MECP).

The subject lands are within an area of former and active mineral aggregate operations. All of the adjacent properties on the south side of Trail Road are zoned for mineral aggregate extraction. The parcel on the north side of Trail Road is zoned Rural and used as the Trail Road Landfill operated by the City of Ottawa. There are no sensitive land uses located in proximity to the GFL site (Figure 2). There are no expected risks to human health or property associated with the proposed use.

The proposed rezoning conforms with the policies in the City of Ottawa's Official Plan.

5 Conclusions

Based on our site visit and records review, no previous mining or aggregate extraction hazards were observed at the site that could cause potential human and /or property risk.

6 Limitations

This report is based on a limited investigation designed to provide information to support an assessment of the current and future site operations as it pertains to risk to human health and property. The conclusions and recommendations presented within this report reflect Site conditions existing at the time of the assessment.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience/engineering profession. No other warranty or representation, either expressed or implied, is included or intended in this report.

This report was prepared for the exclusive use of GFL Environmental Services Inc. This report may not be reproduced in whole or in part, without the prior written consent of EXP, or used or relied upon in whole or in part by other parties for any purposes whatsoever. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this information is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

EXP Services Inc.



Chris Kimmerly, M.Sc., P.Geo. QPESA.
Senior Geoscientist
Environmental Services



Greg Hunt, P.Eng.
Senior Rock Engineer
Environmental Services



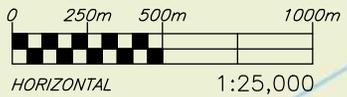
Melanie Horton,
President
Esher Planning Inc.

7 References

- EXP Services Inc., Proposed Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario, May 13, 2022
- EXP Services Inc. Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario
- EXP Services Inc. Geotechnical Investigation - Slope Stability Analysis in Support of Zoning By-Law Amendment, 4380 Trail Road, Ottawa, Ontario, December 2023
- EXP Services Inc. Phase One Environmental Site Assessment, 4380 Trail Road, Ottawa, Ontario, June 23, 2023
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- EXP Services Inc. Ultimate Erosion and Sediment Control Plan C300
- EXP Services Inc. Pre-Development Catchments C400
- EXP Services Inc. Post-Development Catchments C500
- Lee, V.L., 2013 Aggregate Resources Inventory of the City of Ottawa, Southern Ontario; Ontario Geological Survey, Aggregate Resources Inventory Paper 191, 80p
- Natural Resources Canada, The Atlas of Canada - Toporama website (atlas.gc.ca/toporama/en/)
- Oil, Gas & Salt Resources Library, website (maps.ogsrlibrary.com/wells)
- Ontario Ministry of Energy, Northern Development and Mines, Bedrock Geology Application (www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth/bedrock-geology), March 19, 2018
- Ontario Ministry of Energy, Northern Development and Mines, Surficial Geology Application (www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth/surficial-geology), May 23, 2017
- Ontario Ministry of the Environment, Conservation and Parks, Access Environment website (www.accessenvironment.ene.gov.on.ca)
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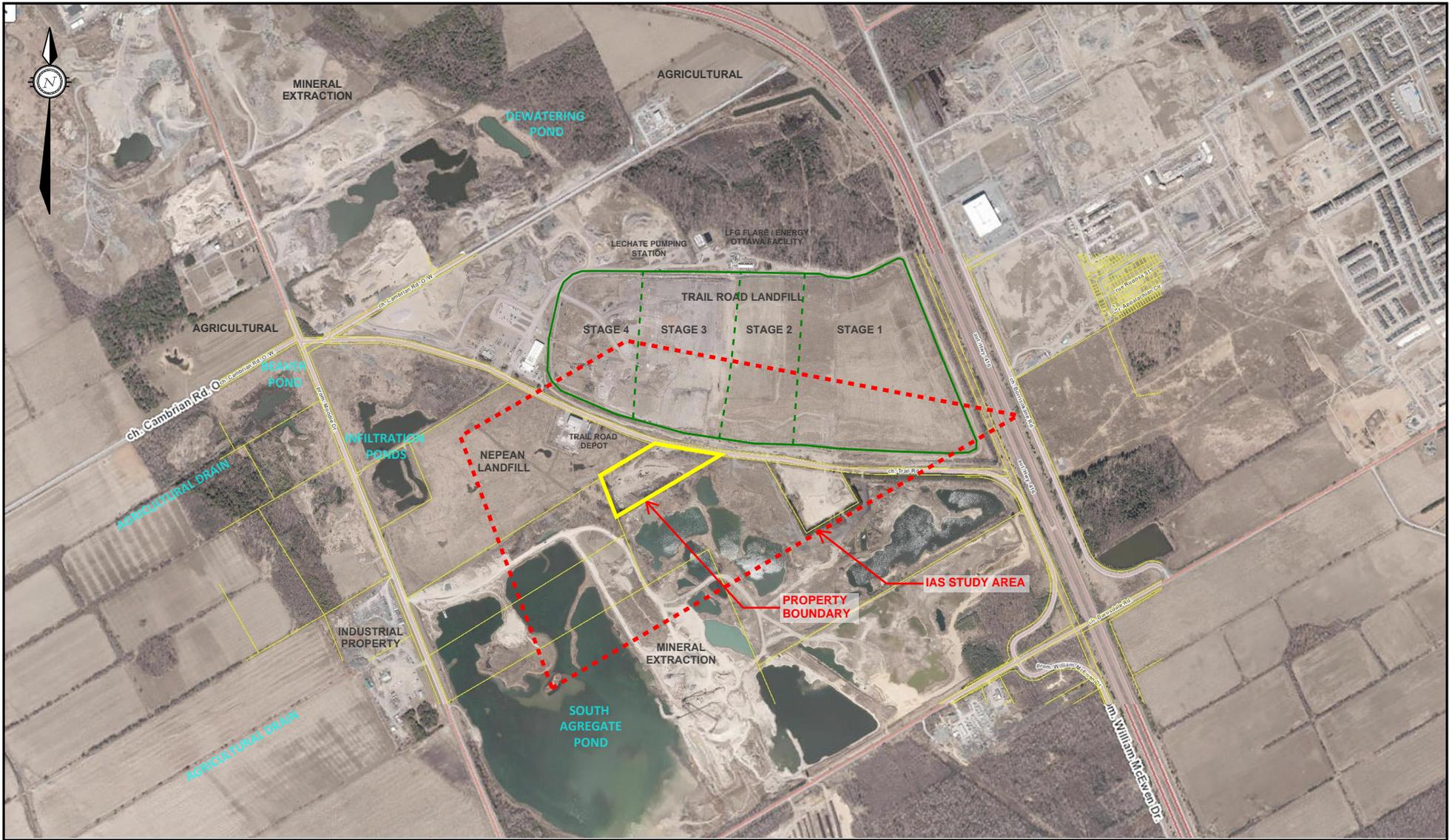
Appendix A – Figures

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exp Services Inc. 100-2650 Queensview Drive Ottawa, ON K2B 8H6 www.exp.com		DESIGN CK / LW	IMPACT ASSESSMENT STUDY - MINING HAZARDS 4380 TRAIL ROAD, OTTAWA, ONTARIO	SCALE 1:25,000
		DRAWN AS		SKETCH NO
		DATE SEPTEMBER 2023 FILE NO OTT-21023795-B0		FIG 1

SITE LOCATION PLAN



LEGEND
 ——— SITE BOUNDARY
 - - - - 300 METRE STUDY AREA

Reference Drawing used from *Dillon Consulting Ltd.*, 2019 Nepean Landfill Site Monitoring and Operating Program Final Report

exp Services Inc.
 100-2650 Queensview Drive
 Ottawa, ON K2B 8H6
 www.exp.com

exp.

