patersongroup remedial action plan

consulting engineers

to:	Richcraft Group of Companies - **Mr. Patrick Gaudreault** - pgaudreault@richcraft.com
re:	Environmental Remedial Action Plan **Proposed Residential Development - Trail's Edge: Phase 5 (North),** **Part of 3730 Innes Road, Ottawa, Ontario**
date:	November 23, 2021
file:	PE5000-RAP.01
from:	Nick Sullivan

Further to your request and authorization, Paterson Group (Paterson) has prepared a remedial action plan for the proposed residential development at the aforementioned property (the subject site).

The subject site is located on the west side of Mer Bleue Road, between Innes Road and Brian Coburn Boulevard, in the City of Ottawa, Ontario. The property currently consists of a combination of grassland, agricultural land, as well as light brush, and is situated within a municipal urban setting consisting of mixed residential and commercial land uses.

Environmental Site Conditions

In August 2020, Paterson completed a Phase I - Environmental Site Assessment (Phase I ESA) Update for the subject site. According to the historical information reviewed, the subject site has never been formally developed. A former snow disposal area was identified within the northwestern portion of the subject site. This activity was considered to represent an on-site PCA, resulting in an APEC with respect to the subject site.

The neighbouring properties have historically consisted of residential and commercial lands. No environmental concerns were identified with respect to the neighbouring properties.

In September and October 2020, a Phase II ESA was conducted for the subject site to address the aforementioned PCA considered to result in an APEC with respect to the subject site. The subsurface investigation consisted of drilling three boreholes throughout the subject site, all of which were equipped with groundwater monitoring wells, in addition to the direct sampling of surficial soils using a hand shovel.

A select number of soil samples were submitted for laboratory analysis of BTEX, PHCs, metals, SAR, and/or EC parameters. Based on the analytical test results, the levels of EC and SAR detected in the soil were in excess of the appropriate MECP Table 3 residential site condition standards selected for the subject site.

Groundwater samples were also recovered from the monitoring wells installed on-site and submitted for laboratory analysis of BTEX, PHC, metals, and chloride parameters. Based on the analytical results, no contaminated groundwater was identified on the subject site.

Based on the findings of the Phase II ESA, elevated levels of EC and SAR were identified within the soils on-site. Despite exceeding the MECP Table 3 residential and/or commercial standards, this material is deemed suitable for use as subgrade material for future roadways within the proposed subdivision development where salt will be applied. If the soil with the elevated EC and SAR levels cannot be reused on-site beneath future roadways, and no appropriate off-site reuse sites can be identified to accept this soil, then it will have to be disposed of at an approved waste disposal facility.

Please refer to the following section for further details on the recommended plan for site remediation.

Remedial Action Plan/Soil Quality Assessment

The suggested action plan consists of a generic approach, where the excavation and removal of site soils will be undertaken. The suggested action plan is as follows:

- ❏ The remediation program will consist of three excavations, placed within the identified areas of elevated EC and/or SAR levels, and extended up to a depth of 2.5 m below grade.

- ❏ Paterson personnel will be present on-site to monitor the excavation and removal of any impacted soils.

- ❏ Excavated soils will be screened using visual and olfactory observations as well as a portable soil vapour analyser. Field observations will be used in combination with the collection and analytical testing of confirmatory base samples for EC and SAR parameters.

- ❏ Any impacted soils identified will be placed in trucks and hauled to an approved waste disposal facility. A toxicity characteristic leaching procedure (TCLP) sample will be obtained and submitted for laboratory analysis prior to the transportation of any impacted soils to a licensed waste disposal site.

- ❏ Based on the findings of the Phase II ESA, the groundwater beneath the Phase II property is not contaminated. Groundwater is not expected to be encountered during the remedial program.

- ❏ Upon completion of the remedial program, a summary report will be prepared including our observations, findings, and analytical test results. This remediation report will be incorporated into our Phase II ESA for submission to the city.

- ❏ If the final excavation elevation extents beneath the under side of footing for any proposed structures, then the difference will be made up via the importation, placement, and compaction of engineered backfill material (Granular "B"). Any excavation space above the under side of footing can be backfilled using locally sourced material from Richcraft's neighbouring Trail's Edge sites. A separation barrier (Geotextile) should be placed above the engineered fill layer prior to the placement of any locally sourced fill material.

