JBPA Developments Inc.

Phase II Environmental Site Assessment – Revision 1
12-24 Hawthorne Avenue
Ottawa, Ontario

SDC1007

April 12, 2023

CM3 Environmental Inc.
5710 Akins Road Ottawa, Ontario K2S 1B8

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS

0 ppm	not detected
ACM	asbestos containing building materials
ANSI(s)	area(s) of natural and scientific interest
APEC(s)	area(s) of potential environmental concern
AST	aboveground storage tank
BFD	blind field duplicate
BH	borehole
BTEX	benzene, toluene, ethylbenzene, xylenes
CALA	Canadian Association for Laboratory Accreditation
CCC	CCC Geotechnical & Environmental Drilling Ltd.
CM3	CM3 Environmental Inc.
CSA	Canadian Standards Association
CSM	conceptual site model
ESA	environmental site assessment
g	gram
Ha	hectare(s)
Hawthorne	Hawthorne Avenue
HSVL	headspace vapour level
Kg	kilogram
Km	kilometre(s)
L	litre(s)
LDPE	low density polyethylene
LPH	liquid phase hydrocarbon
m	metre(s)
m arl	metres above reference level
m asl	metres above sea level
m bg	metres below grade
MDL	method detection limit
MECP	Ontario Ministry of the Environment, Conservation and Parks
mg	milligram
mL	millilitre
mm	millimetre
MW	monitoring well
N/S	not specified
NA	not applicable/not analysed
NV	no value
O.Reg.	Ontario Regulation
O.Reg. 153/04	Ontario Regulation 153/04, as amended
O.Reg. 903	Ontario Regulation 903, as amended

ODSs	ozone depleting substances
Paracel	Paracel Laboratories Limited
PCA(s)	potentially contaminating activity(ies)
PCBs	polychlorinated biphenyls
PHCs	petroleum hydrocarbons
PHCs F1-F4	petroleum hydrocarbons F1 to F4 fractions
PIN(s)	property identification number(s)
ppm	parts per million
QA	quality assurance
QA/QC	quality assurance and quality control
QC	quality control
QPESA	Qualified Person for ESAs per O.Reg. 153/04
RSC	Record of Site Condition
SCS	site condition standard(s)
site	12-24 Hawthorne Avenue
subject property(ies)	12-24 Hawthorne Avenue
UFFI	urea formaldehyde foam insulation
µg	microgram
UST	underground storage tank

1.0 EXECUTIVE SUMMARY

CM3 Environmental (CM3) was retained by JBPA Developments Inc. to conduct a Phase II Environmental Site Assessment (ESA) for the properties located at 12-24 Hawthorne Avenue, Ottawa, Ontario ("site" or "subject properties"). The Phase II ESA was completed in August 2022 for due diligence purposes in support of a potential real estate transaction. CM3 was requested to revise the Phase II ESA to satisfy the reporting format required by the City of Ottawa to support a Site Plan Control Application. The Phase II ESA was not completed in support of a record of site condition.

The Phase II ESA was completed under the supervision of Mr. Bruce Cochrane, P.Geo. from CM3 Environmental. Mr. Cochrane has over 30 years of experience in contaminated lands consulting.

The municipal addresses of the subject properties are 12-24 Hawthorne Avenue, Ottawa, Ontario. The legal description for the subject properties is Lots 2 & 3, Plan 220, Ottawa/Nepean and Lot 4, Part Lot 5, Plan 220, as in CR453033, S/T & T/W CR245018, Ottawa/Nepean, and Part Lot 5&6, Plan 220, as in N682862. The subject properties are in the City of Ottawa and the current land use zoning is Commercial/Mixed use zone Traditional Mainstreet Zone. The current owner of the subject properties is JBPA Developments Inc.

The subject properties were first developed in 1911 for residential use and have been used for residential purposes since development. The subject properties included two semi-detached two storey duplex style residences at 12-18 Hawthorne. The properties at 20 and 24 Hawthorne were vacant and undeveloped, previously used for residential purposes including a former semi-detached at 20 and 22 Hawthorne, and a single-family home at 24 Hawthorne. The subject property is rectangular in shape and is bounded by the Hawthorne to the north, residential properties on Graham Avenue to the south, and residential properties to the east and west. The total area of the subject properties is approximately 1445 square metres (1.4 hectares).

CM3 completed a Phase I ESA for the properties in February 2023 to support a City of Ottawa Site Plan Control Application. The Phase I ESA included a review of several environmental reports for 20-24 Hawthorne, prepared by CM3 for Zelma Palef Holdings Limited between 2017 and 2020. The reports were prepared in support of an environmental site assessment and remediation related to a fuel oil spill on the property.

The 2023 Phase I ESA identified six potentially contaminating activities (PCAs) at the subject properties and five PCAs in the study area. Four areas of potential environmental concern (APECs) were identified based on the evaluation of the PCAs. The APECs and contaminants of concern are summarized in the following table.

Areas of Potential Environmental Concern			
APEC	**Location**	**Cause of Concern**	**COCs**
1	West side of Unit 12.	PCA 2 – Current aboveground fuel storage tank.	BTEX, PHCs F1-F4
2	South-east corner of Unit 14.	PCA 3 – Former aboveground fuel storage tank.	BTEX, PHCs F1-F4
3	South-west corner of Unit 16.	PCA 4 – Former aboveground fuel storage tank.	BTEX, PHCs F1-F4
4	Nort-east corner of Unit 18.	PCA 5 – Current aboveground fuel storage tank.	BTEX, PHCs F1-F4

The findings of the Phase I ESA identified four areas of potential environmental concern on the subject properties due to historic and current land use at the site. The contaminants of concern (COCs) were identified as BTEX, and PHCs F1-F4, and potentially contaminated media included soil and groundwater. The PCAs and APECs could result in adverse environmental conditions at the subject properties. A Phase II ESA was required to characterize soil and groundwater conditions and assess the presence of contaminants of concern at the APECs.

Other findings that were identified by the Phase I ESA that may be of concern include:

- The possible presence of asbestos containing building materials (ACM) due to the age of the buildings;
- The possible presence of other designated substances including lead (in paint), mercury, and silica;
- The possible presence of polychlorinated biphenyls (PCBs) containing light ballasts;
- The possible presence of urea formaldehyde foam insulation (UFFI) due to the age of the buildings; and
- The storage and use of ozone depleting substances (ODSs) including new and used refrigerants.

A designated substance survey would be required to determine the presence of designated substances including, ACMs, lead, mercury, and silica. Additional testing would be required to confirm the absence of PCBs, UFFI, and mould in the buildings. It is recommended that government regulations and best management protocols be applied in the use and handling of ODSs to mitigate environmental risk.

The Phase II site investigation was completed in July 2022 and included the advancement of three boreholes and soil sampling to assess soil quality at the APECs. The boreholes were completed as monitoring wells to assess potential impacts to groundwater at the APECs and to determine ground water flow conditions at the properties. Selected soil samples were analyzed for the COCs at each APEC. Groundwater samples were collected from the newly installed monitoring wells and analyzed for the COCs at each APEC.

The soil profile at the subject properties was 0.1 m of topsoil overlying 1.0 m to 1.5 m of fine-grained laminated sand overlying a grey clay to a depth of 4.5 m bg. Bedrock was not encountered during the investigation. The July 29, 2022 water levels were between 97.80 m arl and 97.93 m arl, at an average elevation of 97.87 m arl (2.19 m bg). The overall groundwater flow was to the south, based on the above water level measurements.

The environmental condition of the subject property was evaluated with respect to the Ontario Ministry of Environment, Conservation and Parks Ontario Regulation 153/04 “Soil, Ground Water and Sediment standards for Use Under Part XV.1 of the Environmental Protection Act”. The soil and groundwater analytical results were compared to the Table 3: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition for residential property use and coarse textured soils.

The results of the soil analyses did not show the presence of any COCs at detectable concentrations. COCs were also not detected in any of the groundwater samples. The non-detectable results meet the Table 3 SCS. The Phase II ESA did not identify any soil or groundwater impacts related to the APECs at the properties.

2.0 INTRODUCTION

CM3 Environmental was retained by JBPA Developments Inc. to conduct a Phase II Environmental Site Assessment for the properties located at 12-24 Hawthorne Avenue, Ottawa, Ontario. The Phase II ESA was completed in August 2022 for due diligence purposes in support of a potential real estate transaction. CM3 was requested to revise the Phase II ESA to satisfy the reporting format required by the City of Ottawa to support a Site Plan Control Application. The Phase II ESA was not completed in support of a record of site condition.

2.1 Site Description

The municipal addresses of the subject properties are 12-24 Hawthorne Avenue, Ottawa, Ontario. The legal description for the subject properties is Lots 2 & 3, Plan 220, Ottawa/Nepean and Lot 4, Part Lot 5, Plan 220, as in CR453033, S/T & T/W CR245018, Ottawa/Nepean, and Part Lot 5&6, Plan 220, as in N682862. The properties identification numbers (PINs) are 04126-0012 (LT), 04126-0013 (LT) and 04126-0014 (LT). The subject properties are in the City of Ottawa and the current land use zoning is Commercial/Mixed use zone Traditional Mainstreet Zone. The location of the site is provided on **Figure 1**.

The subject property is rectangular in shape and is bounded by the Hawthorne to the north, residential properties on Graham Avenue to the south, and residential properties to the east and west. The total area of the subject properties is approximately 1445 square metres (1.4 hectares). Two semi-detached two storey duplex style residences were present at 12-18 Hawthorne, used as rental properties at the time of the investigation. The properties at 20 and 24 Hawthorne were vacant and undeveloped, previously used for residential purposes including a former semi-detached at 20 and 22 Hawthorne, and a single-family home at 24 Hawthorne. A site Plan is provided as **Figure 2**.

2.2 Property Ownership

CM3 was retained by Mr. John Bassi on behalf of JBPA Developments Inc. to conduct the Phase I ESA. The contact information for Mr. John Bassi is provided below:

Mr. John Bassi, President
JBPA Developments Inc.
107 Pretoria Ave
Ottawa, ON K1S1W8
Canada
613-695-6767

The current owner of the subject properties is JBPA Developments Inc.

2.3 Current and Proposed Future Uses

The current and past land uses were determined based on the historical records search, a review of historical aerial photographs, and site interviews completed as part of the Phase I ESA. The

subject property was first developed in 1911 for residential use and has been used for residential purposes since development and is currently used for multi unit residential. The proposed future property use is a multi-unit residential, as conveyed by JBPA Developments Inc.

2.4 Applicable Site Condition Standards

The environmental condition of the subject property was evaluated with respect to the Ontario Ministry of Environment, Conservation and Parks Ontario Regulation 153/04 “Soil, Ground Water and Sediment standards for Use Under Part XV.1 of the Environmental Protection Act”, dated April 15, 2011. The following site conditions were used in the selection of the appropriate MECP site condition standards (SCS) to assess the property:

- The property is more than 30 meters from a body of water;
- Bedrock is more than 2 meters from grade;
- The site and surrounding land use is considered to be residential;
- Water is supplied from a municipal source; and,
- Soils at the site are considered coarse textured.

The MECP Table 3: Generic Site Condition Standards for Shallow Soils in a Non-Potable Ground Water Condition for residential property use and coarse textured soils were used for the evaluation of the analytical results, based on the above.

3.0 BACKGROUND INFORMATION

3.1 Physical Setting

3.1.1 Water Bodies and Areas of Natural Significance

There are no water bodies on the subject properties. The Rideau Canal is approximately 70 m west of the subject properties and the Ottawa River is approximately 750 m east of the subject properties. A wetland, consisting of a swamp and marsh, was present approximately 250 m to the north (marsh) and 290 m south-east (swamp) of the subject properties. The water bodies are shown on **Figure 1**.

Areas of natural and scientific interest (ANSI) were not identified at the subject properties or within the phase I study area.

3.1.2 Topography and Drainage

The site is relatively flat lying at an elevation of approximately 71 meters above sea level (m asl). In general, the site slopes very gently downward to the west towards the Rideau Canal. The surrounding area slopes from west to east on the west side of the Rideau Canal and from east to west on the east side of Rideau Canal from approximately 70 m asl to 68 m asl.

Surface drainage at the subject properties is likely controlled by the surface coverings (asphalt, gravel, grass, and various types of vegetation) and site grading around the on-site structures. One storm drain catch basin is present on Hawthorne on the south side of the road next to 12 Hawthorne. The stormwater drainage is reported on GeoOttawa as being to the north-east along Hawthorne to the Rideau River. It is likely that most of the surface drainage on the properties is by overland flow north toward Hawthorne.