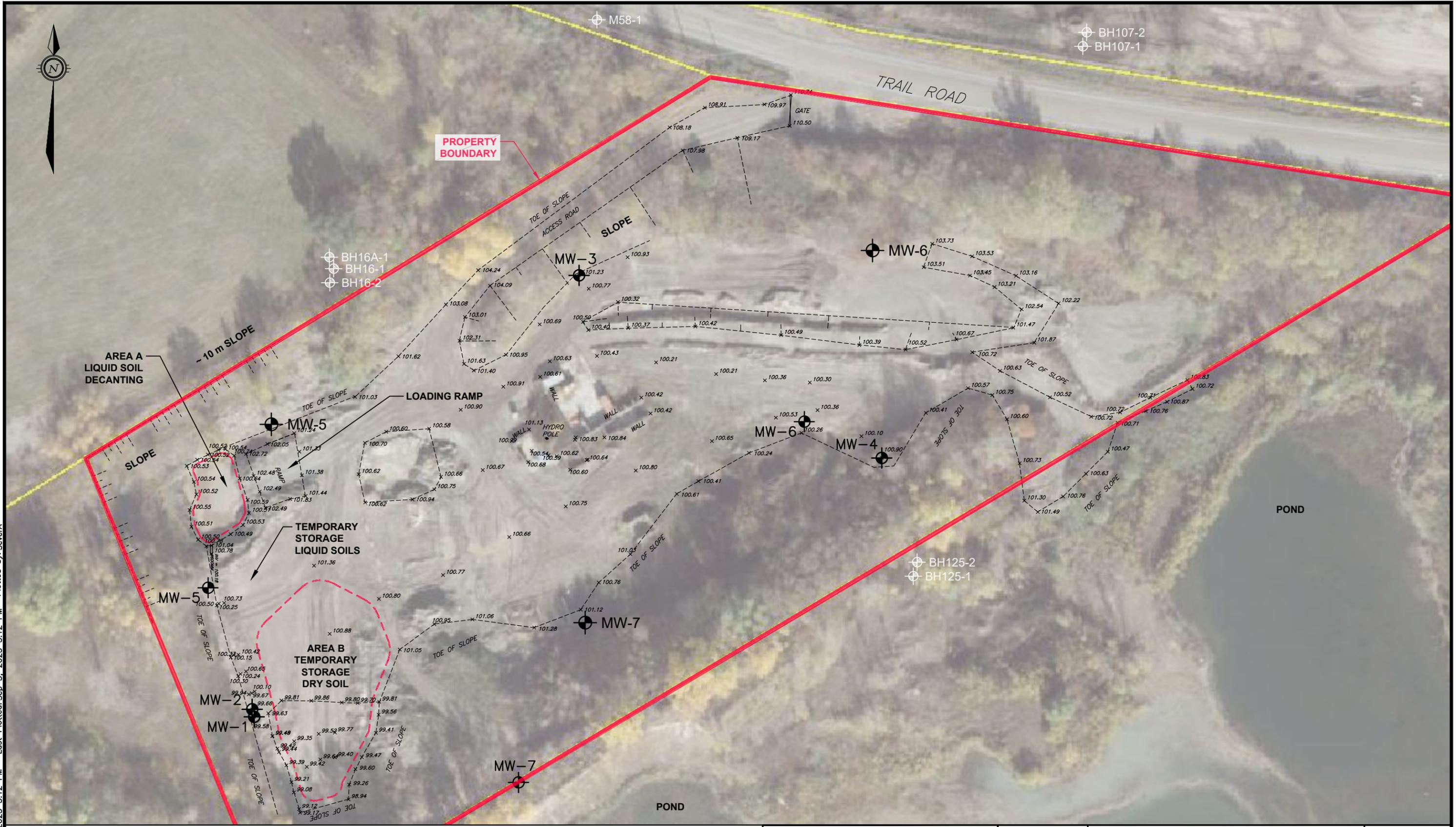
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 DRAWN AS
 DATE SEPTEMBER 2023
 PROJECT NO. OTT-21023795-B0

IMPACT ASSESSMENT STUDY - MINING HAZARDS
 4380 TRAIL ROAD, OTTAWA, ONTARIO

STUDY AREA SITE PLAN

SCALE N.T.S.

FIG 2



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LEGEND	
MONITORING WELL LOCATION	
GROUND ELEVATION	x 99.58
OFF-SITE MONITORING WELL NO. & LOCATION	
	HORIZONTAL 1:1000

