

March 2, 2020

Mattamy Development Corporation c/o Shad & Associates Inc. 83 Citation Drive, Unit 9 Vaughan, Ontario

Attention: Dr. Houshang Shad, PhD, P.Eng

Re: Update Phase One Environmental Site Assessment

Parts of Lot 21 and 22, Concession 5, Pickering, Ontario

Pinchin File: 213894

Pinchin Ltd. (Pinchin) is pleased to provide the findings of our Update Phase One Environmental Site Assessment (ESA) to Shad and Associates on behalf of Mattamy Development Corporation (Client) for the property located at Parts of Lot 21 and 22, Concession 5 (Phase One Property or Site).

E-mail: houshang@shadinc.ca

1.0 BACKGROUND

This Update Phase One Environmental Site Assessment (ESA) has been prepared by Pinchin Ltd. (Pinchin) for Mattamy Development Corporation (Client) as an update to a Phase One ESA dated January 12, 2018 completed for the property located at Parts of Lot 21 and 22, Concession 5 in Pickering, Ontario. The Site location is shown on Figure 1, and the Phase One Property and Phase One Study Area are shown on Figure 2 (all figures are provided in Appendix I).

Pinchin previously prepared the following reports for Client:

- "Phase One Environmental Site Assessment, Parts of Lot 21 and 22, Concession 5,
 Pickering, Ontario" and dated January 12, 2018 (2018 Pinchin Phase One ESA Report);
 and
- "Phase Two Environmental Site Assessment, Parts of Lot 21 and 22, Concession 5, Pickering, Ontario" and dated September 5, 2018 (2018 Pinchin Phase Two ESA Report).

At the time of the above-noted assessments, the Phase One Property consisted of undeveloped agricultural land.

Based on information obtained during the 2018 Pinchin Phase One ESA, one area of potential environmental concern (APEC) with one corresponding potential contaminant of concern (PCOC) was identified that could potentially affect the environmental condition of the subsurface media on, in or under

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the Phase One Property. The PCOC associated with the identified APEC was based on a review of the contaminating source areas and hazardous substances associated with the related activities.

The PCOC was APEC-specific and was determined based on several sources of information, including but not limited to: Pinchin's experience with environmental contamination and hazardous substances; common industry practices for analysis of such contaminants and point sources; literature reviews of PCOCs and associated hazardous substances; and evaluations of contaminant mobility and susceptibility for migration in the subsurface.

The following table presents the identified APEC and associated PCOC:

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On- Site or Off- Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Historical and Current Agricultural Operations)	Entirety of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large- Scale Applications	On-Site	OC Pesticides	Soil

Notes:

OC - organochlorine

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On- Site or Off- Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Historical and Current Agricultural Operations)	Entirety of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large- Scale Applications	On-Site	OC Pesticides	Soil

Notes:

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The Potentially Contaminating Activity (PCA) in the above-noted table is discussed in further detail in the 2018 Pinchin Phase One ESA Report. Based on the findings of this report in 2018, Pinchin recommended completing a Phase Two ESA at the Phase One Property.

The 2018 Pinchin Phase One ESA Report was completed for Client in order to support the filing of a Record of Site Condition (RSC) at the Site in accordance with in accordance with Part VII and Schedule D of the Province of Ontario's *Environmental Protection Act R.S.O. 1990, c. E.19* and *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, and last amended by Ontario Regulation 312/17 on July 28, 2017 (O. Reg. 153/04). The filing of an RSC with the Ontario Ministry of the Environment, Conservation and Parks (MECP) is required for the intended future residential development of the Phase One Property. Given that the Phase One Property is to be redeveloped from agricultural to residential land, there is no requirement that an RSC be filed per Section 168.3.1 of the Province of Ontario's *Environmental Protection Act.* However, Pinchin notes that the RSC is required to satisfy the City of Pickering's requirements for property redevelopment and that the Site is not intended to be redeveloped to a more sensitive land use.

The purposes of this Update Phase One ESA were to:

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Parts of Lot 21 and 22, Concession 5, Pickering, Ontario

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Assess whether any new APECs or PCAs exist at the Phase One Property or Phase One Study

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- Provide a revised table and figures summarizing PCAs identified in the Phase One Study Area;
 and
- Provide a revised Phase One Conceptual Site Model (Phase One CSM) following further consideration of potential exposure pathways and ecological receptors.

The Update Phase One ESA constitute the Phase One ESA reporting requirements necessary to support the filing of an RSC for the Site in accordance with O. Reg. 153/04. An update must be prepared if a Phase One ESA report is more than 18 months old prior to filing an RSC.