3.1.3 Geology

The surficial geology of the subject property was interpreted from the Ontario Geological Survey Surficial Geology of Southern Ontario (Miscellaneous Releases, 2010) and information collected as part of the Phase I ESA. The surficial geology was described as mainly glacial marine deposits of clay and silt. The primary surface soil at the site was described as clay and silt overlying bedrock.

The bedrock geology of the subject property was interpreted from the Ontario Geological Survey Bedrock Geology of Ontario (Miscellaneous Releases, 2011) and information collected as part of the Phase I ESA. Bedrock was described as shale, limestone, dolostone and siltstone of the Georgian Bay, Blue Mountain, and Billings Formations.

3.1.4 Wellhead Protection Area, Water Supply and Wells

The subject property is not within a City of Ottawa wellhead protection area and supply wells were not identified at the subject property. The site and surrounding properties are supplied potable

water by the City of Ottawa municipal drinking water system, based on available information. CM3 did not identify any wells within the Phase I study area that supply water used for human consumption or an agricultural use.

3.2 Past Investigations

The following reports were reviewed prior to the Phase II ESA:

CM3 Environmental. Phase I Environmental Site Assessment 12-24 Hawthorne Avenue Ottawa Ontario. February 7, 2023 Revision 2

CM3 completed a Phase I ESA in August 2022 in support of a real estate transaction. The Phase I ESA was revised and updated in February 2023 to support a City of Ottawa Site Plan Control Application. The Phase I ESA included a review of several environmental reports for 20-24 Hawthorne, prepared by CM3 for Zelma Palef Holdings Limited. The reports are dated from 2017 to 2020 and were prepared in support of an environmental site assessment and remediation related to a fuel oil spill on the property. CM3 obtained permission from Zelma Palef Holdings Limited to use the reports and rely on the information therein.

The 20-24 Hawthorne reports documented the environmental site assessment and remediation of the fuel spill and post remediation groundwater monitoring. The fuel spill was remediated by demolishing the buildings at 20 and 24 Hawthorne and completing a remedial excavation. The property was remediated, and all final soil sample and post remediation groundwater sample results met the applicable MECP SCS. Therefore, PCAs at 20-24 Hawthorne were not included in the findings of the 2023 Phase I ESA and were not considered APECs at the subject properties.

The 2023 Phase I ESA identified six PCAs at the subject properties and five PCAs in the study area. Four APECs were identified based on the evaluation of the PCAs. The APECs and contaminants of concern are summarized in the following table.

Table 1: Areas of Potential Environmental Concern

APEC	Location	Cause of Concern	COCs
1	West side of Unit 12.	PCA 2 – Current aboveground fuel storage tank.	BTEX, PHCs F1-F4
2	South-east corner of Unit 14.	PCA 3 – Former aboveground fuel storage tank.	BTEX, PHCs F1-F4
3	South-west corner of Unit 16.	PCA 4 – Former aboveground fuel storage tank.	BTEX, PHCs F1-F4
4	Nort-east corner of Unit 18.	PCA 5 – Current aboveground fuel storage tank.	BTEX, PHCs F1-F4

4.0 SCOPE OF THE INVESTIGATION

4.1 Overview of Site Investigation

The purpose of this Phase II ESA was to confirm or refute the presence of the contaminants of concern at the APECs. The Phase II was completed for due diligence purposes in support of a potential real estate transaction and a Site Control Plan Application and not in support of the filing of a RSC. The Phase II ESA was completed following the requirements of the Canadian Standards Association Standard Z769-00 (R2008) and in general accordance with O.Reg. 153/04. The scope of work for the investigation included:

- A preliminary site visit to assess property access and to confirm or identify the proposed borehole/monitoring well locations,
- The determination of the locations of all underground utilities by a third-party utility locator,
- The advancement of three boreholes completed as monitoring wells as close as physically possible to APECs 1,2, 3 and 4,
- The continuous collection of soil samples during the environmental drilling (where possible) and on-site field screening of soil samples for vapours with a combustible gas meter,
- The submission of one soil samples from each borehole (when possible) for laboratory analysis of contaminants of concern,
- The measurement of the depth to groundwater and possible presence of Liquid Phase Hydrocarbons (LPH) in all monitoring wells, and
- The collection of groundwater samples from the three newly installed monitoring wells for laboratory analysis of contaminants of concern.

4.2 Media Investigated

The Phase II ESA included the investigation of soil and groundwater at the site to address the APEC identified in the Phase I ESA. Surface water and sediments were not present on the site and were therefore not included in the investigation. Soil samples were collected during the advancement of eight boreholes. All boreholes were completed as monitoring wells for the collection of groundwater samples.

4.3 Phase I Conceptual Site Model

The subject properties at 12-18 Hawthorne were used for residential purposes at the time of the Phase I ESA. The properties at 20 and 24 Hawthorne were vacant but had been used for residential purposes up to 2020. The Rideau Canal is to the west and the Ottawa River is to the east, outside of the Phase I study area. The Phase I study area and subject properties are provided on **Figure 3**. The PCAs, and APECs are provided on **Figure 4** and **Figure 5**.

A Phase I conceptual site model (CSM) was developed based on the information collected as part of this investigation.

Potentially contaminating activities were identified on and off-site related to the historic and current land-use included two above ground storage tanks and unknown fill quality on-site and transformers use, automotive repairs, a gas station, and a dry cleaner off-site. The PCAs were evaluated with respect to type, elevation, distance, geology, and hydrogeology to determine if they were of environmental concern at the subject property. The 2016 fuel oil spill that occurred on the 20-24 Hawthorne properties was identified as a PCA in the historic records search but was not considered an environmental concern because it was remediated. Four APECs were identified related to the on-site fuel storage and are shown on **Figure 5**. The contaminants of concern are BTEX and PHCs F1-F4.

Underground services to the on-site buildings are limited to natural gas, sewer, and water supply lines between buildings and the services in the street and/or sidewalk. The presence of the underground utilities may influence groundwater flow in the immediate vicinity of the utility corridor, but do not likely effect on the overall groundwater flow at the properties. Therefore, potential subsurface contaminant distribution and transport along buried utilities would likely be limited to APECs and COCs near the utility.

The surficial geology in the Phase I study area consists of geological deposits of clay and silt. The primary surface soil at the site is described as clay and silt overlying bedrock. The bedrock in the subject properties consists of shale, limestone, dolostone and siltstone.

The inferred regional groundwater flow direction was north-east towards the Ottawa River. The site groundwater flow direction could not be determined based on the information gathered as part of this Phase I ESA.

A freedom of information request on the subject properties was submitted to the MECP. The records have not been received. Additional information that may affect the findings of the Phase I ESA and CSM could be the identification of additional PCAs and APECs at the subject properties.

4.4 Deviations From Sampling and Analysis Plan

No deviations from the sampling and Analysis Plan were required.

4.5 Impediments

Drilling could not be completed along the north-east property boundary due to the presence of overhead and underground utilities. The proposed borehole/wells were relocated further south between the driveway of 12 and 20 Hawthorne to maintain a safe working distance from the utilities.

5.0 INVESTIGATION METHOD

5.1 General

All work conducted as part of the site investigations was completed following standard operating procedures for environmental drilling and monitoring well installation, soil sampling, and groundwater monitoring and sampling.

5.2 Drilling and Excavating

A total of three boreholes (MW1 through MW3) were completed on July 15, 2022, by CCC Geotechnical & Environmental Drilling Ltd. (CCC) of Ottawa, Ontario, under supervision of CM3 personnel. The boreholes were advanced using a track mounted CME drill rig with split spoon sampling equipment for soil sampling and hollow stem augers to advance boreholes to maximum depth of 4.57 meters below grade (m bg). The boreholes were completed to assess soil and groundwater conditions in APECs 1,2, 3 and 4. Borehole/monitoring well locations are illustrated on **Figure 3**.

Soil samples were collected using 60 cm long, 5.1 cm diameter split spoon samplers, advanced below the lead auger into undisturbed soil. The hollow stem augers and split-spoon sampling equipment were washed and rinsed between each sample interval and borehole location to prevent cross-contamination. At each borehole location, soil samples were collected continuously every 0.60 m from grade, when soil conditions permitted.

5.3 Soil: Sampling

Soil samples were collected using a 60 cm long, 5.1 cm diameter split spoon sampler. A new pair of clean, disposal nitrile gloves was used for each spoon sample to manually remove the soil from the spoon. Soil samples were logged at the time of drilling for grain size, colour, moisture content, and visual or olfactory evidence of impacts. A portion of each sample was placed into a polyethylene bag for field screening of relative combustible organic vapours. The remainder of each sample was placed into the appropriate laboratory supplied sample containers for the required analyses, following MECP sampling protocols. The sample containers were placed into an iced chilled cooler pending submission to the laboratory for analysis. The soils recovered during the drilling generally consisted of gravel, sand, and clay (topsoil in some locations).

5.4 Field Screening Measurements

Field screening of the soil samples for relative combustible vapour concentrations was completed using an RKI Eagle combustible vapour meter, operated in methane elimination mode. The RKI Eagle detects combustible vapours (minimizing the influence from methane) and registers combustible vapours from 0 (i.e. not detected) to 10 000 parts per million (ppm). The RKI Eagle is calibrated weekly by CM3 using hexane calibration gas of known concentration. The equipment calibration is checked daily before use by measuring vapours in ambient background (upwind)

air. The RKI Eagle is maintained by an independent supplier on an as-needed basis or every three months at a minimum.

The bagged soil samples were allowed to equilibrate to ambient temperature prior to combustible vapour measurements. The vapour concentrations were measured and recorded from the bag sample headspace by inserting and sealing the intake probe of the vapour meter into the plastic bag. The highest vapour reading from each sample was recorded and the meter was allowed to zero following each reading by exposing the intake probe to the atmosphere.

The results of the combustible vapour analysis were used to confirm field observations with respect to the presence of petroleum hydrocarbons and to select soil samples for laboratory analysis. In general, the soil sample showing the highest relative vapour concentrations at each borehole location was selected for analysis.

5.5 Ground Water: Monitoring Well Installation

Boreholes MW1, MW2 and MW3 were completed as monitoring wells following the completion of the soil sampling and drilling. Monitoring wells MW1, MW2 and MW3 were constructed by CCC. Each well was constructed manually using flush-threaded schedule 40 PVC well screens and risers. To minimize the potential for cross contamination, all well materials were handled wearing a new pair of clean, disposal nitrile gloves for each installation.

Well construction consisted of 32 mm outside diameter, flush-threaded schedule 40 PVC well screens and risers. At each borehole, a 10-slot well screen was placed to intercept the water table to allow for the detection of LPH. A silica sand pack was placed around the outside of the well screen in the annular space of the borehole to a minimum of 0.3 m above the screened interval. A bentonite seal was placed above the sand pack to approximately 0.3 m bg. MW1 through MW3 were capped with lockable j-plugs and finished below grade in flush-mounted manhole protective casings set in concrete. The monitoring well construction details are provided in **Table 1** and on the borehole logs, **Appendix A**. The monitoring well locations are provided on **Figure 3**.

Monitoring wells were developed following installation to ensure that subsequent groundwater samples collected were representative of overburden groundwater conditions. Each well was developed using 3/8” outside diameter low density polyethylene (LDPE) tubing (dedicated to the well) and a peristaltic pump. Well development was accomplished by agitating the LDPE tubing and removing water from the wells at a rate fast enough to re-suspend and extract sediment from the bottom of the well, where present.

The volumes of water for well development were calculated based on post installation static water level measurements, the well depth and the volume of the well and borehole annulus. If possible, three standing water volumes were removed. If insufficient water was present to achieve the required volume, the well was purged dry. Qualitative observations regarding the purge water quality were recorded.

5.6 Ground Water: Field Measurement of Water Quality Parameters

Field measurement of groundwater quality was not completed as part of the Phase II ESA due to budget constraints. Qualitative observations with respect to the purge water quality were recorded at the time of well development and water sampling and included: turbidity; hydrocarbon odour; and hydrocarbon sheen.

5.6.1 LPH and Water Level Measurement

The depth to groundwater and presence of LPH was measured in all monitoring wells on July 29, 2022, using a Solinst® electronic oil/water interface meter. The depth to LPH (if present) and water were measured the nearest millimetre from the highest point of the well riser. The interface probe was cleaned and rinsed with distilled water between each well to prevent cross contamination.

5.6.2 Ground Water: Sampling

Groundwater samples were collected from monitoring wells MW1, MW2 and MW3 on July 29, 2022. Prior to sampling, each well was purged to remove stagnant water from the well and surrounding annulus and to obtain samples that were representative of formation groundwater. Purging and sampling was conducted using a peristaltic pump to collect samples that were free of suspended fine-grained particles (which can sorb otherwise immobile contaminants) and to minimize the potential loss of any volatile compounds due to agitation. Water samples were collected from the pump outlet into the appropriate laboratory supplied sample containers following MECP sampling protocols. To minimize the potential for cross-contamination, all sampling tubing was dedicated to each well, and a new pair of clean, disposal nitrile gloves was used for each well. The groundwater samples were placed into an iced chilled cooler pending submission to the laboratory for analysis.