exp Services Inc.
 100-2650 Queensview Drive
 Ottawa, ON K2B 8H6
www.exp.com

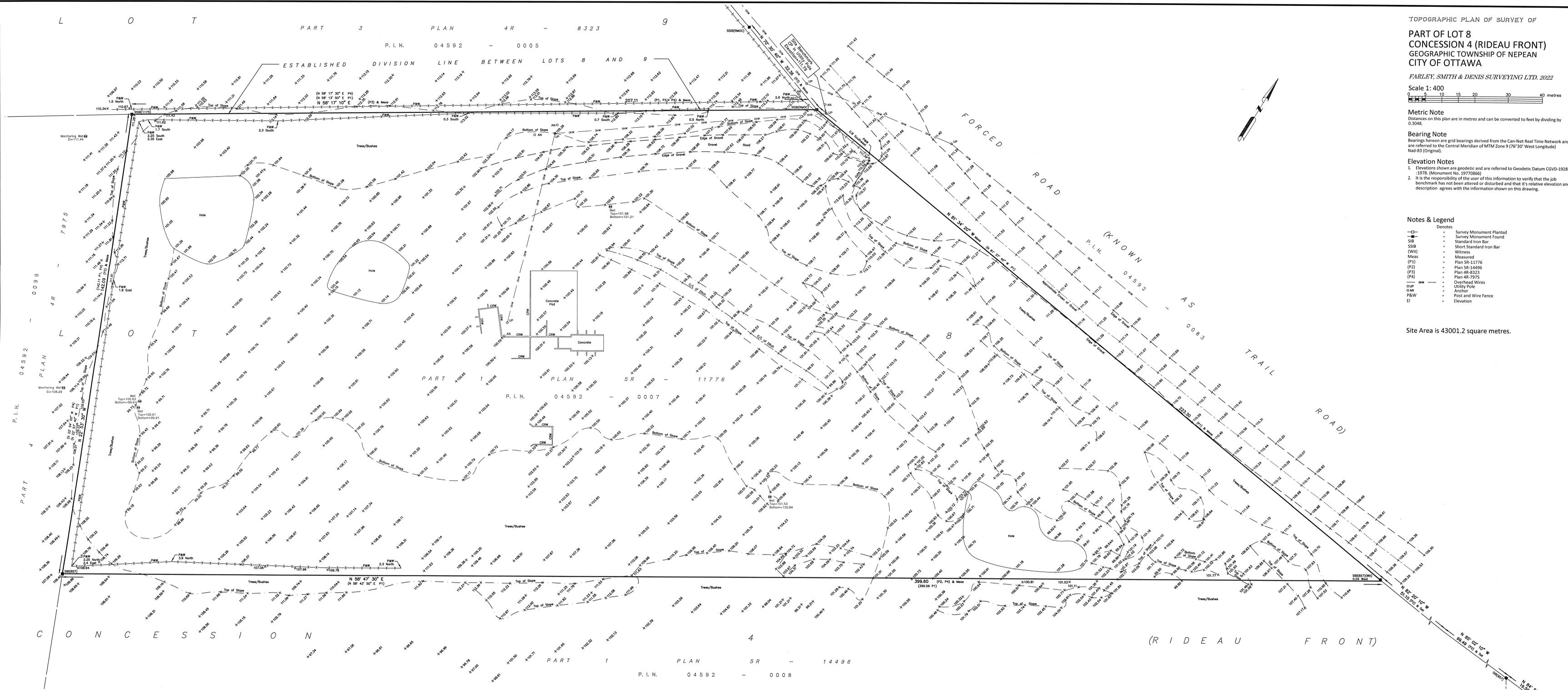


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DRAWN	AS
DATE	SEPTEMBER 2023
FILE NO	OTT-21023795-B0

IMPACT ASSESSMENT STUDY - MINING HAZARDS 4380 TRAIL ROAD, OTTAWA, ONTARIO
SITE LAYOUT

SCALE 1:1000
SKETCH NO FIG 3

Appendix B – Topographic and Legal Surveys



TOPOGRAPHIC PLAN OF SURVEY OF
**PART OF LOT 8
 CONCESSION 4 (RIDEAU FRONT)**
 GEOGRAPHIC TOWNSHIP OF NEPEAN
 CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD., 2022

Scale 1: 400
 0 10 20 30 40 metres

Metric Note
 Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.

Bearing Note
 Bearings hereon are grid bearings derived from the Can-Net Real Time Network and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

Elevation Notes
 1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 -1978 (Monument No. 19770866).
 2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that its relative elevation and description agrees with the information shown on this drawing.

Notes & Legend

Denotes	
□	Survey Monument Planted
■	Survey Monument Found
SIB	Standard Iron Bar
SSIB	Short Standard Iron Bar
(Wt)	Witness
Meas	Measured
(P1)	Plan 58-11776
(P2)	Plan 58-14406
(P3)	Plan 48-8323
(P4)	Plan 48-7975
OW	Overhead Wires
UP	Utility Pole
AW	Anchor
P&W	Post and Wire Fence
El	Elevation

Site Area is 43001.2 square metres.

WARNING: NO PERSON MAY COPY, REPRODUCE, DISTRIBUTE OR ALTER THIS PLAN IN WHOLE OR IN PART WITHOUT THE WRITTEN PERMISSION OF FARLEY, SMITH & DENIS SURVEYING LTD. © FARLEY, SMITH & DENIS SURVEYING LTD., 2022.

This plan of survey relates to AOLS Plan Submission Form Number V-25590.
Surveyor's Certificate
 I certify that:
 1. This survey and plan are correct and in accordance with the Survey Act, the Surveyors Act and the Regulations made under them.
 2. The survey was completed on the 20th day of April, 2022.
 Date: April 27, 2022
 Jamie Leslie
 Ontario Land Surveyor

FARLEY, SMITH & DENIS SURVEYING LTD.
 ONTARIO LAND SURVEYORS
 CANADA LAND SURVEYORS
 Unit 275, 30 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
 TEL: (613) 727-8226 E-mail: fdsurveys@bellnet.ca

Appendix C – Engineering Drawings

GENERAL NOTES:

- FOR SURVEY, REFER TO TOPOGRAPHIC PLAN OF SURVEY OF PART OF LOT 8 CONCESSION 4 (RIDEAU FRONT), GEOGRAPHIC TOWNSHIP OF NEPEAN, CITY OF OTTAWA, PREPARED BY FARLEY, SMITH AND DENNIS SURVEYING LTD, DATED APRIL 27, 2022.

PROJECT DESCRIPTION:

- ZONING AMENDMENT TO CONTINUE EXISTING ACTIVITY OF THE PLACEMENT OF EXCESS SOILS ON SITE.

SITE DATA:

