PATERSON GROUP

remedial action plan

re: **Environmental Remedial Action Plan**
Proposed Development – Phase I-Building A - 1500 Merivale Road-Ottawa

to: Claridge Homes – **Mr. Vincent Dénommé** – vincent.denomme@claridgehomes.com

date: March 19, 2024

file: PE5066-MEMO.03

Further to your request and authorization, Paterson Group (Paterson) has prepared a remedial action plan (RAP) for the first phase of the proposed development located at the aforementioned site. It is our understanding that the proposed development consists of a 10-storey midrise residential building with an underground parking garage.

Environmental Site Conditions

Previous Phase I- and Phase II-Environmental Site Assessments (ESAs) have been completed for the larger parcel of land addressed 1500 Merivale Road, including the subject parcel of land which consists of the first development phase (referred to as Building A). The historical investigations were carried out others and Paterson. Paterson has most recently completed Phase I and Phase II-ESAs for the subject parcel of land, dated March 2024.

Based on the findings of the Phase I-ESA, several historical potentially contaminating activities (PCAs) resulted in 5 areas of potential environmental concern (APECs) on the subject parcel of land including the following:

- ❒ Potential former on-site automotive service garage on the southeastern portion of the site.
- ❒ A former heating oil underground storage tank adjacent to the former building.
- ❒ Fill material of unknown quality.
- ❒ Application of road salt.
- ❒ Former off-site automotive service garage on the adjacent property to the south.

A review of previous reports completed as part of the Phase I ESA identified known soil and groundwater contamination on the southern portion of the site.

A Phase II-ESA was recommended and carried out to further assess the APECs, to determine the extent of soil and groundwater impacts and to assess excess soil for potential off-site reuse.

Impacted Soil

Based on the findings of the most recent subsurface investigation in combination with historical information, soil contaminated with zinc, BTEX, PHC and PAH concentrations exceeding the MECP Table 3 Residential Standards, is present on subject parcel of land.

Impacted soil is expected to be limited to the southeastern portion of the site and does not extend to the bedrock.

Impacted Groundwater

Groundwater samples were recovered from monitoring wells installed by others as well as monitoring wells installed by Paterson during the most recent field program. Based on the findings of the analytical testing program, impacted groundwater is present on the southeastern portion of the site. The groundwater impacts may be associated with the former on-site UST and possible former on-site automotive service garage activities. The groundwater impacts are limited to the overburden on the southeastern portion of the site, within the property boundaries.

The approximate areas of soil and groundwater impacts are illustrated on the attached Analytical Testing Plans. Note that the area shaded on Drawing PE5066-11 – Analytical Testing Plan – Soil (BTEX, PHCs) also includes soil impacted with zinc and PAHs.

Remedial Action Plan Summary

The suggested remedial action plan consists of a generic approach, where excavation and disposal at an approved waste disposal facility would be undertaken during the redevelopment of the subject parcel of land.

The proposed residential development will require a Record of Site Condition (RSC) due to the change in land use. To meet the requirements of an RSC, the suggested remedial action plan is as follows:

- ❒ Existing groundwater monitoring wells are required to be decommissioned by a licensed well driller in accordance with Ontario Regulation 903.

- ❒ A remediation program using a full depth approach will be used and will involve excavation to depths up to 6m below the existing grade, to remove all zinc, BTEX, PHC and PAH impacted soil from the property. Prior to its off-site disposal leachate analyses of representative samples of contaminated soil will be completed in accordance with Ontario Regulation 347/558. One leachate sample may be required for each 2,500m^3 of impacted soil, depending on the requirements of the selected landfill.

- Excavated soil 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 analysis of verification samples to determine the excavation limits.

- Impacted soil will be placed in trucks and hauled to an approved waste disposal facility.

- Soil with no visual or olfactory signs of contamination will be screened, stockpiled, and sampled for possible reuse, in accordance with the sampling frequency outlined in O.Reg. 153/04, as amended and/or O.Reg. 406/19. If excavation is required outside of the proposed underground parking garage footprint, and soil sampled for possible reuse is deemed unacceptable, a select subgrade material will be imported for backfilling.

- Excess non-impacted soil to be removed from the property will be placed in trucks and hauled off-site for possible re-use as clean material. Excess soil is required to be handled in accordance with O.Reg. 406/19: On-Site and Excess Soil Management.