5.7 Analytical Testing

Soil and groundwater samples selected for analysis were submitted to Paracel Laboratories Limited of Ottawa, Ontario. Samples were submitted within 24 hours of collection for regular turnaround. Soil samples MW1A3, MW2SA5 and MW3SA4 were analysed for BTEX and PHCs F1-F4. Groundwater samples MW1, MW2 and MW3 were analysed for BTEX and PHCs F1-F4. Soil and groundwater samples were collected following MECP sampling protocols and industry accepted standard operating procedures. All samples were collected in the appropriate clean, laboratory supplied samples containers for the requested analyses. Soil samples were placed in a 40 mL vial with methanol preservative for BTEX and PHCs F1 analysis, and a 250 mL amber glass jar for PHCs F2-F4 analysis. Groundwater samples were placed in three 40 mL vials for BTEX and PHCs F1 analysis, and one 500 mL glass bottle for PHCs F2-F4 analysis.

5.8 Residue Management Procedures

All residual soil from the drilling and soil sampling operations, water from the cleaning of the sampling equipment and purge water from well development and sampling were stored on-site in sealed drums pending disposal.

5.9 Elevation Surveying

The locations of all newly installed boreholes/monitoring wells were referenced to existing site buildings and structures. The ground surface and monitoring well top of pipe elevations were referenced to the top of the well pipe at monitoring well MW1, at an arbitrary elevation of 100 m above reference level (m arl), using a TopCon AT-B4 automatic level. The ground surface and top of pipe elevations are included in **Table 1** and on the borehole logs, **Appendix A**.

5.10 Quality Assurance and Quality Control Measures

CM3 followed a quality assurance and quality control (QA/QC) program to ensure that the results of the Phase II ESA were representative of site conditions. The QA/QC program included general field procedures to maintain sample integrity. The general field QA/QC procedures included, but were not limited to:

- A new pair of disposable nitrile gloves was used for each sample collected;
- Sampling equipment was either single use or was dedicated to a specific location (i.e. LDPE tubing and foot valves for monitoring well sampling);
- Equipment that came into contact with the media to be collected (interface probe, stainless-steel trowel, etc.) was decontaminated between each monitoring location or sample;
- Clean, laboratory prepared sample containers containing the required preservatives were obtained from the laboratory for the proposed analyses;
- Sample containers were labelled prior to sample collection;
- Samples were placed in the appropriate sample containers for the selected analyses, following CM3 standard operating procedures and MECP protocols;
- Immediately following collection, all samples were stored in laboratory supplied coolers with the appropriate packing materials and ice packs, pending shipment to the laboratory; and
- Chain of Custody forms with CM3 contact information, date sampled, sample matrix, number and type of containers, and requested analyses travelled with all samples delivered to the laboratory for analysis.

All samples collected by CM3 were given unique sample identification and field staff recorded the location and identification of each sample collected using field logs and/or notebooks. Chain of Custody forms were filled out on site and travelled with all samples placed in coolers delivered to the laboratory for analysis. Each Chain of Custody included the CM3 contact information, date sampled, sample matrix, number and type of containers, and requested analyses.

5.10.1 Laboratory QA/QC

Paracel is a Canadian Association for Laboratory Accreditation Inc. (CALA) accredited laboratory that uses Ministry of Environment recognized methods to conduct analyses and follows an in-house QA/QC program. Paracel employs method blanks, control standard samples, certified reference material standards, method spikes, replicates, duplicates and instrument blanks as part of their internal QA/QC programs. The results of the laboratory QA/QC are reported in the laboratory certificates. If the internal QA/QC criteria are not met, the laboratory either re-analyses the affected samples or qualifies the results.

6.0 REVIEW AND EVALUATION

6.1 Geology

The site stratigraphy was determined based on the borehole drilling and previous investigations at 20-24 Hawthorne. The soil profile was determined to be 0.1 m of topsoil overlying 1.0 m to 1.5 m of fine-grained laminated sand overlying a grey clay to a depth of 4.5 m bg. Bedrock was not encountered during the investigation. The stratigraphy is provided on the borehole logs, **Appendix A**.

The Phase II ESA included the investigation of the surficial unconfined overburden aquifer. The unconfined aquifer was selected for investigation due to the COCs, contaminant release mechanisms, physical properties of the contaminants, and the depth to the water table.

6.2 Ground Water: Elevations and Flow Direction

The depth to water and presence of LPH was measured in monitoring wells MW1 through MW3 on July 29, 2022, **Table 2**. All monitoring wells were screened in the unconfined overburden aquifer, due to the depth of the water table. LPH was not measured in any of the wells during the monitoring event.

The groundwater elevations were determined based on the monitoring well top of well pipe elevations and the measured depth to water from the top of pipe. The July 29, 2022 water levels were between 97.80 m arl and 97.93 m arl, at an average elevation of 97.87 m arl (2.19 m bg). The overall groundwater flow was to the south, interpreted from the July 29, 2022 groundwater elevations, **Figure 6**.

The groundwater flow at the site may be influenced by the presence of fill (higher permeability than the native soil) used in the development of the property or imported fill for the backfilling of the excavation at 20-24 Hawthorne. Groundwater flow may also be influenced by the presence of drains under buildings and active or abandoned underground utilities (i.e., hydro, water, sewer, fibre optic). Additional water level monitoring would be required to assess potential seasonal variations of groundwater flow.

6.3 Ground Water: Hydraulic Gradients

6.3.1 Horizontal Gradients

Horizontal hydraulic gradients were determined based on the July 29, 2022 water levels and inferred groundwater flow direction. The hydraulic gradient in the surface fill/overburden was approximately 0.03 m/m toward the south. Additional water level monitoring would be required to assess potential seasonal variations of groundwater flow and hydraulic gradients.

6.3.2 Vertical Gradients

All monitoring wells were screened in the surface fill/overburden, and vertical hydraulic gradients could not be determined. However, it is suspected that the vertical gradients are predominantly downward. The observed water levels at the site are likely within an unconfined overburden aquifer and the water table likely fluctuates across within the overburden. Multi-level monitoring wells would be required to confirm the vertical gradients at the site and seasonal groundwater monitoring would be required to determine the variations in the water table.

6.4 Fine-Medium Soil Texture

The soils observed in the field at the time of sampling were predominantly described as coarse-grained and soil grain size analysis was not completed as part of the Phase II ESA.

6.5 Soil: Field Screening

The of combustible organic vapour concentrations on soil samples from MW1 were between 20 ppm and 30 ppm. Soil sample vapour concentrations from MW2 were 0-40 ppm and vapour concentrations from MW3 were 120-150 ppm. No field evidence of soil impacts was observed by CM3 personnel. Borehole sample combustible vapour concentrations are included on the borehole logs, **Appendix A**.

6.6 Soil Quality

A total of three soil samples from boreholes MW1 through MW3 were submitted for laboratory analysis of BTEX and PHCs F1-F4. The soil sample analytical results are summarized in **Table 3**. The borehole soil sample locations and soil quality are provided on **Figure 7**. The soil sample laboratory reports are provided in **Appendix B**.

BTEX and PHCs F1-F4

Soil samples MW1SA3, MW2SA5 and MW3SA4 were submitted for analysis of BTEX and PHCs F1-F4. The analytical results indicated that BTEX and PHCs F1-F4 were non-detectable in all soil samples, and met the MECP Table 3 SCS.

6.7 Ground Water Quality

Groundwater samples were collected from monitoring wells MW1, MW2 and MW3 for analysis of BTEX and PHCs F1-F4. The groundwater sample analytical results are summarized in **Table 4**. The monitoring well locations and groundwater quality are provided on **Figure 8**. The groundwater sample laboratory reports are provided in **Appendix B**.

BTEX and PHCs F1-F4

Groundwater samples MW1, MW2 and MW3 were submitted for analysis of BTEX and PHCs F1-F4. The analytical results indicated that BTEX and PHCs F1-F4 were non-detectable in all groundwater samples, and met the MECP Table 3 SCS.

6.8 Quality Assurance and Quality Control Results

6.8.1 Field QA/QC

Filed duplicates were not collected during the Phase II ESA, due to budgetary constraints. However, all samples were collected following industry protocols and CM3's internal QA/QC procedures. All samples were received by the laboratory withing the specified holding time for the requested analyses. The laboratory did not identify any samples that did not meet the appropriate protocols with respect to container type, preservation method, or storage requirement.

6.8.2 Laboratory QA/QC

The laboratory employs method blanks, control standard samples, certified reference material standards, method spikes, replicates, duplicates and instrument blanks as part of their internal QA/QC programs. The results of the laboratory QA/QC are reported in the laboratory certificates. If the internal QA/QC criteria are not met, the laboratory either re-analyses the affected samples or qualifies the results.

The method quality control blanks, method spikes and laboratory duplicate results reported as part of the laboratory QA/QC measures were within the laboratory accepted criteria. No qualifiers were provided for any of the soil or groundwater analyses. The laboratory QA/QC results for the soil and groundwater analyses are provided in the laboratory reports, **Appendix B**.

6.9 Phase II Conceptual Site Model

6.9.1 Areas Where Potentially Contaminating Activity Has Occurred

Potentially contaminating activities have occurred on site, including a fuel storage tanks in the buildings at 12 and 18 Hawthorne and former fuel storage tanks at 14, 16, 20 and 22 Hawthorne. Off site PCAs included historic and current fuel storage tanks and automobile repair garages, to the east, west and south, a former rail line to the north, former dry-cleaner to the east and transformers to the west and southwest of the subject property.

6.9.2 Areas Of Potential Environmental Concern

Four APECs were identified on the subject property based on the evaluation of the PCAs. The contaminants of concern included BTEX and PHCs F1-F4. The APECs are described in the following table and are shown on **Figure 5**.

Areas of Potential Environmental Concern			
APEC	**Location**	**Cause of Concern**	**COCs**
1	West side of Unit 12.	PCA 2 – Current aboveground fuel storage tank.	BTEX, PHCs F1-F4
2	South-east corner of Unit 14.	PCA 3 – Former aboveground fuel storage tank.	BTEX, PHCs F1-F4
3	South-west corner of Unit 16.	PCA 4 – Former aboveground fuel storage tank.	BTEX, PHCs F1-F4
4	Nort-east corner of Unit 18.	PCA 5 – Current aboveground fuel storage tank.	BTEX, PHCs F1-F4

6.9.3 Subsurface Structures and Utilities

Underground utilities to the on-site building included natural gas from Hawthorne to the north of the building. Water and sanitary sewer also enter the buildings from the north side along Hawthorne. The presence of underground utilities may influence groundwater flow in the immediate vicinity of the utility corridor and may affect the overall groundwater flow at the property. Potential subsurface contaminant distribution may be influenced by the presence of underground utilities.

6.9.4 Physical Setting

6.9.4.1 Stratigraphy

The site investigation included the overburden at the property, from grade to the maximum depth of investigation at 4.57 m bg. The site stratigraphy consisted of 0.1 m of topsoil overlying 1.0 m to 1.5 m of fine-grained laminated sand overlying a grey clay to a depth of 4.5 m bg. The stratigraphy is provided on the borehole logs, **Appendix A**.

The bedrock geology of the subject property was interpreted from the Ontario Geological Survey Bedrock Geology of Ontario (Miscellaneous Releases, 2011) and information collected as part of the Phase I ESA. Bedrock was described as shale, limestone, dolostone and siltstone of the Georgian Bay, Blue Mountain, and Billings Formations.

6.9.4.2 Hydrogeological Characteristics

The surficial unconfined overburden bedrock aquifer was investigated to a depth of 4.57 m bg. The overall groundwater flow was to the south. The groundwater elevations, contours and flow are shown on **Figure 6**.

Horizontal gradients were 0.03 m/m toward the south. All wells were screened within the same hydro stratigraphic unit and vertical hydraulic gradients could not be determined. It is assumed that vertical gradients at the site are downward.

6.9.4.3 Depth to Bedrock

The boreholes were advanced to a maximum depth of 4.57 m bg. Bedrock was not encountered during this investigation. The depth to bedrock at in the Phase I study area was 27.0 m bg to 40.7 m bg, based on the borehole records obtained in the Phase I ESA.

6.9.4.4 Depth to Water Table

The water table was at an average elevation of 97.87 m arl (2.19 m bg), based on the July 2022 monitoring event.