- SITE AREA: 42,992 m²/4.299 ha

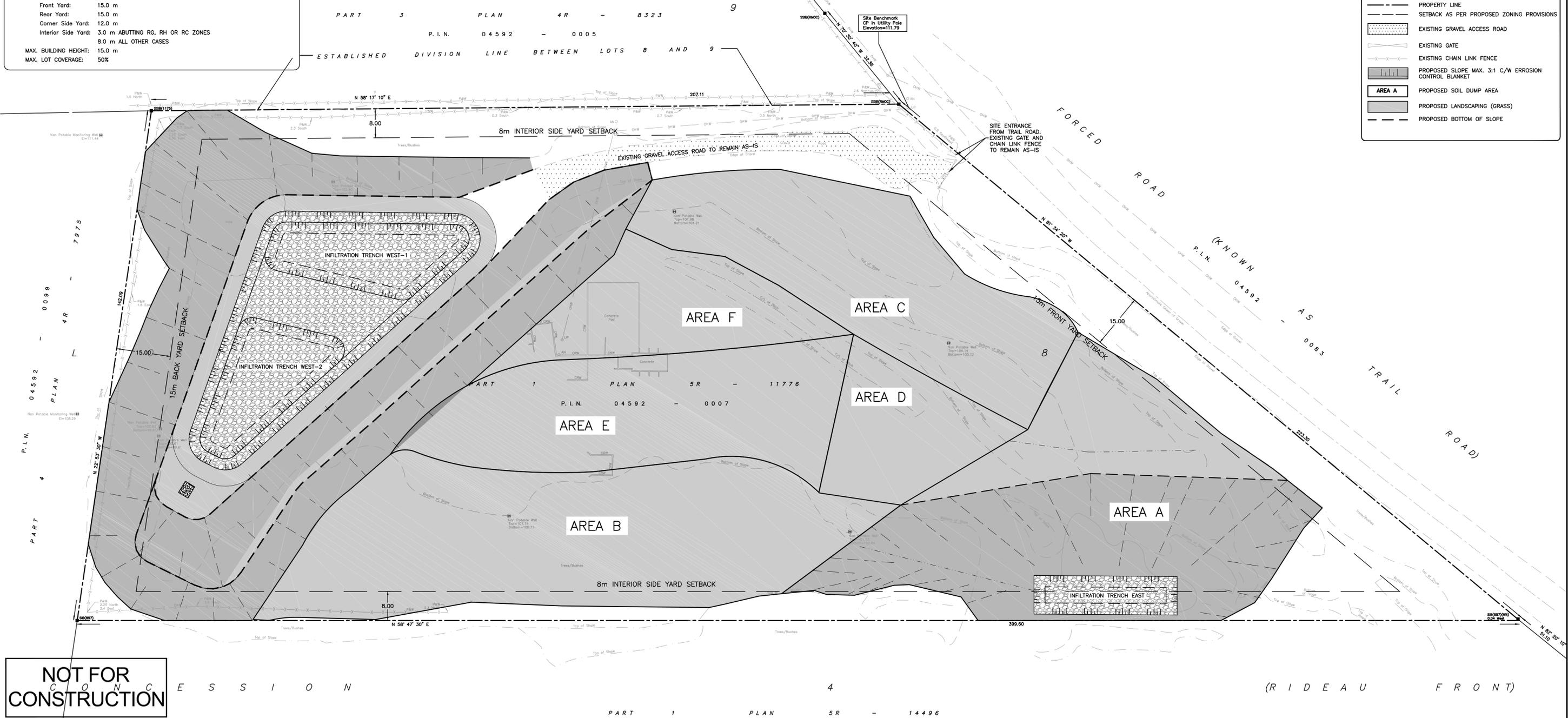
ZONING:

- EXISTING ZONING DESIGNATIONS (PART 18):
 PORTION ALONG NORTH-WEST PROPERTY LINE: O1 - PARKS AND OPEN SPACE ZONE
 PORTION ALONG SOUTH-EAST PROPERTY LINE: MR[7] - MINERAL AGGREGATE RESERVE ZONE
- PROPOSED ZONING:
 ENTIRE SITE: RG - RURAL GENERAL INDUSTRIAL ZONE
- PROPOSED ZONING PROVISIONS:
 RG - RURAL GENERAL INDUSTRIAL ZONE (TABLE 219):
 MIN. LOT WIDTH: 30.0 m
 MIN. LOT AREA: 4000.0 m²
 MIN. SETBACKS:
 Front Yard: 15.0 m
 Rear Yard: 15.0 m
 Corner Side Yard: 12.0 m
 Interior Side Yard: 3.0 m ABUTTING RG, RH OR RC ZONES
 8.0 m ALL OTHER CASES
 MAX. BUILDING HEIGHT: 15.0 m
 MAX. LOT COVERAGE: 50%



LEGEND

- PROPERTY LINE
- - - SETBACK AS PER PROPOSED ZONING PROVISIONS
- [Pattern] EXISTING GRAVEL ACCESS ROAD
- [Symbol] EXISTING GATE
- [Symbol] EXISTING CHAIN LINK FENCE
- [Symbol] PROPOSED SLOPE MAX. 3:1 C/W EROSION CONTROL BLANKET
- [Pattern] AREA A
- [Pattern] PROPOSED SOIL DUMP AREA
- [Pattern] PROPOSED LANDSCAPING (GRASS)
- [Symbol] PROPOSED BOTTOM OF SLOPE



NOT FOR CONSTRUCTION

CAUTION
 THE POSITION OF ALL POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

JOB BENCH MARK
 CP IN UTILITY POLE ELEVATION = 111.79

TOPOGRAPHIC INFORMATION
 PART OF LOT 8, CONCESSION 4 (RIDEAU FRONT), GEOGRAPHIC TOWNSHIP OF NEPEAN, CITY OF OTTAWA.

Bearing Note
 Bearings hereon are grid bearings derived from the Can-Net Real Time Network and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

Elevation Notes
 Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978. (Monument No. 19770866)

REV	REVISION DESCRIPTION	DATE	BY	APPD
5	RE-ISSUED FOR SPA	05/03/24	AGJ	AA
4	ISSUED FOR SPA	23/06/23	AJ	AA
3	ISSUED FOR CLIENT REVIEW	20/10/22	AJ	AA
2	REVISED AS PER CLIENT COMMENTS	22/07/22	AJ	AA
1	ISSUED FOR REVIEW	24/05/22	AJ	AA



CLIENT
DRAIN-ALL LTD
 3385 HAWTHORNE ROAD, OTTAWA, ON.
 K1G 4G2 613.739.1070

exp.
 exp Services Inc.
 1-813-688-1899 | +1-613-225-7330
 3055 Queenensway Drive, Unit 100
 Ottawa, ON K2B 8H6
 Canada
 www.exp.com