Quantities and Cost Estimate

Estimated quantities would be as follows:

- ❏ Excavated soil material . . . . . 450 m^3
- ❏ Disposal of impacted soil at an approved waste disposal facility . . . . . 900 mt
- ❏ Rock breaking . . . . . Not Anticipated
- ❏ Groundwater management and treatment . . . . . Not Anticipated
- ❏ Engineered backfill material (Granular "B") . . . . . Volume T.B.D.
- ❏ Locally sourced backfill material . . . . . Up to a Maximum of 450 m^3

The cost estimate for this approach will be based on the methodology described above, as well as detailed in the table enclosed.

We trust that this information satisfies your requirements.

Best Regards,

Paterson Group Inc

Nick Sullivan, B.Sc.

Mark D'Arcy, P.Eng.

Attachments

- Table 1 - Generic Approach for Remediation
- Soil Profile and Test Data Sheets
- Site Remediation Plan

Table 1
Generic Approach for Subject Site
Part of 3730 Innes Road, Ottawa, Ontario

Item and Estimated Quantity	Unit Rate	Estimated Cost
Remediation Contractor Estimated Incremental Costs		
Site preparation prior to commencing excavation operation including required safety signs and mobilization as well as cleaning and maintenance of roadway due to construction activities when removing contaminated soil.		
Removal of Impacted Soil Treatment		
Excavation of soil (approximately 450 m^3)		
Transportation and tipping fees for impacted soil at approved waste disposal facility (approximately 450 m^3 or 900 mt)		
Reinstatement of Ground Surface		
Engineered backfill (Granular "B") placed and compacted to a minimum of 95% S.P.M.D.D. (m^3). Volume to be determined based on final excavation elevation.		
Locally sourced backfill material from Richcraft's neighbouring Trail's Edge site (up to a maximum of 450 m^3)		
Contractor Sub-Total (excluding applicable taxes)		
Contingencies		
TOTAL (excluding applicable taxes)		

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Trails Edge, Phase 3 North - Innes Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5000

REMARKS

HOLE NO. BH 1-20

BORINGS BY Track-Mount Power Auger **DATE** September 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	89.22
Brown **SILTY CLAY,** some organics, trace gravel		AU	1				
0.60							
Stiff, brown **SILTY CLAY**		SS	2	100	10	1	88.22
1.68		SS	3	67	50+		
BEDROCK: Excellent quality, grey limestone		RC	1	100	94	2	87.22
		RC	2	100	89	3	86.22
3.96							
End of Borehole							
(GWL @ 1.60m - Oct. 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Trails Edge, Phase 3 North - Innes Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5000

REMARKS

HOLE NO. BH 2-20

BORINGS BY Track-Mount Power Auger **DATE** September 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.86
Brown **SILTY CLAY,** some organics, trace gravel		AU	1				
0.60							
Stiff, brown **SILTY CLAY**		SS	2	79	7	1	87.86
		SS	3	100	8	2	86.86
- grey by 2.3m depth							
2.59		SS	4	100	50+		
		RC	1	96	69	3	85.86
BEDROCK: Fair to excellent quality, grey limestone						4	84.86
		RC	2	100	93		
5.05						5	83.86
End of Borehole							
(GWL @ 1.57m - Oct. 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II - Environmental Site Assessment
Trails Edge, Phase 3 North - Innes Road
Ottawa, Ontario

DATUM Geodetic

FILE NO. PE5000

REMARKS

HOLE NO. BH 3-20

BORINGS BY Track-Mount Power Auger **DATE** September 28, 2020

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	88.90
Brown **SILTY CLAY,** some organics, trace gravel		AU	1				
0.60							
Stiff, brown **SILTY CLAY**		SS	2	100	9	1	87.90
		SS	3	100	7		
- grey by 2.0m depth						2	86.90
2.44		SS	4	100	50+		
		RC	1	100	93	3	85.90
BEDROCK: Excellent quality, grey limestone							
		RC	2	100	93	4	84.90
4.75							
End of Borehole							
(GWL @ 1.52m - Oct. 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