6.9.4.5 Application of Sections 35, 41 and 43.1 of O.Reg. 153

Section 35 of O.Reg. 153, Non-potable site condition standards, are applicable to the subject property based on the following:

- The subject properties are not in a designated wellhead protection area.

Section 41 of O.Reg. 153, Site Condition Standards, Environmentally Sensitive Areas, does not apply to the subject properties based on the following:

- the subject properties:
    - are not within an area of natural significance,
    - do not include or is adjacent to an area of natural significance,
    - do not include land within 30 metres of an area of natural significance,

Section 43.1 of O.Reg. 153, Site condition standards, shallow soil property or water body, is not applicable to the subject property base don the following:

- The subject properties are not within 30 m of a water body.

6.9.4.6 Excess Soil at the Subject Property

Soil was not brought to the subject property and excess soil was not generated during this Phase II ESA. Soil was likely imported during the development of the property. Imported fill was used in the backfilling of the remedial excavation at 20-24 Hawthorne, prior to undertaking this Phase II ESA. The fill met the applicable SCS for use at the property as conveyed in previous environmental reports.

6.9.4.7 Proposed Development

It was reported that the proposed development of subject property includes a multi-unit residential building. The proposed development plan was not provided, but it is anticipated that the development will include below grade parking and common areas and will be serviced by municipal water and sewer.

6.9.5 Environmental Conditions

6.9.5.1 Areas Where Contaminants are Present

The results of the soil and groundwater analyses did not show the presence of any contaminants of concern at concentrations above the MECP Table 3 SCS. The maximum soi land groundwater BTEX and PHCs F1-F4 concentrations are provided on **Table 5**.

6.9.5.2 Description of Areas Where Contaminants Are Present

Contaminants were not identified at the subject properties at any of the borehole/monitoring well locations.

6.9.5.3 Distribution of Contaminants

Soil

The results of the soil analyses did not show the presence of any contaminants at concentrations above the MECP Table 3 SCS.

Groundwater

The results of the groundwater analyses did not show the presence of any contaminants at concentrations above the MECP Table 3 SCS.

6.9.5.4 Contaminant Discharge

The soil and groundwater analytical results suggest that contaminant discharge has not occurred at the subject properties.

6.9.5.5 Migration of Contaminants

Contaminants of concern were not present in the areas of investigation. It is likely that any migration would be to the south, with groundwater flow.

6.9.5.6 Climatic and Meteorological Conditions

The Phase II investigation was completed in the summer, and it is anticipated that the measured water levels were relatively low. Snow melt or seasonal precipitation may result in fluctuations in the groundwater levels within the overburden, that may result in mobilization and migration of contaminants.

6.9.5.7 Vapour Intrusion

The subject property currently includes two residential buildings at 12-18 Hawthorne. The proposed development will likely include below grade structures and underground services. Vapour intrusion into basements and underground structures may occur but is not a concern

based on the absence of COCs in the areas of investigation. The potential for vapour intrusion can be mitigated at the time of development.

6.9.5.8 Lateral and Vertical Extents of Contamination

Contaminants of concern were not present in the areas of investigation.

6.9.6 Contaminant Transport and Exposure

Contaminants of concern were not present in the areas of investigation. Therefore, the release mechanisms, transport, receptors, and exposure are not applicable.

7.0 CONCLUSIONS

CM3 Environmental was retained by JBPA Developments Inc. to conduct a Phase II Environmental Site Assessment for the properties located at 12-24 Hawthorne Avenue, Ottawa, Ontario. The purpose of the Phase II ESA was to assess the presence of potential contaminants of concern related to Areas of Potential Environmental Concern identified in the CM3 Phase I ESA report "*Phase I Environmental Site Assessment 12-24 Hawthorne Avenue, Ottawa Ontario"* dated June 30, 2022. The work was completed in support of a real estate transaction and a City of Ottawa Site Control Plan Application.

The Phase II ESA included the advancement of three boreholes completed as monitoring wells the to assess the soil and groundwater conditions in areas of potential environmental concern at the site. The results of the Phase II ESA are summarized as follows:

Site Characterization

- The soil profile was determined to be 0.1 meters of topsoil overlying 1.0 to 1.5 meters of fine-grained laminated sand overlying a grey clay to a depth of 4.5 meters. Bedrock was not encountered.
- LPH was not present in any monitoring wells during groundwater monitoring.
- The depth to groundwater was between 97.80 m arl and 97.93 m arl, at an average elevation of 97.87 m arl (2.19 m bg).
- Groundwater flow was to the south.

Soil Impacts

- Three soil samples were analysed for BTEX and PHCs F1-F4,
    - BTEX and PHCs were not detected in any of the samples, meeting the MECP Table 3 SCS.

Groundwater Impacts

- Three groundwater samples were analysed for BTEX and PHCs F1-F4,
    - BTEX and PHCs were not detected in any of the samples, meeting the MECP Table 3 SCS.

The Phase II ESA did not identify any soil or groundwater impacts related to the APECs at the properties.

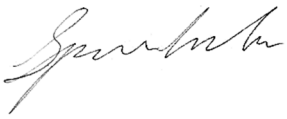
7.1 Signatures

This Phase II ESA was completed under supervision of Mr. Bruce Cochrane, P. Geo. of CM3 Environmental Inc. Mr. Cochrane is a Qualified Person as defined in O.Reg. 153/04 and confirms that this report includes all findings and conclusions of the Phase II ESA.

We trust that the above is satisfactory for your purposes at this time. Please feel free to contact the undersigned if you have any questions.

Yours sincerely,

CM3 Environmental Inc.



Spencer Cochrane
Environmental Technician

Bruce Cochrane P.Geo., QP, EP
Principal

8.0 LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by CM3 Environmental Inc. for JBPA Developments Inc. It is intended for the sole and exclusive use of JBPA Developments Inc., its affiliated companies and partners and their respective insurers, agents, employees and advisors. Any use, reliance on, or decision made by any person other than JBPA Developments Inc. based on this report is the sole responsibility of such other person. CM3 Environmental Inc. and JBPA Developments Inc. make no representation or warranty to any other person with regard to this report and the work referred to in this report, and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by CM3 Environmental Inc. with respect to this report and any conclusions or recommendations made in this report reflect CM3 Environmental Inc.'s judgement based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for specific application to this site and it is based, in part, upon visual observation of the site, as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site and substances addressed by the investigation may exist in areas of the site not investigated.

If site conditions or applicable standards change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by JBPA Developments Inc., copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of CM3 Environmental Inc. Nothing in this report is intended to constitute or provide a legal opinion.

9.0 REFERENCES

Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended, Ontario Ministry of Environment, 2004.

Guide for Completing Phase Two Site Assessments under Ontario Regulation 153/04, Ontario Ministry of Environment, June 2011.

Guide for Completing Phase One Site Assessments under Ontario Regulation 153/04, Ontario Ministry of Environment, June 2011.

Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, Ontario Ministry of Environment, December 1996.

Ontario Regulation 153/04 (made under the Environmental Protection Act), as amended, Ontario Ministry of Environment, 2004.

Ontario Regulation 903 (made under Ontario Water Resources Act, R.S.O. 1990, c. O.40), as amended, Ontario Ministry of Environment, 2003.

Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Ontario Ministry of Environment, April, 2011.

TABLES

Phase II Environmental Site Assessment – Revision 1

12-24 Hawthorne Avenue, Ottawa, Ontario

JBPA Developments Inc.

SDC1007

TABLE 1:
Monitoring Well Construction
Phase II ESA
12-24 Hawthorne Avenue, Ottawa
SDC1007

ID	Date Drilled	Drilling Method	TOC	Ground	Stickup	End of Hole		Well Diameter	Top of Well Screen		Bottom of Well Screen		Screen Length	Top of Sand		Well Completion
			(m arl)	(m arl)	(m)	(m bg)	(m arl)	(mm)	(m bg)	(m arl)	(m bg)	(m arl)	(m)	(m bg)	(m arl)	
MW1	15-Jul-22	SS/HSA	100.00	100.05	-0.05	4.57	95.48	32	1.52	98.53	4.57	95.48	3.05	1.22	98.83	flushmount
MW2	15-Jul-22	SS/HSA	99.85	99.94	-0.09	4.57	95.37	32	1.52	98.42	4.57	95.37	3.05	1.22	98.72	flushmount
MW3	15-Jul-22	SS/HSA	100.15	100.20	-0.05	3.35	96.85	32	1.07	99.13	3.35	96.85	2.28	0.76	99.44	flushmount

Notes:
TOC - top of well pipe casing
m - metres
mm - millimeters
m arl - metres above reference level
m bg - metres below grade
SS/HSA - split spoon and hollow stem auger

TABLE 2:
LPH and Groundwater Level Measurements
Phase II ESA
12-24 Hawthorne Avenue, Ottawa
SDC1007

Well ID	Date	TOC (marl)	Grade (marl)	Depth to		Elevation		Comments
				LPH (mbtoc)	GW (mbtoc)	LPH (marl)	GW (marl)	
MW1	29-Jul-22	100.000	100.049	--	2.116	--	97.884	
MW2	29-Jul-22	99.850	99.938	--	2.052	--	97.798	
MW3	29-Jul-22	100.150	100.201	--	2.221	--	97.929	

Notes:
TOC - top of casing
marl - metres above reference level
mbtoc - metres below top of casing
LPH - liquid phase hydrocarbons
GW - groundwater
NM - not measured
NV / -- - no value/LPH not present

TABLE 3:
Summary of Soil Analytical Results - BTEX and PHCs F1-F4
Phase II ESA
12-24 Hawthorne Avenue, Ottawa
SDC1007

Sample ID	Sample Date	Depth (m bg)	HSVL (ppm)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Xylene (Total)	PHC F1 (C6-C10)	PHC F2 (C10-C16)	PHC F3 (C16-C34)	PHC F4 (>C34)
			MDL >	0.02	0.05	0.05	0.05	0.05	0.05	7	4	8	6
			MECP Table 3 SCS >	0.21	2.3	2	NV	NV	3.1	55	98	300	2800
MW1SA3	15-Jul-22	1.52 - 2.29	25	ND (0.02)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (7)	ND (4)	ND (8)	ND (6)
MW2SA5	15-Jul-22	3.05 - 3.65	40	ND (0.02)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (7)	ND (4)	ND (8)	ND (6)
MW3SA4	15-Jul-22	1.82 - 2.44	200	ND (0.02)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (7)	ND (4)	ND (8)	ND (6)

Notes:

mg/kg - all concentrations provided in milligrams per kilogram (parts per million)
MDL - reported analytical method detection limit
HSVL - headspace vapour level (combustible vapour meter, calibrated to hexane)
m bg - metres below grade
ppm - parts per million
NV - no standard listed
"<" or "ND ( )" - less than detection limits indicated (refer to laboratory report)
"NA" or "-" - not applicable or not analysed
MECP Table 3 SCS - Ontario Ministry of Environment, Conservation and Parks (MECP) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April, 2011. Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, residential land use, coarse textured soil.
Bold / Italic - indicates concentration above applicable MECP Table 3 SCS
0.5 - MDL above applicable MECP Table 3 SCS (refer to laboratory reports)

TABLE 4:
Summary of Groundwater Analytical Results - BTEX and PHCs F1-F4
Phase II ESA
12-24 Hawthorne Avenue, Ottawa
SDC1007

Sample ID	Sample Date	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Xylene (Total)	PHC F1 (C6-C10)	PHC F2 (C10-C16)	PHC F3 (C16-C34)	PHC F4 (>C34)
	MDL >	0.5	0.5	0.5	0.5	0.5	0.5	25	100	100	100
	MECP Table 3 SCS >	44	18000	2300	NV	NV	4200	750	150	500	500
MW1	29-Jul-22	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (25)	ND (100)	ND (100)	ND (100)
MW2	29-Jul-22	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (25)	ND (100)	ND (100)	ND (100)
MW3	29-Jul-22	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (25)	ND (100)	ND (100)	ND (100)

Notes:

µg/L - all concentrations provided in micrograms per litre (parts per billion)
MDL - reported analytical method detection limit
ppm - parts per million
NV - no standard listed
"<" or "ND ( )" - less than detection limits indicated (refer to laboratory report)
NA - not applicable
MECP Table 3 SCS - Ontario Ministry of Environment, Conservation and Parks (MECP) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April, 2011. Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, residential land use, coarse textured soil.
Bold / Italic - indicates concentration above applicable MECP Table 3 SCS
0.5 - MDL above applicable MECP Table 3 SCS (refer to laboratory reports)

TABLE 5:
Soil and Groundwater Maximum Concentrations
Phase II ESA
12-24 Hawthorne Avenue, Ottawa
SDC1007