The APEC listed in the table above was considered to be the basis of the Phase Two ESA activities.

2.0 SCOPE OF WORK

Area:

The scope of work for this Update Phase One ESA was consistent with O. Reg. 153/04 in support of filing an RSC and was comprised of a Site reconnaissance. The Site reconnaissance comprised of a visual assessment of the Phase One Property and the surrounding properties within the Phase One Study Area (from publicly-accessible areas) including any associated buildings and/or facilities for the purpose of identifying the presence of potentially contaminating activities (PCAs).

Furthermore, Pinchin conducted an interviews with the current Site owner to determine if any current or historical operations have caused a concern with respect to the environmental condition of the Phase One Property and the surrounding properties within the Phase One Study Area;

2.1 Written Description of Investigation

2.2.1 Summary of Site Reconnaissance

Pinchin formerly completed a Site inspection and a review of surrounding properties within the Phase One Study Area from publicly accessible locations on November 17, 2017 as part of the original Phase One ESA. The initial Site reconnaissance was completed by Pinchin personnel, under the supervision of Pinchin's Qualified Person (QP) overseeing this project. The Phase One Study Area is outlined on Figure 3.

As part of this Update Phase One ESA, Mr. Chris Padgett of Pinchin completed an additional Site reconnaissance on September 4, 2019, under supervision of Pinchin's QP for this project. The Site reconnaissance was documented with notes and photographs. Photographs of some of the features noted during the Site reconnaissance are attached in Appendix II.

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The results of the subsequent Site reconnaissance indicated that the Site is used as agricultural land use. No other substantial changes have been observed to have occurred on the Phase One Property or on the surrounding properties located within the Phase One Study Area from the time of the initial Site reconnaissance that would result in potential subsurface impacts at the Phase One Property. Of note, five monitoring wells were noted on the property located immediately south of the Phase One Property. It is Pinchin's understanding that these monitoring wells were installed as a part of a geotechnical investigation associated with the future development of the surrounding area. As such, no additional PCAs or APECs, beyond those identified in the initial Phase One ESA, have been identified.

3.0 **REVIEW AND EVALUATION OF INFORMATION**

3.1 **Current and Past Uses**

The following table is a summary of the current and past land uses of the Phase One Property:

Year	Name of Owner	Description of Property Use	Property Use	Other Observations from Aerial Photographs, FIPs, etc.
Pre-1802	Crown	Assumed	Agricultural or	The Chain of Title
1802-1831	Isabella Hill	agricultural	Other	determined that the Phase One Property was owned by various individuals from 1798 until 1973. According to aerial photographs, the Phase One Property has never
1831-1835	-1835 Amos Griswold			
1835-1841	William Proudfoot			
1841-1862	James W. Sherrard			
1862-1951	John Philips			
1951-1956	Malcolm C. Patterson	Patterson		
1956-1957	Raymond Anderson			been developed.
1957-1971	Raymond R. Anderson & Mabel E. Anderson			

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Year	Name of Owner	Description of Property Use	Property Use	Other Observations from Aerial Photographs, FIPs, etc.
1971-1973	Sarick Homes (Ontario) Ltd. – 1/3 Inter Panmuir Holdings Ltd., 1/3 Int. Samuel Sarrick Ltd., 1/3 Int. viz Partnership as Pickering Sands Gravel	Assumed agricultural	Agricultural or Other	The Chain of Title determined that the Phase One Property was owned by various individuals from 1798 until 1973. According to aerial photographs, the Phase One Property has never been developed.
1973-1979	Her Majesty the Queen			
1979-2006	Ontario Land Corporation			
2006-2012	Her Majesty the Queen in Right of Ontario as Represented by the Minister of Public Infrastructure Renewal			
2012-2015	Her Majesty the Queen in Right of Ontario as Represented by the Minister of Infrastructure			
2015	Name change to Her Majesty the Queen in Right of Ontario as Represented by the Minister of Economic Development, Employment and Infrastructure			

To the best of Pinchin's knowledge, the Phase One Property has never been developed and has been used as agricultural land since the early 1800s. In summary, the Phase One Property was owned by various individuals from as early as 1802.

It is Pinchin's opinion that the Phase One Property has never been developed. The date of the first developed use of the Phase One Property was determined through a review of aerial photographs, previous reports, and a title search, which was filed for the property to its earliest time of ownership and possible development. No other historical records were available to Pinchin that provided information for determining the date of first developed use of the Phase One Property.