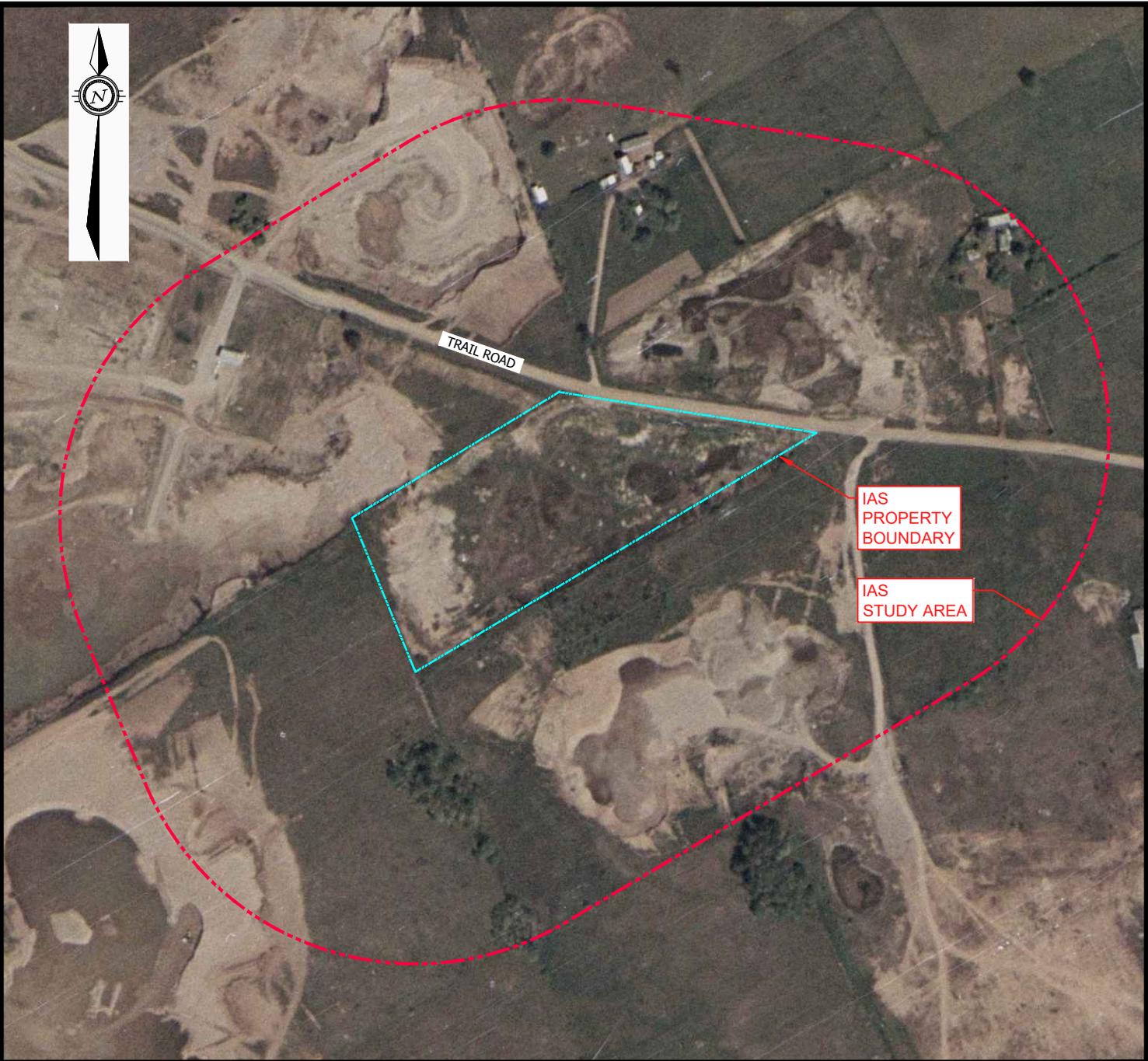
• BUILDINGS • EARTH & ENVIRONMENT • ENERGY •
 • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

DESIGN	PROJECT	PROJECT No.
AJ	ENGINEERING SERVICES FOR	OTT-21023795-AG
AJ	4380 TRAIL ROAD,	SURVEY FSD
AA	OTTAWA, ONTARIO.	DATE 27/04/2022
AA	ZONING/SITE PLAN	DRAWING No. C002

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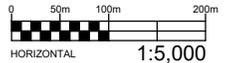
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Appendix D – Aerial Photographs



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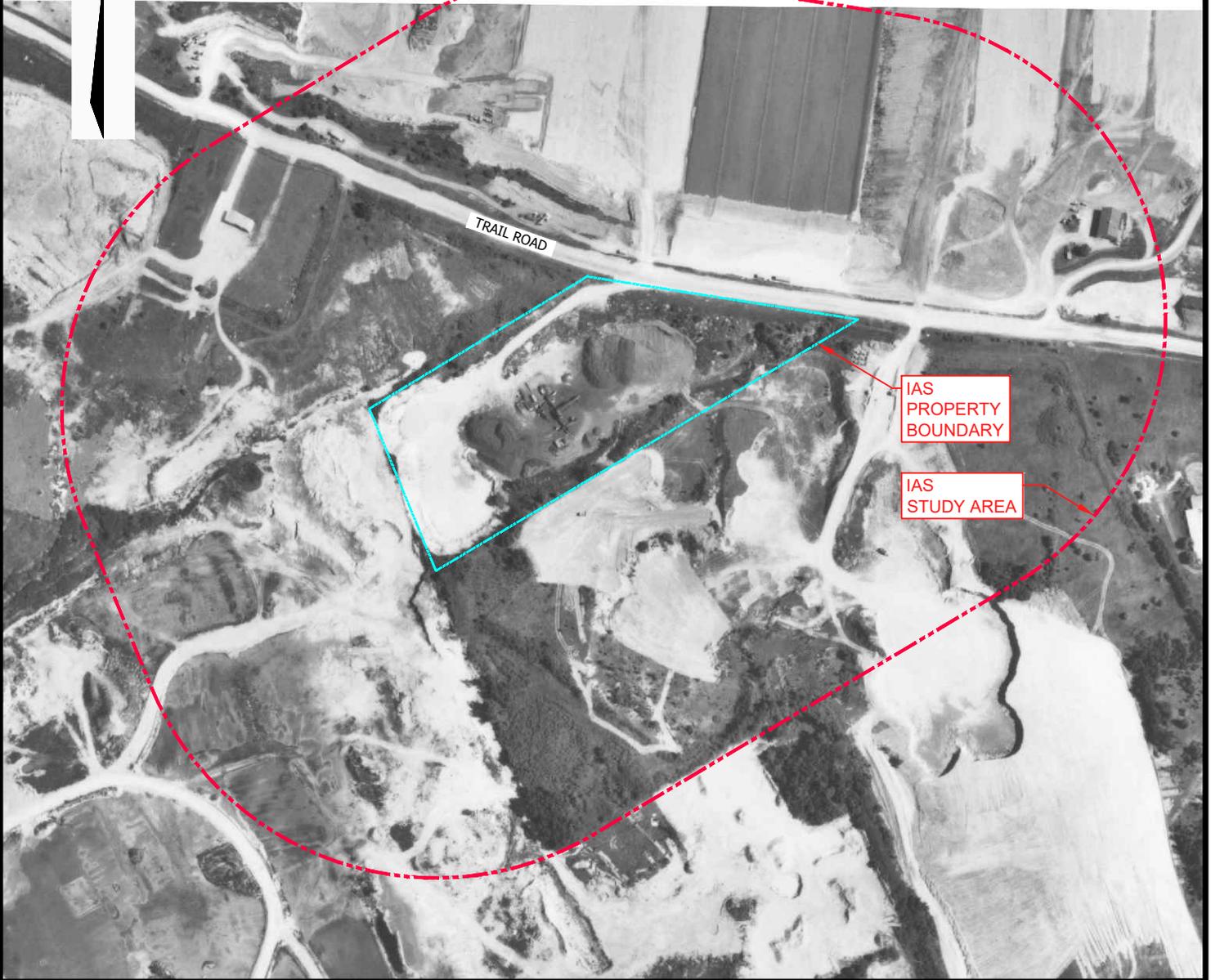
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-  STUDY AREA



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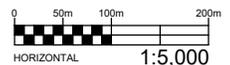
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DRAWN BY TM / AS		FIG D-1		