- All soil, including select subgrade material, brought to the subject property requires sampling in accordance with the sampling frequency outlined in O.Reg. 153/04, as amended.

- The excavation of impacted soil will remove some of the impacted groundwater. Impacted groundwater that cannot be managed by the excavation of soil can be removed by a licenced pumping contractor for off-site disposal. Alternatively, a portable treatment system could be installed to treat on-site accumulated groundwater by means of granular activated carbon. Groundwater treatment will continue until the on-site groundwater concentrations are compliant with the MECP Table 3 standards and/or City of Ottawa sewer use by-law.

- Prior to pumping 50,000 L/day of water, a permit to take water (PTTW) from the MECP is required.

- Prior to discharging groundwater to the municipal sewer system, an Approval or Agreement from the City of Ottawa Sewer Use Program is required. Testing, reporting, and discharge requirements need to be carried out in compliance with the agreement.

- A confirmatory soil sampling program will be completed to ensure that the site meets MECP Table 3 Residential soil standards.

- Post-remediation groundwater monitoring wells will be required to confirm groundwater quality. An initial sampling event followed by 2 quarterly sampling events, the first of which will be carried out at least 90 days following the completion of the groundwater remediation, will be required in accordance with O.Reg. 153/04.

- A remediation report will be prepared and appended to the Phase II-ESA report. An RSC conceptual site model will be developed and submitted to the MECP for acknowledgement.

We trust that this information satisfies your requirements.

Best Regards,

Paterson Group Inc.

Karyn Munch, P.Eng., QP_{ESA}

Attachments:

- Drawing PE5066-11 – Analytical Testing Plan – Soil (BTEX, PHCs)
- Drawing PE5066-15 – Analytical Testing Plan – Groundwater (BTEX, PHCs)

PARKLAND

Approximate extent of soil impacted with BTEX/PHC, PAH and/or zinc.

LEGEND:

SOIL RESULT COMPLIES WITH THE MECP TABLE 3 RESIDENTIAL STANDARDS

SOIL RESULT EXCEEDS THE MECP TABLE 3 RESIDENTIAL STANDARDS

- PHASE I, II AND RSC PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION BY OTHERS (PINCHIN ENVIRONMENTAL)
- MONITORING WELL LOCATION BY OTHERS (PINCHIN ENVIRONMENTAL)
- A—A' CROSS SECTION
- 94.95 GROUND SURFACE ELEVATION (m)
- [86.39] BEDROCK SURFACE ELEVATION (m)
- (91.94) GROUNDWATER SURFACE ELEVATION (m) (3 AND 4 JANUARY, 2024)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:500

0 5 10 15 20 25 30m

BH13-22-SS5 3.40-3.80m 28-Mar-13
PHCs comply with MECP Table 3 Residential Standards

BH6-24-SS2 0.76-1.37m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH6-24-SS3 1.52-2.13m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH6-24-SS5 3.05-3.66m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH6-24-SS7 4.57-5.18m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH6-24-SS9 6.10-6.71m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH7-24-SS2 0.76-1.37m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH7-24-SS3 1.52-2.13m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH7-24-SS4 2.29-2.90m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH7-24-SS6 3.81-4.42m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH7-24-SS8 5.33-5.94m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH8-24-SS2 0.76-1.37m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH8-24-SS3 1.52-2.13m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH8-24-SS5 3.05-3.66m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH8-24-SS7 4.57-5.18m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH9-24-SS2 0.76-1.37m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH9-24-SS4 2.29-2.90m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH9-24-SS6 3.81-4.42m 30-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH5-24-SS2 0.76-1.37m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH5-24-SS3 1.52-2.13m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH5-24-SS4 2.29-2.90m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH5-24-SS6 3.81-4.42m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH5-24-SS8 5.33-5.94m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

#1465 MERIVALE ROAD
COMMERCIAL

MW13-46-SS1 0.60-0.90m 06-Aug-13
BTEX & PHCs comply with MECP Table 3 Residential Standards

MW13-21-SS4 2.60-3.00m 28-Mar-13
BTEX & PHCs comply with MECP Table 3 Residential Standards

MW13-52-SS4 n/a 03-Oct-13
BTEX & PHCs comply with MECP Table 3 Residential Standards