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3.2 Potentially Contaminating Activities

3.2.1 On-Site PCAs

Pinchin's investigation of the Phase One Property during the previous Phase One ESA identified the following on-Site PCA that was considered to represent an APEC at the Phase One Property:

PCA#1: Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents)
 Manufacturing, Processing, Bulk Storage and Large-Scale Applications (At the time of the Site reconnaissance, current agricultural activities were identified at the Phase One Property).

No substantive changes were observed to have been made to the Phase One Property from the time of the initial Site reconnaissance that would result in potential subsurface impacts and, as such, no additional on-Site PCAs have been identified as part of this Update Phase One ESA.

The locations of the on-Site PCAs are shown on Figure 4.

3.2.2 Off-Site PCAs

Additional PCAs were identified within the Phase One Study Area outside of the Phase One Property but is not considered to represent an environmental concern for the Phase One Property due to the distance from the PCA to the Phase One Property, the nature and biodegradability of the contaminants of concern, and or the downgradient/transgradient location of the PCAs relative to the Phase One Property.

No substantive changes were observed to have been made to the Phase One Study Area from the time of the initial Site reconnaissance that would result in potential subsurface impacts and, as such, no additional on-Site PCAs have been identified as part of this Update Phase One ESA.

The locations of the off-Site PCAs are shown on Figure 4.

3.3 Areas of Potential Environmental Concern

The following table summarizes all APECs identified during at the Phase One Property, as well as their respective PCAs, PCOCs and the media which could potentially be impacted:

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Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On- Site or Off- Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
APEC #1 (Historical and Current Agricultural Operations)	Entirety of Phase One Property	Item 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large- Scale Applications	On-Site	OC Pesticides	Soil

Notes:

OC -Organochlorine

The potential for environmental impact to the Phase One Property was based on a combined probability for a source to contaminate, and the contaminants ability for migration on, or to the Phase One Property. This evaluation included factors such as distance of a PCA from the Phase One Property, groundwater flow direction, mobility of PCOCs and potential for natural attenuation and lithology.

The PCOCs are APEC specific and are determined based on several sources of information including, but not limited to, Pinchin's experience with environmental contamination and hazardous substances, common industry standards for analysis of such contaminants and point sources, literature reviews of PCOCs and associated hazardous substances and evaluations of certain contaminant's mobility and susceptibility for migration in the subsurface.

A plan showing the location of the PCAs and Phase One Study Area is attached as Figure 3. The locations of the APEC on the Phase One Property is shown on Figure 5.

The Phase Two ESA was completed by Pinchin on June 18, 2018 and included the advancement of twelve boreholes at the Phase One Property. The boreholes were advanced to a depth of approximately 0.3 metres below ground surface (mbgs). Select soil samples collected from each of the borehole locations were submitted for laboratory analysis of OC pesticides package which includes the analysis of polychlorinated biphenyls.

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Based on Site-specific information, the applicable regulatory standards for the Phase Two Property were determined to be the *Table 2 Standards* for residential land use and medium and fine-textured soils. The laboratory analytical results for the submitted soil samples indicated that all reported concentrations for the parameters analyzed met the corresponding *Table 2 Standards*.

3.4 Updated Phase One Conceptual Site Model

A conceptual site model (CSM) was created to provide a summary of the findings of the Update Phase One ESA. The Phase One CSM is summarized in Figures 1 through 5, which illustrate the following features within the Phase One Study Area, where present:

- Existing buildings and structures;
- Water bodies located in whole or in part within the Phase One Study Area;
- Areas of natural significance located in whole or in part within the Phase One Study Area;
- Drinking water wells located at the Phase One Property;
- Land use of adjacent properties;
- Roads within the Phase One Study Area;
- PCAs within the Phase One Study Area, including the locations of tanks; and
- APECs at the Phase One Property.

The following provides a narrative summary of the Update Phase One CSM:

- The Phase One Property is an irregularly shaped parcel of land approximately 48.3 acres (19.55 hectares) in size located approximately 500 m south of Highway 407, approximately 900 m west of Elsa Storrey Avenue, and approximately 600 m north of Whitevale Avenue. The Phase One Property consists of vacant agricultural land. There is no record of industrial use or of a commercial use (e.g., garage, bulk liquid dispensing facility or dry cleaner) that would require classifying the Phase One Property as an enhanced investigation property.
- No water bodies were identified within the Phase One Study Area. The nearest water body is Urfe Creek, which is located approximately 50 m east of the Phase One Property;
- No areas of natural significance were identified within the Phase One Study Area.
- No drinking water wells were located on the Phase One Property.
- The adjacent properties within 250 m of the Phase One Property consist of agricultural land and/or forested land.