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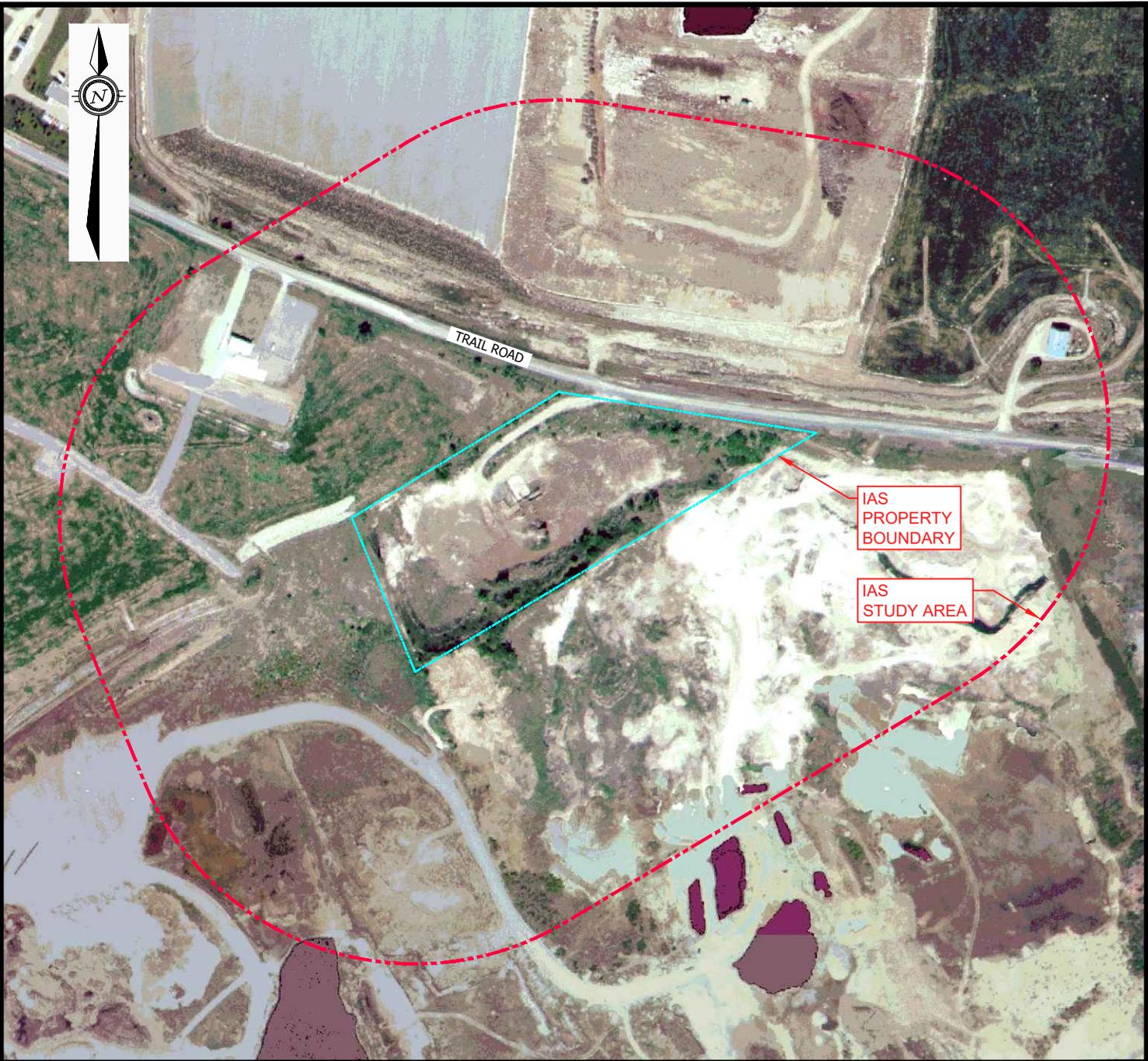


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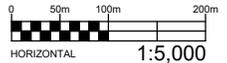
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TRAIL ROAD

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DATE	PROJECT:	project no.
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DESIGN		scale
CK / LW	TITLE:	1:5,000
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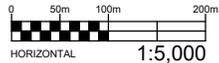


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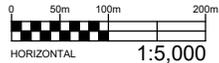
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DRAWN BY TM / AS				FIG D-5

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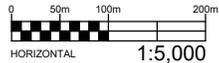


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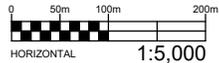


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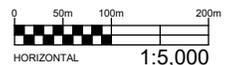
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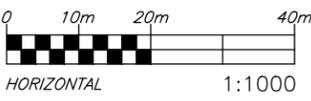
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Appendix E - Site Photographs



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	PHOTO KEY			FIG E-1		



Photograph 1 – Overview of site facing southwest



Photograph 2 -Overview of site facing northwest.



Photograph 3 – View of site facing northeast



Photograph 4 – View of site facing east.



Photograph 5 - View of site facing east



Photograph 6 - View of site facing north



Photograph 7 - View site facing southwest



Photograph 8 – View of site facing south



Photograph 9 – View of site facing southwest



Photograph 10 - View of site facing east along north property line



Photograph 11 – View of northwest property line



Photograph 12 - View of adjacent property to southeast

Appendix F - Curriculum Vitae

Greg Hunt, M.Eng., P.Eng.**Senior Rock Engineer****Professional Registrations**

- P.Eng. (ON)

Education + Training

- B. Eng., Carleton University, 1979. M.Eng., McGill University 1990

Affiliations + Memberships

- Professional Engineers Ontario

Languages Spoken

- English

Greg is a senior mining and geological engineer, actively involved on heavy construction and environmental projects. He is an experienced geotechnical and environmental engineer with an extensive soils and rock mechanics, engineering geology background. He is engaged in the analysis of earth and rock stability problems for diverse projects, underground and on surface. He is the principal engineer for numerous civil construction and mining projects involving hydro-geological, environmental, landfill and tailings disposal works. Greg has gained valuable experience within the areas of foundation technology, hydroelectric projects, bridges, waste management, underground planning, dam construction, blast design, rock foundations and tunnelling work. He has considerable project experience with backfill and dewatering systems, surface water control, hydrogeology and grouting. He has a published background in mining instrumentation, field and laboratory testing and numerical analysis techniques.