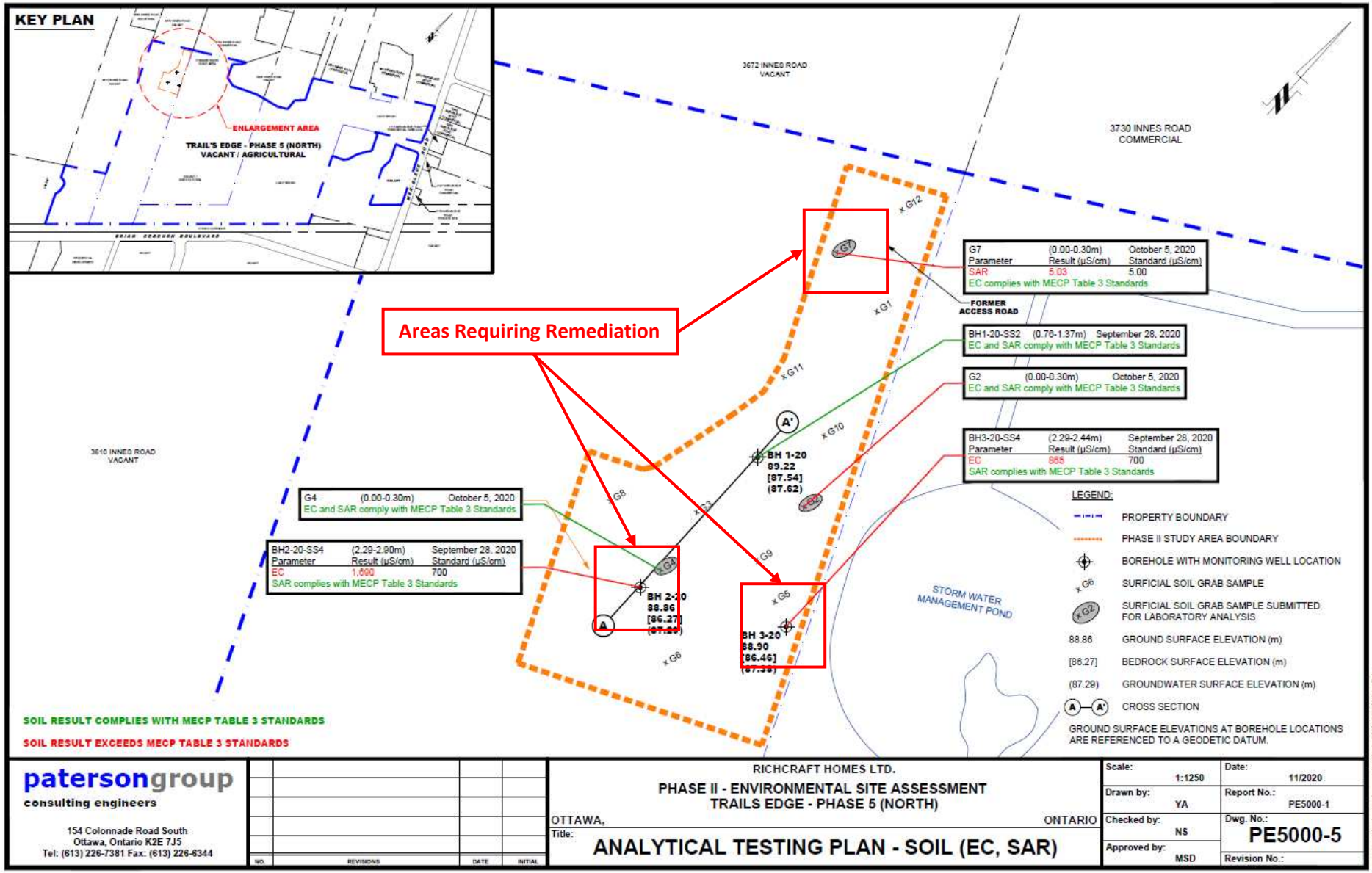
20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction



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NO.	REVISIONS	DATE	INITIAL

RICHCRAFT HOMES LTD.

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
TRAILS EDGE - PHASE 5 (NORTH)

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - SOIL (EC, SAR)

Scale: 1:1250	Date: 11/2020
Drawn by: YA	Report No.: PE5000-1
Checked by: NS	Dwg. No.: PE5000-5
Approved by: MSD	Revision No.:

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