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A total of two PCAs were identified within the Phase One Study Area, consisting of one PCA at the Phase One Property and one PCA within the Phase One Study Area, outside of the Phase One Property. As shown on Figure 4, the off-Site PCA is the pesticide use associated with agricultural land use on adjacent properties, while the on-Site PCA is the use of pesticides on the Phase One Property. Groundwater flow within the Phase One Study Area is interpreted to be generally towards the southeast, with flow to the southwest in the northwest portion and to the northeast in the eastern portion. The off-Site PCA are not considered to result in an APEC at the Phase One Property based on the nature of the contaminants and their limited mobility in surface soils. Figure 5 provides a detailed summary of the APEC and associated PCAs and COPCs.

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- There are no known underground utilities at the Phase One Property.
- A review of the available physiographical data indicates that the Phase One Property and the surrounding properties located within the Phase One Study Area are located within glaciofluvial deposits of drumlinized till plains, beaches, and sand plains, with the primary native material consisting of silty sand to sand and gravelly sand and gravel. Bedrock is expected to consist of shale, limestone, dolostone and siltstone, of the Blue Mountain Formation, Billings Formation, Collingwood Member, and Eastview Member. The topography is considered to be mainly flat to rolling low local relief with dry surface water drainage conditions. During previous on-Site environmental investigations, the soil stratigraphy was observed to consist of silty sand, sandy silt and/or clayey silt till with trace to some gravel, cobbles and boulders.
- The unconfined groundwater beneath the Phase One Property is expected to generally flow to the southeast, with flow to the southwest in the northwest portion and to the northeast in the eastern portion.

There were no deviations from the Phase One ESA requirements specified in O. Reg. 153/04 or absence of information that have resulted in uncertainty that would affect the validity of the Phase One CSM.

4.0 CONCLUSIONS

Pinchin conducted this Update Phase One ESA in order to satisfy the requirements of O. Reg. 153/04. No additional PCAs or APECs beyond that which was previously identified in the 2018 Pinchin Phase One ESA.

The conclusions of this Update Phase One ESA represent the best judgment of the assessor and QP based on the conditions of the Phase One Property observed since completion of the 2018 Pinchin Phase

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One ESA Report. The combined 2018 Pinchin Phase One ESA Report and the Update Phase One ESA constitute the Phase One ESA reporting requirements necessary to support the filing of an RSC in accordance with O. Reg. 153/04.

The Update Phase One ESA of the property located at Parts of Lot 21 and 22, Concession 5 in Pickering, Ontario has been conducted in accordance with O. Reg. 153/04, under the supervision of a QP.

4.1 Limitations

This Update Phase One ESA was performed in order to identify potential issues of environmental concern associated with the Phase One Property located at Parts of Lot 21 and 22, Concession 5 in Pickering, Ontario (Phase One Property) since the time of the initial Site reconnaissance in November 17, 2017. This Update Phase One ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific client requests, as applicable to this Phase One Property.

This report was prepared for the exclusive use of Mattamy Development Corporation (Client), subject to the conditions and limitations contained within the duly authorized proposal. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third parties. If additional parties require reliance on this report, written authorization from Pinchin will be required. Such reliance will only be provided by Pinchin following written authorization from Client. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed.

Pinchin will not be responsible for any consequential or indirect damages. Pinchin will only be held liable for damages resulting from negligence of Pinchin. Pinchin will not be liable for any losses or damage if Client has failed, within a period of two years following the date upon which the claim is discovered within the meaning of the Limitations Act, 2002 (Ontario), to commence legal proceedings against Pinchin to recover such losses or damage.

The information provided in this report is based upon analysis of available documents, records and drawings, and personal interviews. In evaluating the Phase One Property, Pinchin has relied in good faith on information provided by other individuals noted in this report. Pinchin has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. Pinchin accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted, or contained in reports that were reviewed.

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Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

We trust that the information provided in this report meets your current requirements. If you have any questions or concerns, please do not hesitate to contact the undersigned.

Pinchin Ltd.