MW13-45-SS3 1.8-2.20m 06-Aug-13

Parameter	Result(µg/g)	MECP(µg/g)
PHC F1	171	55
PHC F2	1270	98
PHC F3	1150	300

BTEX and remaining PHCs comply with MECP Table 3 Residential Standards

BH4-24-AU1 0.13-0.61m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH4-24-SS3 1.52-2.13m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH4-24-SS5 3.05-3.66m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH4-24-SS6 3.81-4.42m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH4-24-SS8 5.33-5.94m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

MW13-50-SS4 n/a 03-Oct-13
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH3-24-AU1 0.15-0.61m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH3-24-SS4 2.29-2.90m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH3-24-SS6 3.81-4.42m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH3-24-SS8 5.33-5.94m 29-Jan-24
BTEX & PHCs comply with MECP Table 3 Residential Standards

BH13-24-SS4 2.60-3.00m 28-Mar-13
PHCs comply with MECP Table 3 Residential Standards

MW13-44-SS4 2.60-3.00m 06-Aug-13
BTEX & PHCs comply with MECP Table 3 Residential Standards

MW13-23-SS4 2.60-3.00m 28-Mar-13

Parameter	Result(µg/g)	MECP(µg/g)
Ethylbenzene	8.46	2.0
m/p-Xylene	6.86	3.1
Xylenes, total	6.86	3.1
PHC F1	595	55
PHC F2	2890	98
PHC F3	2420	300

Remaining BTEX and PHCs comply with MECP Table 3 Residential Standards

BH13-51-SS4 n/a 03-Oct-13

Parameter	Result(µg/g)	MECP(µg/g)
PHC F2	387	98
PHC F3	315	300

BTEX and remaining PHCs comply with MECP Table 3 Residential Standards

BH13-49-SS4 n/a 03-Oct-13

Parameter	Result(µg/g)	MECP(µg/g)
PHC F1	131	55
PHC F2	1160	98
PHC F3	793	300

BTEX and remaining PHCs comply with MECP Table 3 Residential Standards

KIMWAY CRESCENT
MERIVALE ROAD
PART OF 1500 MERIVALE ROAD
GRASSED
FORMER HEATING OIL UNDERGROUND STORAGE TANK
CONCRETE SLAB
FORMER OIL / WATER SEPARATOR
GRAVEL
ASPHALTIC CONCRETE
#1486 MERIVALE RD. SWAN'S GARAGE

BH 6-24 94.50
BH 8-24 94.60
BH 9-24 94.15
BH 7-24 94.91 (93.35)
BH13-24
BH13-22
MW13-46 94.90 (93.40)
BH 5-24 94.88
MW13-23 94.87 (93.25)
MW13-21 94.91 (93.28)
MW13-45 94.91 (92.96)
MW13-52
MW13-44 94.45 (93.55)
BH 1-24 94.93 (92.57) [86.19]
BH 2-24 94.95 [86.39] (91.94)
BH 4-24 94.64 (92.50)
MW13-51 94.93 (93.36)
MW13-49
MW13-50 94.54
BH 3-24 94.62 (92.48)
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NO.	REVISIONS	DATE	INITIAL

CLARIDGE HOMES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1500 MERIVALE ROAD

OTTAWA, ONTARIO

Title: **ANALYTICAL TESTING PLAN - SOIL (BTEX, PHCs)**

Scale: 1:500	Date: 03/2024
Drawn by: YA	Report No.: PE5066-4
Checked by: JC	Dwg. No.: PE5066-11
Approved by: KM	Revision No.:

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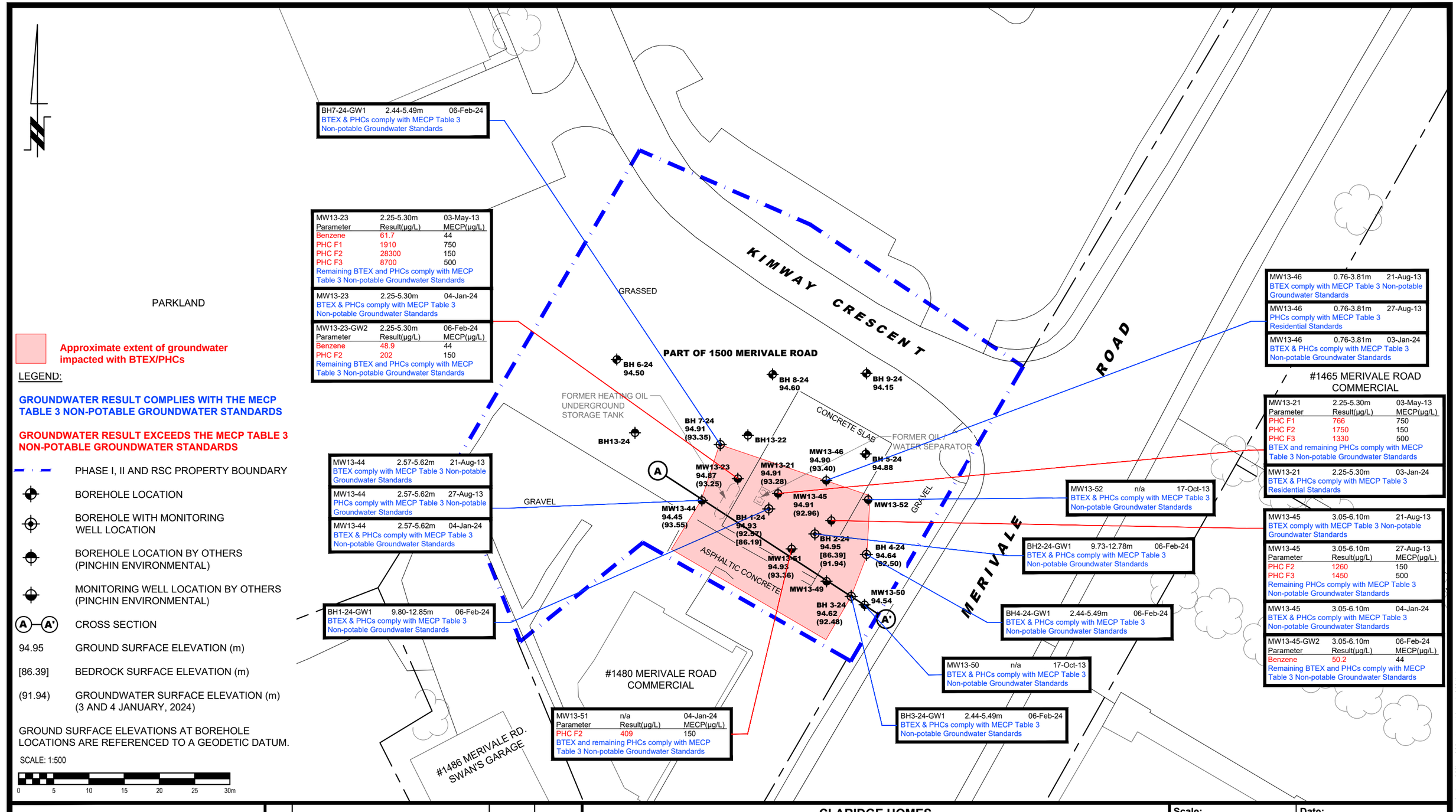

Approximate extent of groundwater impacted with BTEX/PHCs

LEGEND:

GROUNDWATER RESULT COMPLIES WITH THE MECP TABLE 3 NON-POTABLE GROUNDWATER STANDARDS

GROUNDWATER RESULT EXCEEDS THE MECP TABLE 3 NON-POTABLE GROUNDWATER STANDARDS

- PHASE I, II AND RSC PROPERTY BOUNDARY
- BOREHOLE LOCATION
- BOREHOLE WITH MONITORING WELL LOCATION
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0 5 10 15 20 25 30m

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NO.	REVISIONS	DATE	INITIAL

CLARIDGE HOMES

PHASE II - ENVIRONMENTAL SITE ASSESSMENT
PART OF 1500 MERIVALE ROAD
OTTAWA, ONTARIO

Title: **ANALYTICAL TESTING PLAN - GROUNDWATER (BTEX, PHCs)**

Scale: 1:500	Date: 03/2024
Drawn by: YA	Report No.: PE5022-4
Checked by: JC	Dwg. No.: PE5066-15
Approved by: KM	Revision No.:

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