Parameter	SOIL					GROUNDWATER				
	MDL	MECP Table 8 SCS	Maximum Concentration mg/kg	Location Sample ID	Depth Sample Interval m bg	MDL	MECP Table 8 SCS	Maximum Concentration µg/L	Location/ Sample ID	Depth Screen Interval m bg
BTEX										
Benzene	0.02	**0.17**	ND (0.02)	-	-	0.5	**430**	ND (0.5)	-	-
Toluene	0.05	**6**	ND (0.05)	-	-	0.5	**18000**	ND (0.5)	-	-
Ethylbenzene	0.05	**15**	ND (0.05)	-	-	0.5	**2300**	ND (0.5)	-	-
m,p-Xylene	0.05	**NV**	ND (0.05)	-	-	0.5	**NV**	ND (0.5)	-	-
o-Xylene	0.05	**NV**	ND (0.05)	-	-	0.5	**NV**	ND (0.5)	-	-
Xylene (Total)	0.05	**25**	ND (0.05)	-	-	0.5	**4200**	ND (0.5)	-	-
Hydrocarbons (PHCs F1-F4)										
PHC F1(C6-C10)	7	**65**	ND (7)	-	-	25	**750**	ND (25)	-	-
PHC F2(C10-C16)	4	**150**	ND (4)	-	-	100	**150**	ND (100)	-	-
PHC F3(C16-C34)	8	**1300**	ND (8)	-	-	100	**500**	ND (100)	-	-
PHC F4(>C34)	6	**5600**	ND (6)	-	-	100	**500**	ND (100)	-	-

Notes:

mg/kg - milligrams per kilogram (parts per million)
µg/L - micrograms per litre
MDL - reported analytical method detection limit
m bg - metres below grade
NV - no standard listed
"<" or "ND ( )" - less than detection limits indicated (refer to laboratory report)
"NA" or "-" - not analysed
MECP Table 3 SCS - Ontario Ministry of Environment, Conservation and Parks (MECP) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April, 2011.
Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, residential land use, fine textured soil.
Bold / Italic - indicates concentration above applicable

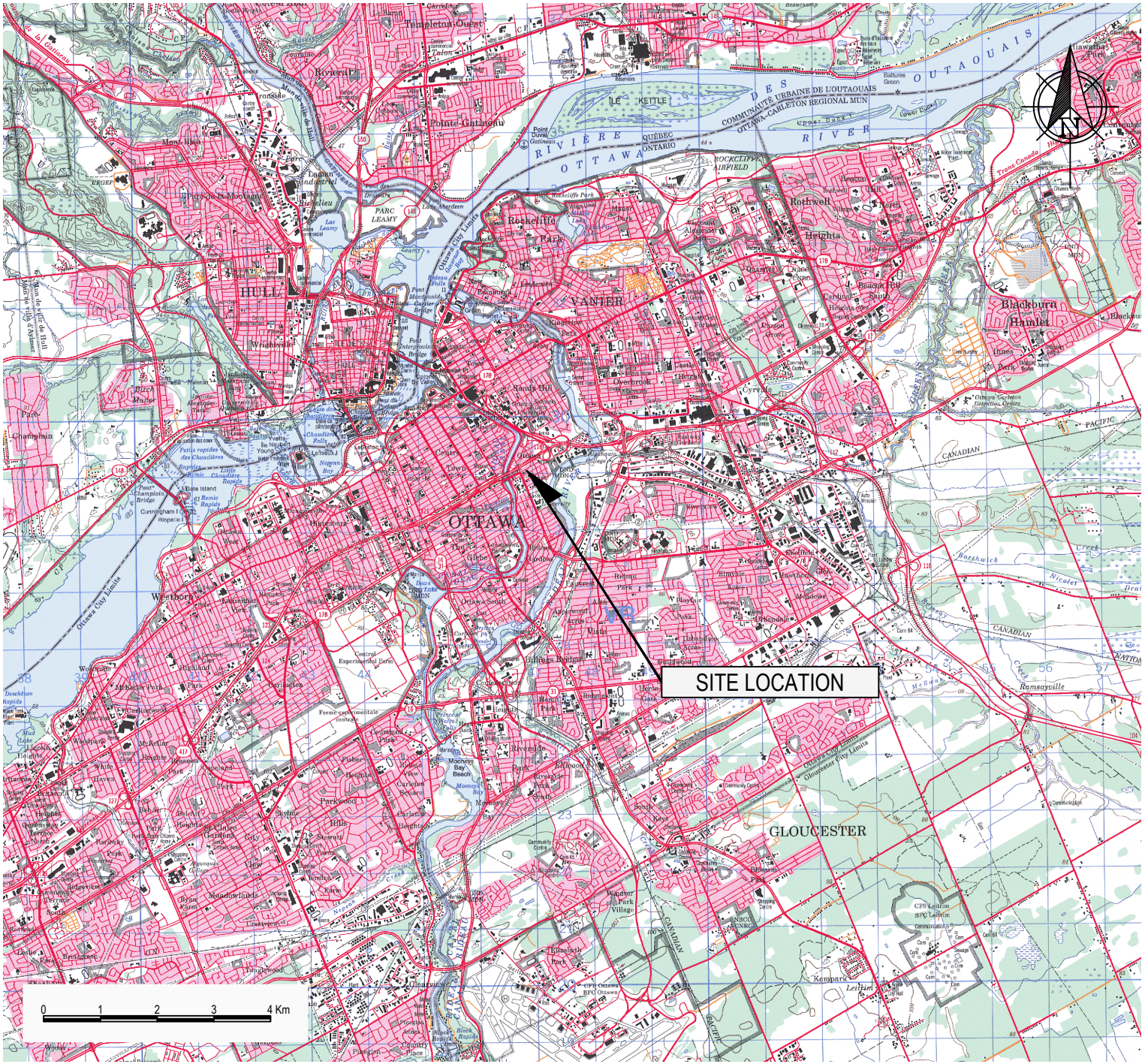
FIGURES

Phase II Environmental Site Assessment – Revision 1

12-24 Hawthorne Avenue, Ottawa, Ontario

JBPA Developments Inc.

SDC1007



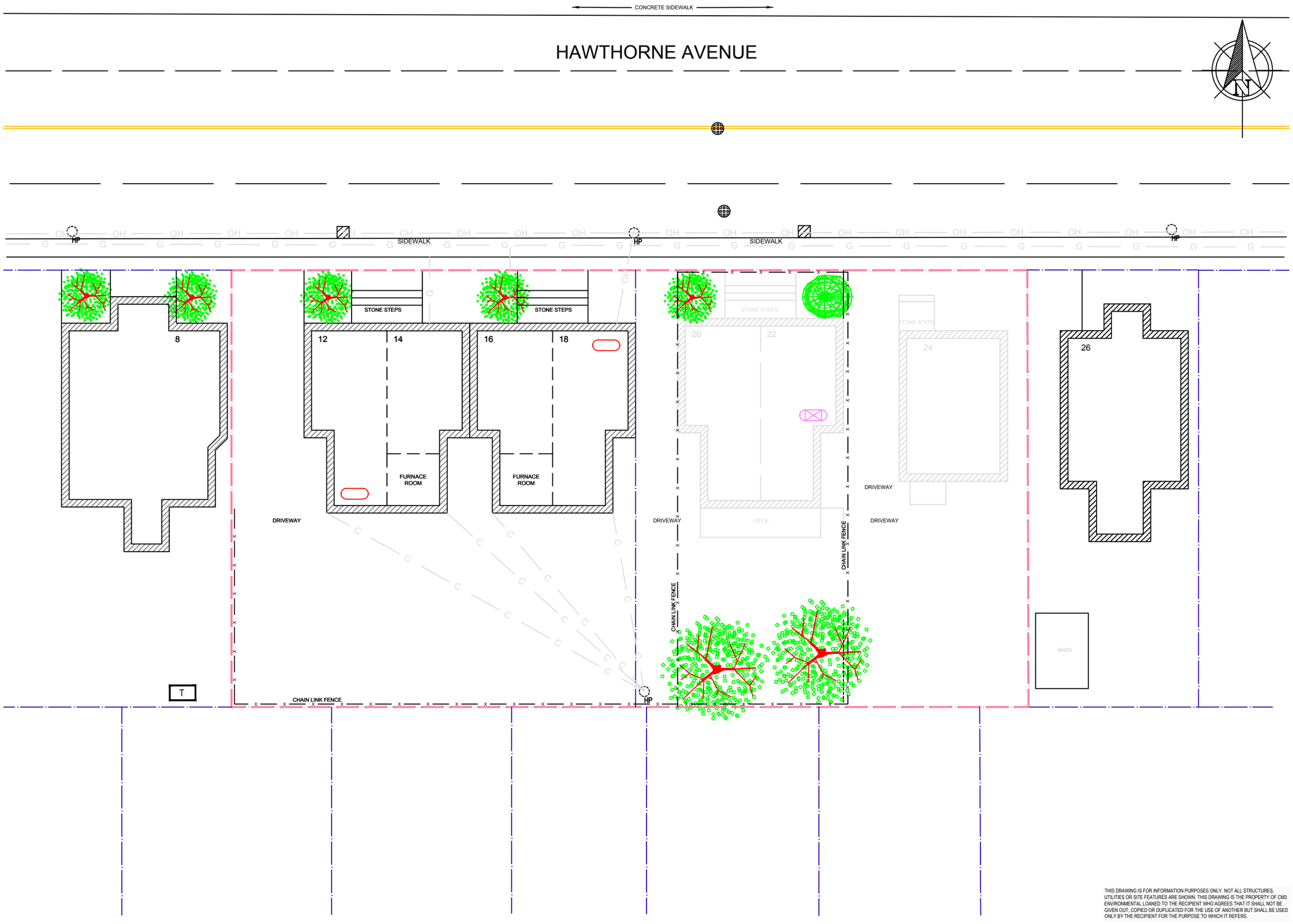
5710 AKINS ROAD, OTTAWA, ON
K2S 1B8

JBPA DEVELOPMENTS INC.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

SITE LOCATION

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
AS SHOWN	1	1



LEGEND

- PROPERTY BOUNDARY
- SUBJECT PROPERTY
- RESIDENCE/BUILDINGS
- FORMER RESIDENCE/BUILDINGS
- EXISTING FENCES
- AST
- FORMER AST

UTILITIES/SERVICES

- GAS
- OVERHEAD HYDRO
- OVERHEAD COMMUNICATIONS
- HYDRO POLE
- TRANSFORMER
- CATCH BASIN
- MANHOLE (STORM)

Scale 1:250

0 2 4 6 8 m

(Approx. When plotted 11x17)