Greg Hunt, P.Eng. - *continued***Senior Rock Engineer**

Wabagishik Dam Rock Slope and Foundation Evaluation, Vale, Sudbury, Ontario

Cape Breton Coal Crown Pillar and Subsidence Study, Glace Bay, Nova Scotia

Mine Water Inflow Study, Garson Mine, Vale, Sudbury Ontario

Mine Closure Plan Certification, Redstone Mine, Northern Sun, Timmins, Ontario

Detour Mine, Stormwater Pond Water Balance, Detour Gold Corporation, Cochrane, Ontario

Moblan Open Pit Wall Design, DRA America, Chibougamau, Quebec

Slag Dump Rock Wall Evaluation, Smelter Complex, Vale, Sudbury, Ontario

Bell Creek Mine, Clay and Rock Dump Study, Goldcorp Inc. Timmins, Ontario

Victoria Mine Portal Excavation Blasting, KGHM, Sudbury, Ontario

Queмонт Crown Pillar Recovery, Freeze Wall Investigation, Rouyn Noranda, Quebec

Other Information**Employment History**

- EXP Services Inc., Senior Rock Engineer
Employment: 2017 to Present
 - Geotechnical rock mechanics for the Earth and Environmental Services department of EXP's Sudbury, Ontario office.

STATEMENT OF QUALIFICATIONS

Esher Planning Inc.

Melanie Horton, MCIP, RPP

Esher Planning Inc. has expertise in land use planning and resource management with extensive experience in aggregate resource planning. The firm is an associate member of the Ontario Stone, Sand & Gravel Association (OSSGA).

Ms. Melanie Horton is a Registered Professional Planner and is a member in good standing of the Ontario Professional Planners Institute and the Canadian Institute of Planners. She is past chair of the Natural Resource Working Group for the Ontario Professional Planners Institute (OPPI) and has represented Ontario Planners on a variety of Natural Resource Policy initiatives. Melanie has over 25 years of experience in Aggregate Resource Management and Planning, working in both the public and private sector. She has been coordinating applications for over twenty-five years for pits and quarries across the province.

Ms. Horton has served on numerous provincial advisory committees including the State of the Aggregate Resources Report, and the Aggregate Strategy Working Group.

Chris Kimmerly, M.Sc., P. Geo., QP_{ESA}

Manager - Senior Geoscientist

Professional Registrations

- Professional Geoscientist (Association of Professional Geoscientists of Ontario)
- Qualified Person (Ontario Ministry of Environment, Conservation & Parks)

Education + Training

- Master of Science (Geological Sciences), Brock University, 1993
- Bachelor of Science (Geological Sciences), Brock University, 1990
- 40-Hour Contaminated Site Health & Safety Training Course, Environment Canada/US EPA, 1997
- Asbestos Management & Abatement in Facilities (in accordance with Ontario Ministry of Labour O. Reg. 838/90), 1999
- Natural Attenuation for Remediation of Contaminated Sites, National Groundwater Association, 2002
- Site Specific Risk Assessments, 2003
- Project Management – Module 1, 2004, 2008
- Ontario Regulation 511/09 Education & Outreach Session, 2010
- Leadership Forum, Knightsbridge, 2010

Affiliations + Memberships

- Association of Professional Geoscientists of Ontario
- Ottawa Geotechnical Group

Languages Spoken

- English

Areas of Expertise

- Environmental Site Assessment
- Soil and Groundwater Remediation Design & Review
- Excess Soil Characterization and Management
- Terrain Analysis
- Risk Mitigation & Risk Communication
- Technical Peer Review

Chris Kimmerly has more than 30 years of environmental consulting experience, 29 of which have been with EXP. A graduate of Brock University with a Master of Science Degree in Geological Science, he is professional geoscientist who has progressively gained experience and responsibility from driller's helper, to field geologist, to project manager and currently to division manager. His technical experience includes managing, coordinating, and conducting environmental site assessments; groundwater sampling programs; soil and groundwater remedial action and risk mitigation plans; mineral aggregate assessments; hydrogeological and terrain analysis assessments; designated substances and hazardous materials surveys. Mr. Kimmerly also has extensive experience managing standing offer agreements for municipal and federal government clients.

Since 2003, he has managed the Environmental Science & Engineering Services Group for the Ottawa office of EXP. As Division Manager, his responsibilities include mentoring, market development, project management, budget control, technical review, administration, and staffing of the division which currently consists of 12 environmental engineers, hydrogeologists, geologists, scientists, and technicians.

Mr. Kimmerly has been a practicing Professional Geoscientist with the Association of Professional Geoscientists of Ontario (APGO) since 2002. Mr. Kimmerly served on council of the APGO between 2007 and 2013 and worked as Secretary/Treasurer between 2010 and 2013. Mr. Kimmerly is also registered with the Ministry of Environment, Conservation and Parks as a Designated Qualified Person (QP_{ESA}) under Ontario's "Brownfield" legislation.

Project Experience

Enbridge Inc. - Geotechnical, Hydrogeological and Soil Management Services, Crossings of Natural Gas Pipeline, Township of Eganville (2022)

Mr. Kimmerly is the Technical Lead and Qualified Person responsible for the assessment of excess soils which may be generated during a natural gas pipeline project. Duties include client liaison, oversight of water well survey, oversight of assessment of past use and evaluation of project with respect to O. Reg 406.

Chris Kimmerly, M.Sc., P. Geo.**Manager - Senior Geoscientist****Aecon Construction Ontario East - Albert/Queen/Slater/Bronson Integrated Road and Sewer Project, Ottawa, Ontario (2022)**

Mr. Kimmerly is the Technical Lead and Qualified Person responsible for the management of excess soils generated during the integrated road and sewer replacement project. Duties include client liaison, preparation of a soil management plan, coordination for registry of the project in accordance with Ont. Reg 406.

Aecon Construction Ontario East - Byron Avenue, Highcroft Avenue, and Athlone Avenue Integrated Infrastructure Replacement, Ottawa, Ontario (2022)

Mr. Kimmerly is the Technical Lead and Qualified Person responsible for the management of excess soils generated during the integrated road and sewer replacement project. Duties include client liaison, preparation of a soil management plan, coordination for registry of the project in accordance with Ont. Reg 406.

United Counties of Leeds and Grenville - Excess Soil Characterization and Management Plan and Environmental Activity and Sector Registry (EASR) Application for Proposed New Long-Term Care Building Maple View Lodge 746 County Road 42. Athens, Ontario (2022)

Mr. Kimmerly was the Technical Lead and Qualified Person responsible for the management of excess soils generated during construction of a new long-term care home. Duties include client liaison, preparation of a soil characterization report and soil management plan in accordance with Ont. Reg 406.

Prince Edward County - Environmental Services - Wellington Elevated Water Tank, Wellington, Ontario (2022)

Mr. Kimmerly was the Technical Lead and Qualified Person responsible for the management of excess soils generated during construction of a new elevated water tank. Duties include client liaison, preparation of an assessment of past use, soil characterization report and soil management plan in accordance with Ont. Reg 406.

Royal Military Colleges Museum Corporation - Environmental Investigations for the Royal Military College Museum Corporation, Kingston, Ontario (2022)

Mr. Kimmerly was the Technical Lead and Qualified Person responsible for the management of excess soils generated during construction of a new museum. Duties include client liaison, preparation of an assessment of past use, soil characterization report and soil management plan in accordance with Ont. Reg 406.