cm3 environmental

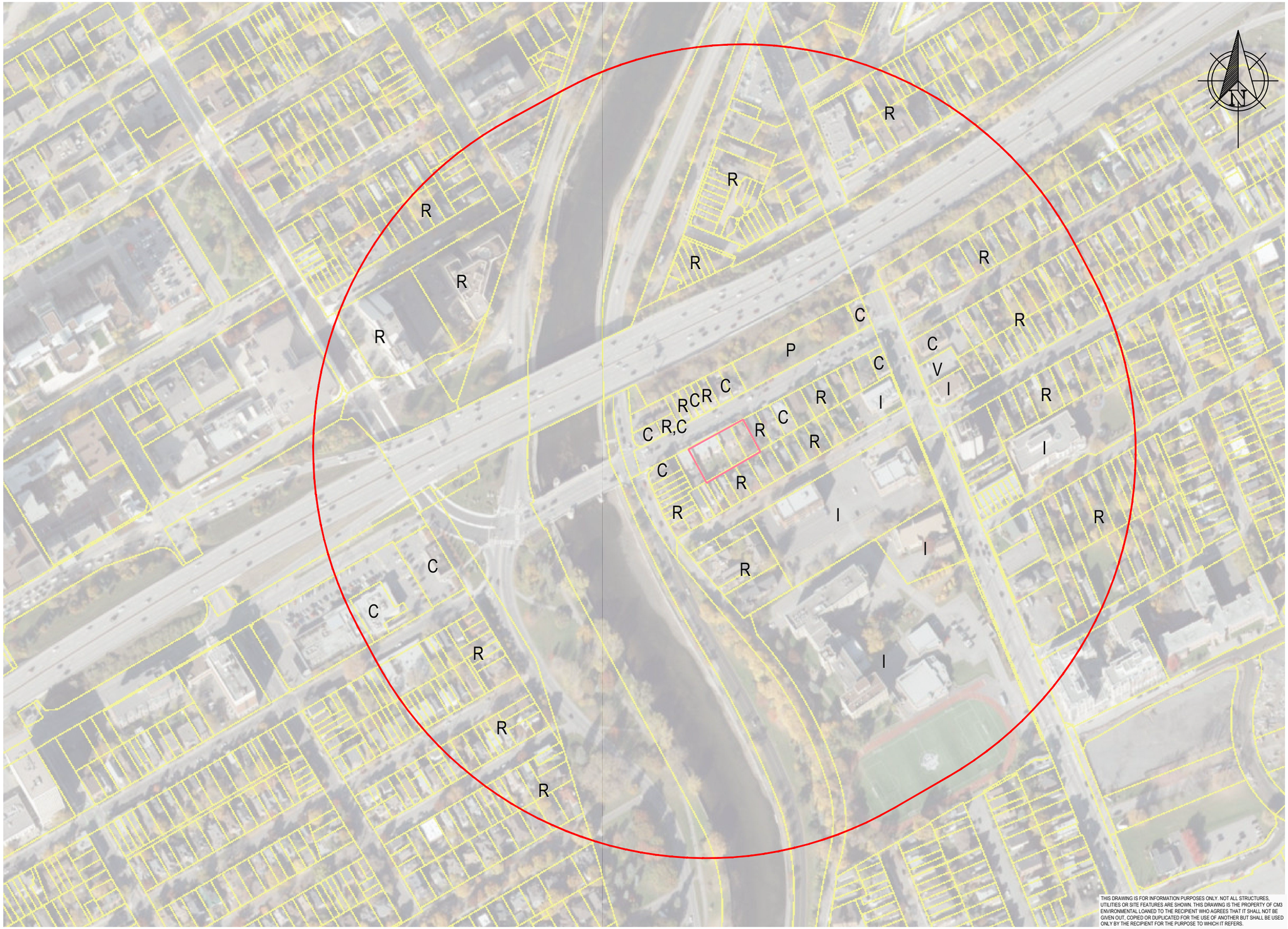
5710 AKINS ROAD, OTTAWA, ON
K2S 1B8

JBPA DEVELOPMENTS INC.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

SITE PLAN

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:250	2	1



LEGEND

- PROPERTY BOUNDARY
- SUBJECT PROPERTY
- SUBJECT PROPERTY

LAND USE

- R RESIDENTIAL
- C COMMERCIAL
- I INSTITUTIONAL
- P PARK
- V VACANT

cm3 environmental
5710 AKINS ROAD, OTTAWA, ON
K2S 1B8

JBPA DEVELOPMENTS INC.

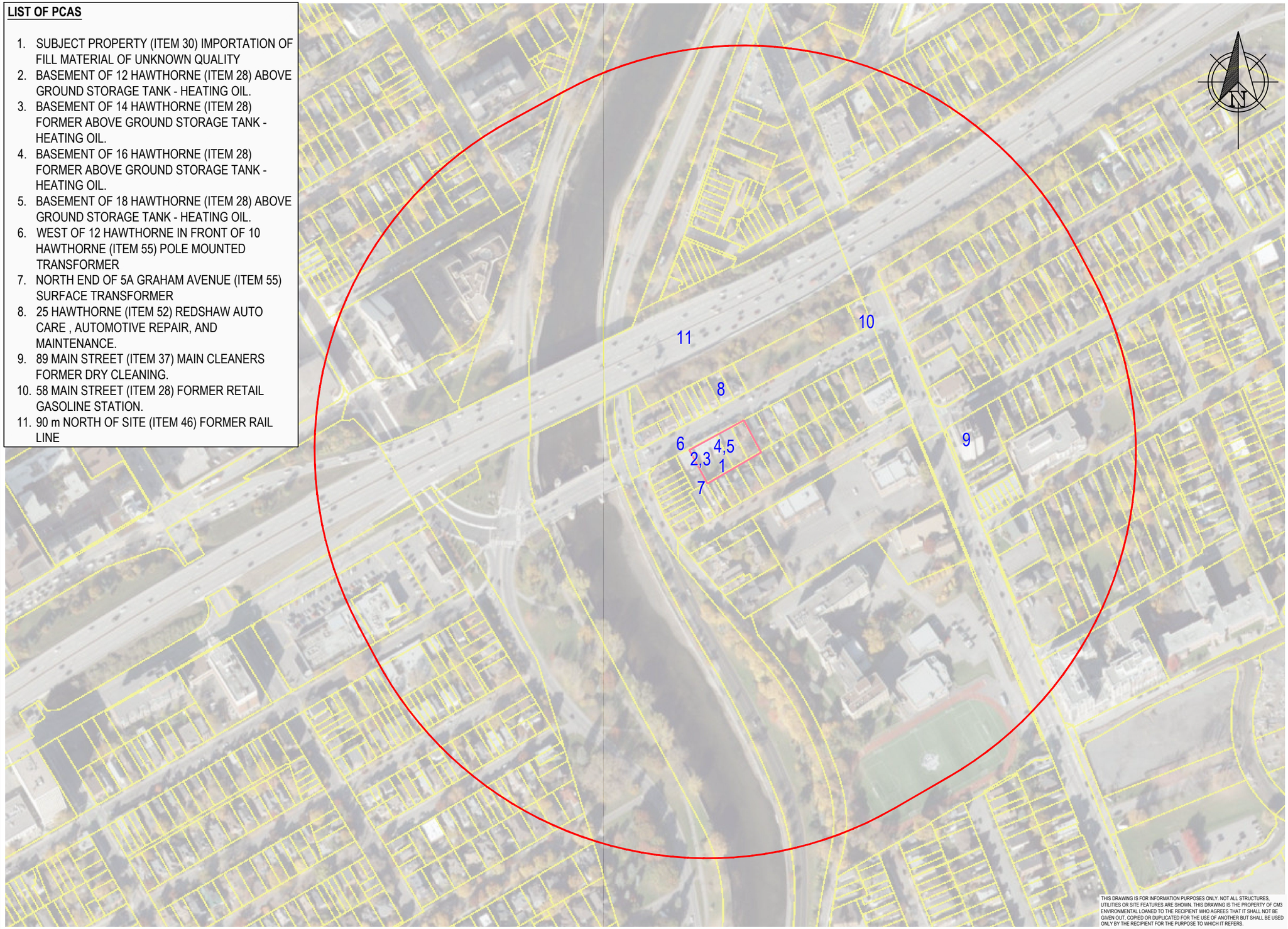
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

PHASE I STUDY AREA

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:3000	3	1

LIST OF PCAS

1. SUBJECT PROPERTY (ITEM 30) IMPORTATION OF FILL MATERIAL OF UNKNOWN QUALITY
2. BASEMENT OF 12 HAWTHORNE (ITEM 28) ABOVE GROUND STORAGE TANK - HEATING OIL.
3. BASEMENT OF 14 HAWTHORNE (ITEM 28) FORMER ABOVE GROUND STORAGE TANK - HEATING OIL.
4. BASEMENT OF 16 HAWTHORNE (ITEM 28) FORMER ABOVE GROUND STORAGE TANK - HEATING OIL.
5. BASEMENT OF 18 HAWTHORNE (ITEM 28) ABOVE GROUND STORAGE TANK - HEATING OIL.
6. WEST OF 12 HAWTHORNE IN FRONT OF 10 HAWTHORNE (ITEM 55) POLE MOUNTED TRANSFORMER
7. NORTH END OF 5A GRAHAM AVENUE (ITEM 55) SURFACE TRANSFORMER
8. 25 HAWTHORNE (ITEM 52) REDSHAW AUTO CARE , AUTOMOTIVE REPAIR, AND MAINTENANCE.
9. 89 MAIN STREET (ITEM 37) MAIN CLEANERS FORMER DRY CLEANING.
10. 58 MAIN STREET (ITEM 28) FORMER RETAIL GASOLINE STATION.
11. 90 m NORTH OF SITE (ITEM 46) FORMER RAIL LINE



LEGEND

PROPERTY BOUNDARY
SUBJECT PROPERTY

Scale 1:3000

0 30 60 90 120 m

(Approx. When plotted 11x17)

cm3 environmental
5710 AKINS ROAD, OTTAWA, ON
K2S 1B8

JBPA DEVELOPMENTS INC.

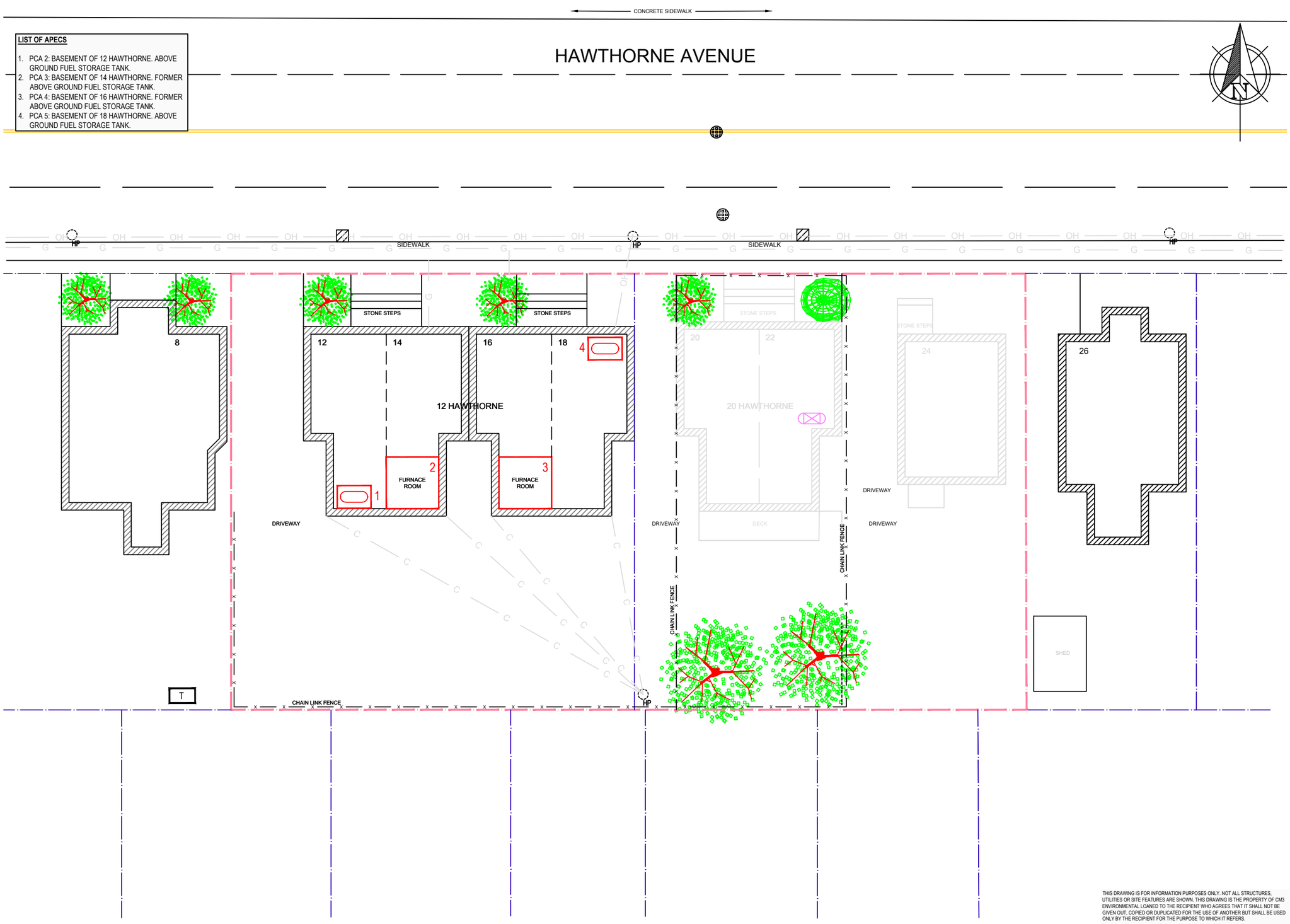
PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

POTENTIALLY
CONTAMINATING ACTIVITIES

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:3000	4	1

LIST OF APECS

1. PCA 2: BASEMENT OF 12 HAWTHORNE. ABOVE GROUND FUEL STORAGE TANK.
2. PCA 3: BASEMENT OF 14 HAWTHORNE. FORMER ABOVE GROUND FUEL STORAGE TANK.
3. PCA 4: BASEMENT OF 16 HAWTHORNE. FORMER ABOVE GROUND FUEL STORAGE TANK.
4. PCA 5: BASEMENT OF 18 HAWTHORNE. ABOVE GROUND FUEL STORAGE TANK.



LEGEND

- PROPERTY BOUNDARY
- SUBJECT PROPERTY
- RESIDENCE/BUILDINGS
- FORMER RESIDENCE/BUILDINGS
- EXISTING FENCES
- AST
- FORMER AST

UTILITIES/SERVICES

- GAS
- OVERHEAD HYDRO
- OVERHEAD COMMUNICATIONS
- HYDRO POLE
- TRANSFORMER
- CATCH BASIN
- MANHOLE (STORM)

- APEC

Scale 1:250

0 2 4 6 8 m

(Approx. When plotted 11x17)

cm3 environmental

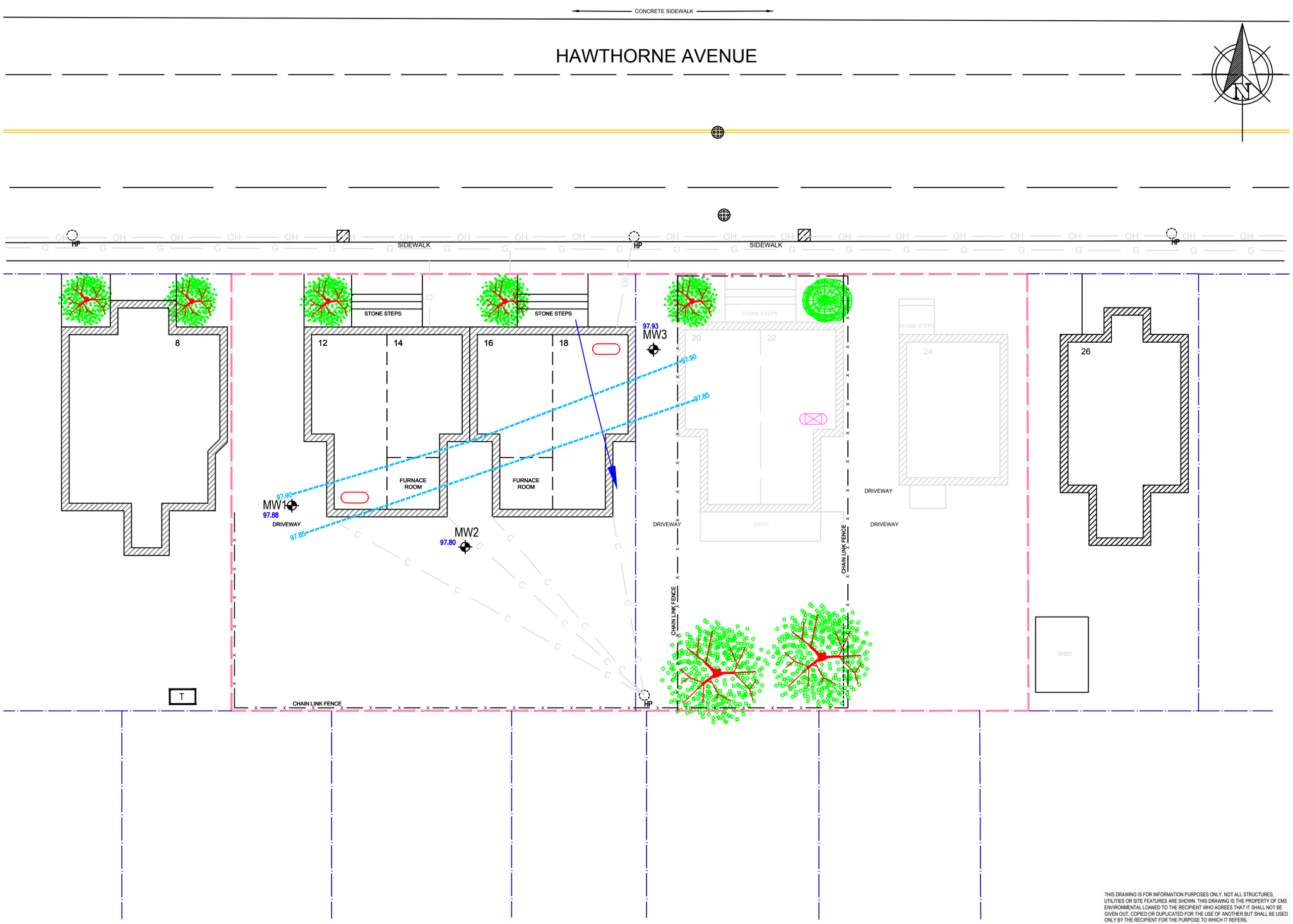
5710 AKINS ROAD, OTTAWA, ON K2S 1B8

JBPA DEVELOPMENTS INC.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:250	5	1



LEGEND

- PROPERTY BOUNDARY
- SUBJECT PROPERTY
- RESIDENCE/BUILDINGS
- FORMER RESIDENCE/BUILDINGS
- EXISTING FENCES
- AST
- FORMER AST

UTILITIES/SERVICES

- GAS
- OVERHEAD HYDRO
- OVERHEAD COMMUNICATIONS
- HYDRO POLE
- TRANSFORMER
- CATCH BASIN
- MANHOLE (STORM)

- MONITORING WELL
- 94.66 GROUNDWATER ELEVATION (m.a.r.l)
- INFERRED GROUNDWATER ELEVATION CONTOUR
- INFERRED GROUNDWATER FLOW DIRECTION

Scale 1:250

0 2 4 6 8 m

(Approx. When plotted 11x17)

cm3 environmental

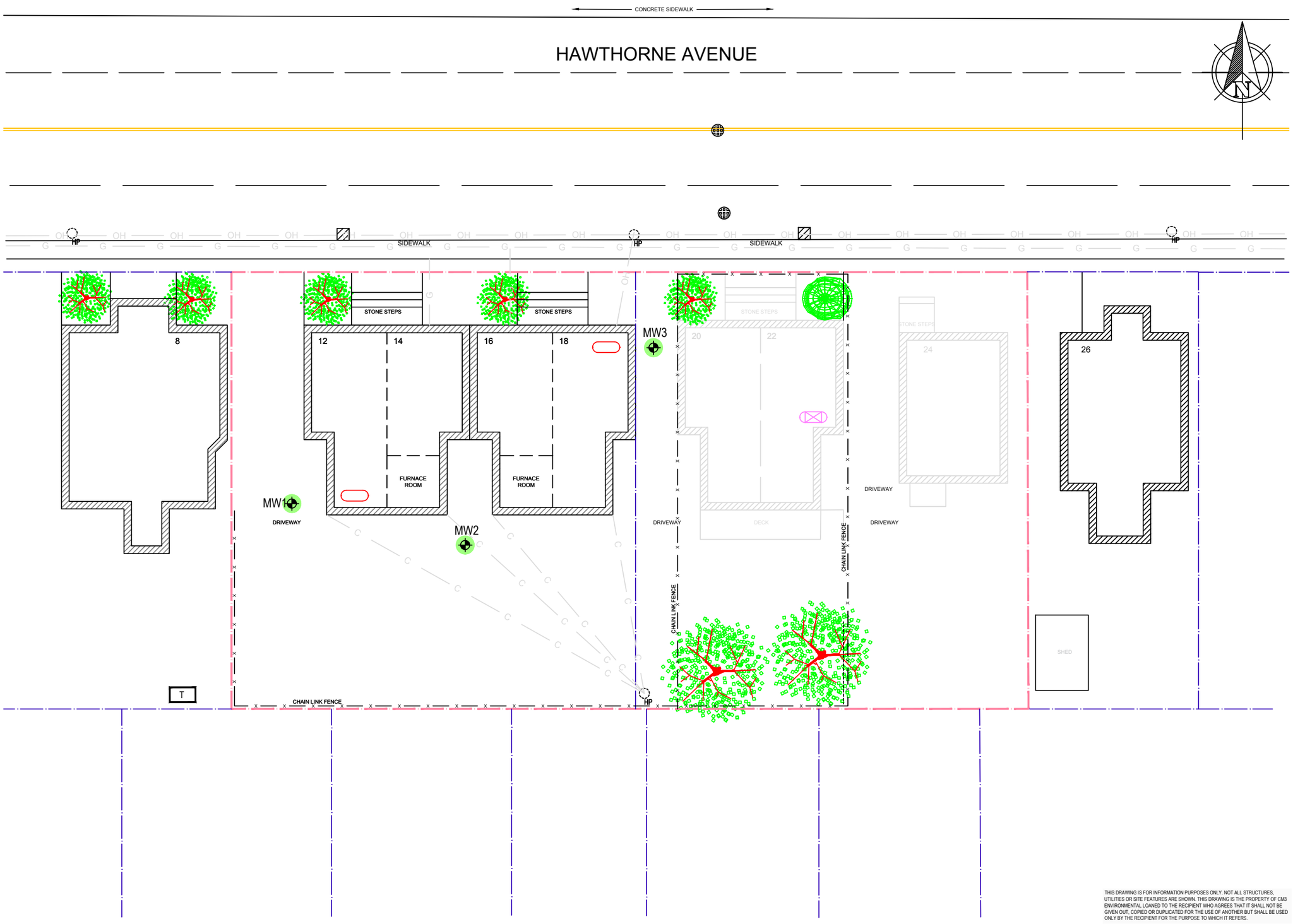
5710 AKINS ROAD, OTTAWA, ON
K2S 1B8

JBPA DEVELOPMENTS INC.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

MONITORING WELL
GROUNDWATER FLOW
JULY 29 2022

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:250	6	1



LEGEND

- PROPERTY BOUNDARY
- SUBJECT PROPERTY
- RESIDENCE/BUILDINGS
- FORMER RESIDENCE/BUILDINGS
- EXISTING FENCES
- AST
- FORMER AST

UTILITIES/SERVICES

- GAS
- OVERHEAD HYDRO
- OVERHEAD COMMUNICATIONS
- HYDRO POLE
- TRANSFORMER
- CATCH BASIN
- MANHOLE (STORM)
- MONITORING WELL

SOIL SAMPLES ANALYSED*:

- BTEX AND PHCs NOT DETECTED
- BTEX AND/OR PHCs < MECP TABLE 3 SCS
- BTEX AND/OR PHCs > MECP TABLE 3 SCS

Scale 1:250

0 2 4 6 8 m

(Approx. When plotted 11x17)

cm3 environmental

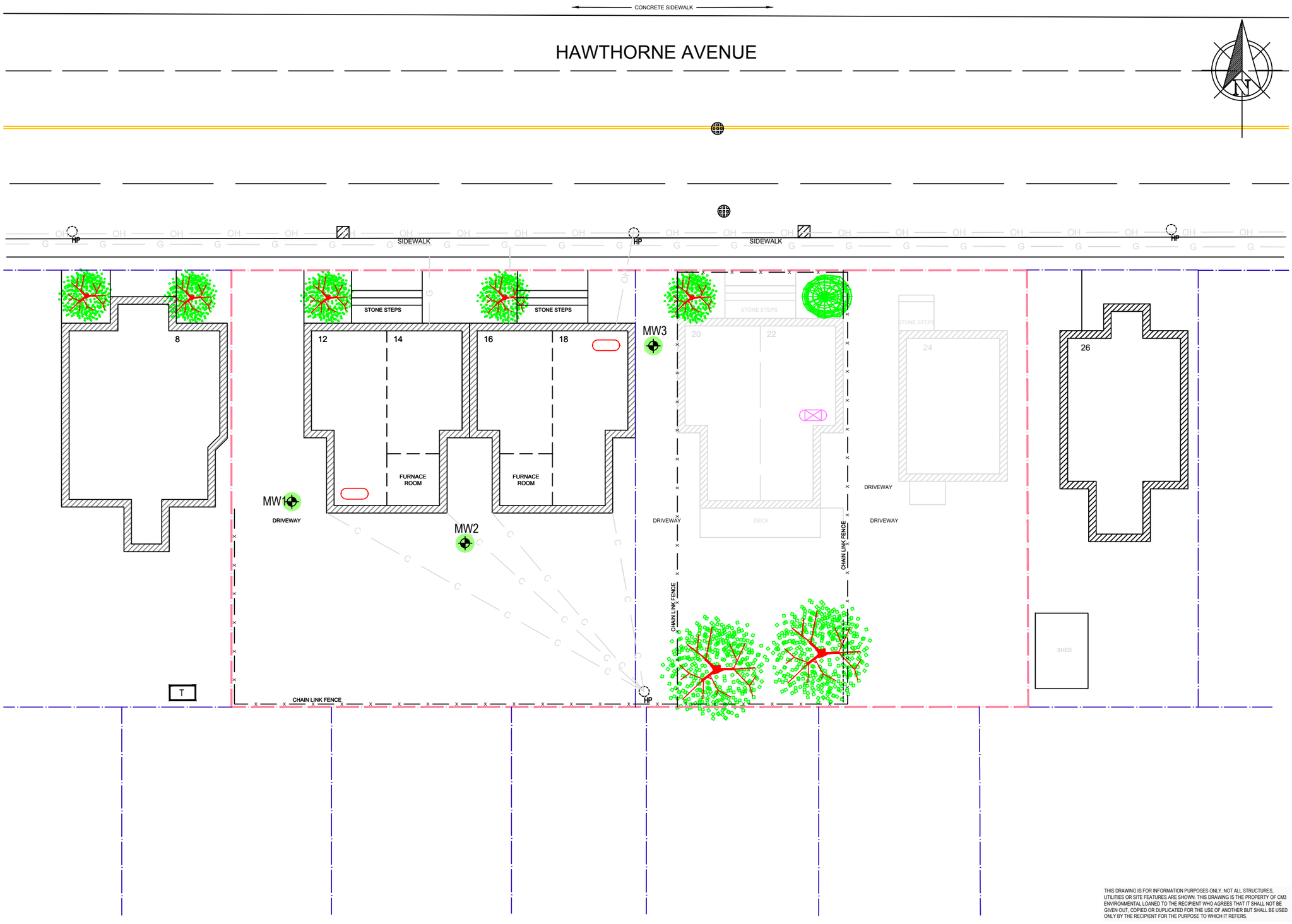
5710 AKINS ROAD, OTTAWA, ON
K2S 1B8

JBPA DEVELOPMENTS INC.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

SOIL QUALITY

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:250	7	1



LEGEND

- PROPERTY BOUNDARY
- SUBJECT PROPERTY
- RESIDENCE/BUILDINGS
- FORMER RESIDENCE/BUILDINGS
- EXISTING FENCES
- AST
- FORMER AST