City of Belleville - Environmental and Geotechnical Investigations for the Reconstruction of Albion Street, Belleville, ON (2021)

Mr. Kimmerly was the Technical Lead and Qualified Person responsible for the management of excess soils generated during a road rehabilitation project in Belleville. Duties include client liaison, preparation of an assessment of past use, soil characterization report and soil management plan in accordance with Ont. Reg 406

City of Ottawa - Corporate Real Estate Office, Geotechnical and Environmental Services – Bob MacQuarrie Recreational Complex Skate Park, 1490 Youville Drive, Ottawa, Ontario (2018-2019)

In support of the construction of an outdoor skate park, EXP was retained to evaluate the geotechnical and environmental qualities of the soil that will be encountered during construction. The environmental component addressed excess soil management issues. Soil samples were collected and submitted for laboratory analysis of petroleum hydrocarbons (benzene, toluene, ethylbenzene, xylenes (BTEX) and petroleum hydrocarbon (PHC) fractions F1 to F4) and inorganic parameters (heavy metals, pH, electrical conductivity, and sodium adsorption ratio). As Technical Lead, Mr. Kimmerly was responsible for quality control/quality assurance and report review

City of Ottawa – Infrastructure Services Department, Phase I Environmental Site Assessment and Excess Soil Assessment, 960 Silver Street and Alexander Park, Ottawa, Ontario (2016)

Chris Kimmerly, M.Sc., P. Geo.

Manager - Senior Geoscientist

In support of the construction of an outdoor skating rink, EXP was retained to evaluate appropriate soil management options. The scope of work for the Excess Soil Assessment consisted of collecting representative soil samples and submitting them for laboratory analysis of PHC, BTEX, PAH, metals, pH, grain size, TCLP. As Project Manager and Technical Lead, Mr. Kimmerly's responsibilities included client liaison, project management; development and coordination of field work, data evaluation, report writing, development and/or evaluation of recommendations, technical review.

Public Works and Government Services Canada – Real Property Branch - Energy Services Acquisition Program (ESAP) Pipeline, Modified Phase II Environmental Site Assessment (2018-2019)

In support of the installation of a 2.1 km long heating and cooling pipeline between heating plants, EXP was retained to complete a geotechnical investigation and a modified Phase II ESA. The objectives of the investigation were to: i) determine if historical and current land uses of the stretch of roadway had contributed to adverse soil and groundwater conditions; and, ii) document the current subsurface environmental and geotechnical conditions that will likely be encountered during the pipeline excavation so that excess soil and groundwater management decisions can be developed. As Project Manager and Technical Lead, Mr. Kimmerly's responsibilities included client liaison, project management; development and coordination of field work, data evaluation, report writing, development and/or evaluation of recommendations, technical review.

Public Services and Procurement Canada Phase II Environmental Site Assess, East Block, Parliament Hill, 111 Wellington Street, Ottawa (2015 - 2016)

Project Manager and Technical Reviewer for environmental site assessment in support of long-term rehabilitation project of East Block on Parliament Hill. The objective of the investigation was to assess the environmental quality of the overburden soil and/or groundwater that may be encountered during the construction work such that excess soil and groundwater management plans could be developed. Project duties include client liaison; workplan preparation; attendance at meetings; budget, scope, schedule & quality control; risk communication; technical and quality review; reporting.

Additional recent projects related to excess fill/soil

- Excess Soil Assessment, K. Mulrooney Trucking Ltd, Roadway Improvement, Pine Street, Gananoque, Ontario (August 2020)
- In-situ Soil Sampling Program, K. Mulrooney Trucking Ltd, Roadway Improvement Hwy 33 (Collins Bay) to County Road 24 (Kingston), Kingston, Ontario (May 2020)
- Stockpile Sampling Program, EllisDon, Construction activities at the Carling Campus, 60 Moodie Drive, Ottawa, (June 2020)
- Stockpiled Soil Sampling Program, Pomerleau Construction, Trent-Severn Lock 1 (October 2020)
- Stockpiled Soil Sampling Program, Pomerleau Construction, Trent-Severn Lock 3 (September 2020)
- Soil Quality Assessment for Proposed, National Research Council, Parking Lot Upgrades, 2320 Lester Road, Ottawa, Ontario (August 2020)
- Soil Management Plan, PWGSC, Proposed Parkade Construction, Carling Campus, 60 Moodie Drive, Ottawa, (July 2020)
- Topsoil Sampling Program, Site Preparation Limited, Carling Campus, 60 Moodie Drive, Ottawa, Ontario (June 2020)
- Stockpile Soil Quality Assessment, CECCE, School Addition, 45 Johnson Drive, Trenton, Ontario (August 2020)
- Soil Quality Assessment, City of Ottawa, Stormwater Pond Expansion, 110 Iber Road, Ottawa, Ontario (July 2020)

Chris Kimmerly, M.Sc., P. Geo.**Manager - Senior Geoscientist**

- Soil Quality Assessment, Drew Harrison Haulage, Picton Heights Reservoir Watermain Improvements, Picton, Ontario
- • Excess Soil Assessment, George W. Drummond Limited, Construction of parking lot on Industrial Avenue, Ottawa (2018)
- Excess Soil Assessment, PWGSC, Prior to construction of new building, Tunney's Pasture, Ottawa, (2020)
- Excess Soil Assessment, Polane/Montfort HUB, Excess soil test before being imported to Mer Bleue Road site, Ottawa (2019 to 2020)
- Excess Soil Assessment, Pomerleau and Demo-Plus, Realignment of SJAM parkway, Ottawa, Ontario (2019)

Publications

- Damage Claims and Asbestos Concerns, Canadian Independent Adjuster, March 2000
- Environmental Awareness: A Financial Perspective Presentation to Business Development Bank of Canada – Ottawa Branch, November 2000
- Asbestos Concerns for Building Owners and Managers, Presentation to BOMEX 2001, September 2001

Employment History**EXP Services Inc., Manager & Senior Geoscientist, Environmental Science**

Employment: April 2011 – Present

Responsible for the management, business development, technical review, and mentoring of staff of twelve environmental professionals.

Trow Associates Inc., Manager & Senior Geoscientist, Environmental Science

Employment: 2003 - 2011

Responsible for the management, business development, technical review, mentoring of staff of twelve environmental professionals.

Trow Associates Inc., Project Manager & Geoscientist,

Employment: 1997 - 2003

Responsible for the management of projects, client liaison, data collection, compilation, interpretation and preparation of technical reports.

Oliver, Mangione, McCalla & Associates Ltd, Geoscientist

Employment: 1994 - 1997

Responsible for data collection, compilation, interpretation and preparation of technical reports.

Arcturus Environmental Ltd., Project Scientist

Employment: 1993 - 1994

Responsible for the collection and compilation of field and analytical data.