UTILITIES/SERVICES

- GAS
- OVERHEAD HYDRO
- OVERHEAD COMMUNICATIONS
- HYDRO POLE
- TRANSFORMER
- CATCH BASIN
- MANHOLE (STORM)
- MONITORING WELL

GROUNDWATER SAMPLES ANALYSED*:

- BTEX AND PHCs NOT DETECTED
- BTEX AND/OR PHCs < MECP TABLE 3 SCS
- BTEX AND/OR PHCs > MECP TABLE 3 SCS

Scale 1:250

0 2 4 6 8 m

(Approx. When plotted 11x17)

cm3 environmental

5710 AKINS ROAD, OTTAWA, ON K2S 1B8

JBPA DEVELOPMENTS INC.

PHASE II
ENVIRONMENTAL SITE ASSESSMENT
12-24 HAWTHORNE AVENUE,
OTTAWA, ONTARIO

GROUNDWATER QUALITY

Project:	Drawn By:	
SDC1007	SDC	
Date:	Reviewed By:	
APRIL 2023	BDC	
Scale:	Figure:	Revision:
1:250	8	1

APPENDIX A

BOREHOLE LOGS

Phase II Environmental Site Assessment – Revision 1

12-24 Hawthorne Avenue, Ottawa, Ontario

JBPA Developments Inc.

SDC1007

BOREHOLE LOG

CM³ JOB NO: SDC1007

CLIENT: **JBPA DEVELOPMENTS INC.**

PROJECT: **12-18 Hawthorne Avenue, Ottawa Ontario**

BOREHOLE NO: MW1

SURFACE ELEVATION: 100.05 m

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 – 10 – 100	WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
-1										101
0					Ground Surface				flushmount in concrete j-plug	100
		SA1			**Gravel** gravel, some sand (fill), grey and brown, dry **Sand** fine to medium sand, some silt, compact, laminated, brown, moist	20			bentonite seal	
1		SA2			**Clay** clay, some silt, firm, low to medium plasticity, grey, moist	25			32 mm solid PVC pipe	99
		SA3				30				
2								▽	GW = 97.93 m (7/22/2029)	98
		SA4				20				
3					wet at 3m soft, high plasticity				32 mm 010 slot PVC pipe	97
		SA5				30			silica sand	
4										96
		SA6				30			bottom cap	
					End of borehole at 4.57 m					

DRILLING METHOD: Hollow Stem Auger and Split Spoon

BOREHOLE DIAMETER: 0.03 m (OD)

DRILL DATE: July 15, 2022 LOGGED BY: SDC

Notes: SPLIT SPOON

BOREHOLE LOG

CM³ JOB NO: SDC1007

CLIENT: **JBPA DEVELOPMENTS INC.**

PROJECT: **12-18 Hawthorne Avenue, Ottawa Ontario**

BOREHOLE NO: MW2

SURFACE ELEVATION: 99.94 m

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv)	WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
-1										101
0					Ground Surface				flushmount in concrete j-plug	100
		SA1			**Topsoil** black, dry **Sand** fine to medium sand, some silt, compact, laminated, brown, moist	0			bentonite seal	
1		SA2				15			32 mm solid PVC pipe	99
		SA3			**Clay** firm, low to medium plasticity, grey, moist	25		▽	GW = 97.89 m (7/22/2029)	98
		SA4				35				
3		SA5			wet at 3m	40			32 mm 010 slot PVC pipe silica sand	97
4										96
					End of borehole at 4.57 m				bottom cap	

DRILLING METHOD: Hollow Stem Auger and Split Spoon

BOREHOLE DIAMETER: 0.03 m (OD)

DRILL DATE: July 15, 2022 LOGGED BY: SDC

Notes: SPLIT SPOON

CM³ JOB NO: SDC1007

CLIENT: **JBPA DEVELOPMENTS INC.**

PROJECT: **12-18 Hawthorne Avenue**
Ottawa Ontario

BOREHOLE LOG

BOREHOLE NO: MW3

SURFACE ELEVATION: 100.20 m

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv)	WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
					Ground Surface	1 10 100 1000				
0					**Asphalt**				flushmount in concrete j-plug	100
		SA1			**Gravel** gravel, some sand (fill), grey and brown, dry	150				
					Sand fine to medium sand, some silt, compact, laminated, brown, moist				bentonite seal	
		SA2				130			32 mm solid PVC pipe	
1					**Clay** clay, some silt, firm, low to medium plasticity, grey, moist					99
		SA3				150			32 mm 010 slot PVC pipe	
2										
		SA4				200		▽	GW = 97.98 m (7/22/2029)	98
		SA5				140				
3										
		SA6				120			bottom cap	97
					End of borehole at 3.35 m					

DRILLING METHOD: Hollow Stem Auger and Split Spoon
BOREHOLE DIAMETER: 0.03 m (OD)

DRILL DATE: July 15, 2022 LOGGED BY: SDC

Notes: AUGER SAMPLE
SPLIT SPOON

APPENDIX B

LABORATORY REPORTS

Phase II Environmental Site Assessment – Revision 1

12-24 Hawthorne Avenue, Ottawa, Ontario

JBPA Developments Inc.

SDC1007

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

CM3 Environmental Inc.

5710 Akins Road
Ottawa, ON K2S 1B8
Attn: Spencer Cochrane

Client PO: Hawthorne
Project: SDC1007
Custody: 137658

Report Date: 22-Jul-2022
Order Date: 15-Jul-2022

Order #: 2230017

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

Paracel ID	Client ID
2230017-01	MW1 SA3
2230017-02	MW2 SA5
2230017-03	MW3 SA4

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Client: CM3 Environmental Inc.

Client PO: Hawthorne

Report Date: 22-Jul-2022

Order Date: 15-Jul-2022

Project Description: SDC1007

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	19-Jul-22	20-Jul-22
PHC F1	CWS Tier 1 - P&T GC-FID	19-Jul-22	20-Jul-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	18-Jul-22	22-Jul-22
Solids, %	Gravimetric, calculation	19-Jul-22	19-Jul-22

Certificate of Analysis

Report Date: 22-Jul-2022

Client: CM3 Environmental Inc.

Order Date: 15-Jul-2022

Client PO: Hawthorne

Project Description: SDC1007

	Client ID:	MW1 SA3	MW2 SA5	MW3 SA4	-
	Sample Date:	15-Jul-22 09:00	15-Jul-22 09:00	15-Jul-22 09:00	-
	Sample ID:	2230017-01	2230017-02	2230017-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	83.9	67.5	73.1	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Toluene-d8	Surrogate	128%	135%	127%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	-

Certificate of Analysis

Report Date: 22-Jul-2022

Client: CM3 Environmental Inc.

Order Date: 15-Jul-2022

Client PO: Hawthorne

Project Description: SDC1007

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*9.17*		*ug/g*		*115*	*50-140*			

Certificate of Analysis

Client: CM3 Environmental Inc.

Client PO: Hawthorne

Report Date: 22-Jul-2022

Order Date: 15-Jul-2022

Project Description: SDC1007

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g	ND			NC	40	
F2 PHCs (C10-C16)	ND	4	ug/g	ND			NC	30	
F3 PHCs (C16-C34)	150	8	ug/g	119			22.6	30	
F4 PHCs (C34-C50)	360	6	ug/g	392			8.4	30	
Physical Characteristics									
% Solids	77.3	0.1	% by Wt.	77.2			0.0	25	
Volatiles									
Benzene	ND	0.02	ug/g	ND			NC	50	
Ethylbenzene	ND	0.05	ug/g	ND			NC	50	
Toluene	ND	0.05	ug/g	ND			NC	50	
m,p-Xylenes	ND	0.05	ug/g	ND			NC	50	
o-Xylene	ND	0.05	ug/g	ND			NC	50	
Surrogate: Toluene-d8	*12.6*		*ug/g*		*125*	*50-140*			

Certificate of Analysis

Report Date: 22-Jul-2022

Client: CM3 Environmental Inc.

Order Date: 15-Jul-2022

Client PO: Hawthorne

Project Description: SDC1007

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	194	7	ug/g	ND	97.1	80-120			
F2 PHCs (C10-C16)	107	4	ug/g	ND	126	60-140			
F3 PHCs (C16-C34)	234	8	ug/g	ND	119	80-120			
F4 PHCs (C34-C50)	148	6	ug/g	ND	119	80-120			
Volatiles									
Benzene	4.54	0.02	ug/g	ND	114	60-130			
Ethylbenzene	4.72	0.05	ug/g	ND	118	60-130			
Toluene	4.67	0.05	ug/g	ND	117	60-130			
m,p-Xylenes	7.97	0.05	ug/g	ND	99.6	60-130			
o-Xylene	4.54	0.05	ug/g	ND	113	60-130			
Surrogate: Toluene-d8	*7.26*		*ug/g*		*90.7*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

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

PARACEL LABORATORIES LTD.

TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

CM3 Environmental Inc.

5710 Akins Road
Ottawa, ON K2S 1B8
Attn: Spencer Cochrane

Client PO: Hawthorne
Project: SDC1007
Custody: 133301

Report Date: 3-Aug-2022
Order Date: 29-Jul-2022

Order #: 2231544

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

Paracel ID	Client ID
2231544-01	MW1
2231544-02	MW2
2231544-03	MW3

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis

Client: CM3 Environmental Inc.

Client PO: Hawthorne

Report Date: 03-Aug-2022

Order Date: 29-Jul-2022

Project Description: SDC1007

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	2-Aug-22	2-Aug-22
PHC F1	CWS Tier 1 - P&T GC-FID	2-Aug-22	2-Aug-22
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	2-Aug-22	3-Aug-22

Certificate of Analysis

Client: CM3 Environmental Inc.

Client PO: Hawthorne

Report Date: 03-Aug-2022

Order Date: 29-Jul-2022

Project Description: SDC1007

	Client ID:	MW1	MW2	MW3	-
	Sample Date:	29-Jul-22 09:00	29-Jul-22 09:00	29-Jul-22 09:00	-
	Sample ID:	2231544-01	2231544-02	2231544-03	-
	MDL/Units	Water	Water	Water	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	-
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	-
Toluene-d8	Surrogate	101%	102%	101%	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*82.0*		*ug/L*		*102*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND			NC	30	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*80.9*		*ug/L*		*101*	*50-140*			

Certificate of Analysis

Client: CM3 Environmental Inc.

Client PO: Hawthorne

Report Date: 03-Aug-2022

Order Date: 29-Jul-2022

Project Description: SDC1007

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	2050	25	ug/L	ND	102	68-117			
F2 PHCs (C10-C16)	2000	100	ug/L	ND	125	60-140			
F3 PHCs (C16-C34)	4130	100	ug/L	ND	105	60-140			
F4 PHCs (C34-C50)	2750	100	ug/L	ND	111	60-140			
Volatiles									
Benzene	38.9	0.5	ug/L	ND	97.2	60-130			
Ethylbenzene	38.3	0.5	ug/L	ND	95.8	60-130			
Toluene	37.7	0.5	ug/L	ND	94.4	60-130			
m,p-Xylenes	74.1	0.5	ug/L	ND	92.6	60-130			
o-Xylene	37.9	0.5	ug/L	ND	94.7	60-130			
Surrogate: Toluene-d8	*79.0*		*ug/L*		*98.8*	*50-140*			

Qualifier Notes:

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

CCME PHC additional information:

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