Prepared by: Reviewed by:

Amber Harvey, B.Sc. Project Technologist 289.659.1867 aharvey@pinchin.com Francesco Gagliardi, C.E.T., LET, QP_{ESA} Operations Manager, Regional Practice Lead 905.577.6206 ext. 1719 fgagliardi@pinchin.com

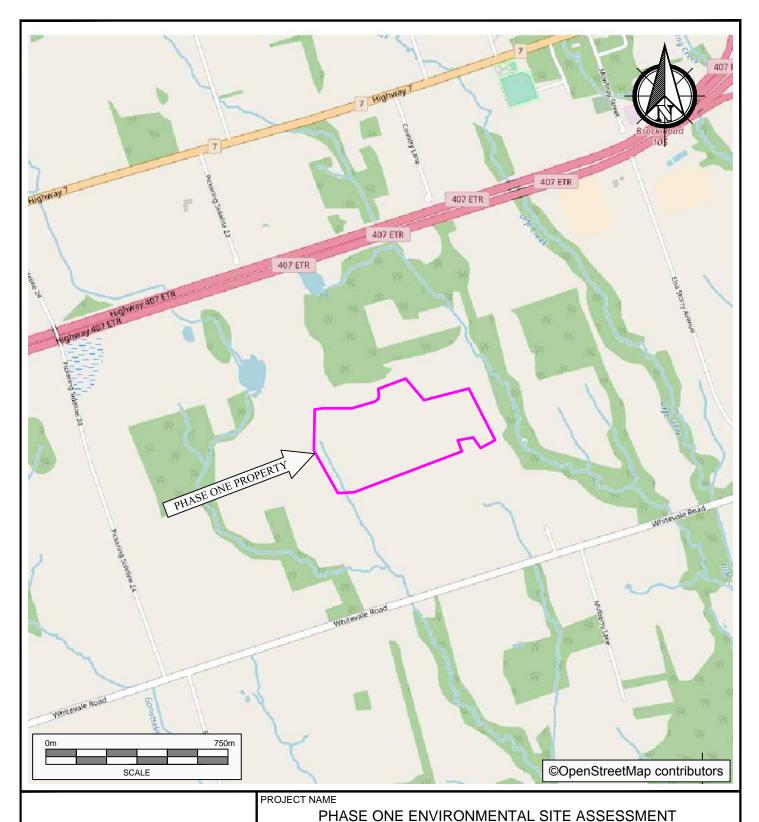
Attachments: Appendix I – Figures

Appendix II - Photographs

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APPENDIX I Figures





SCALE

AS SHOWN

CLIENT NAME MATTAMY DEVELOPMENT CORPORATION PROJECT LOCATION PART OF LOTS 21 AND 22, CONCESSION 5, PICKERING, ONTARIO FIGURE NAME KEY MAP

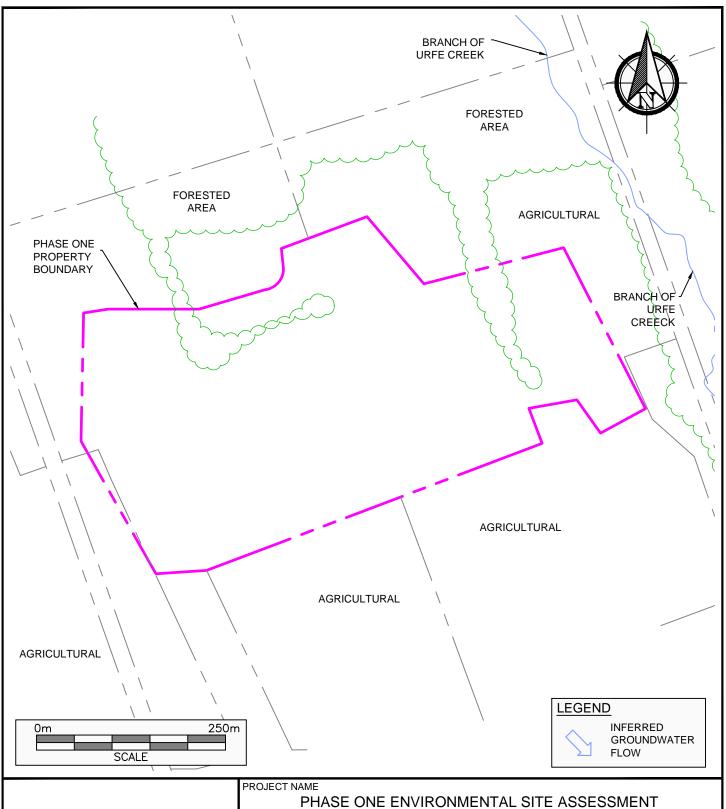
DATE

MARCH 2020

1

PROJECT NO.

213894.001



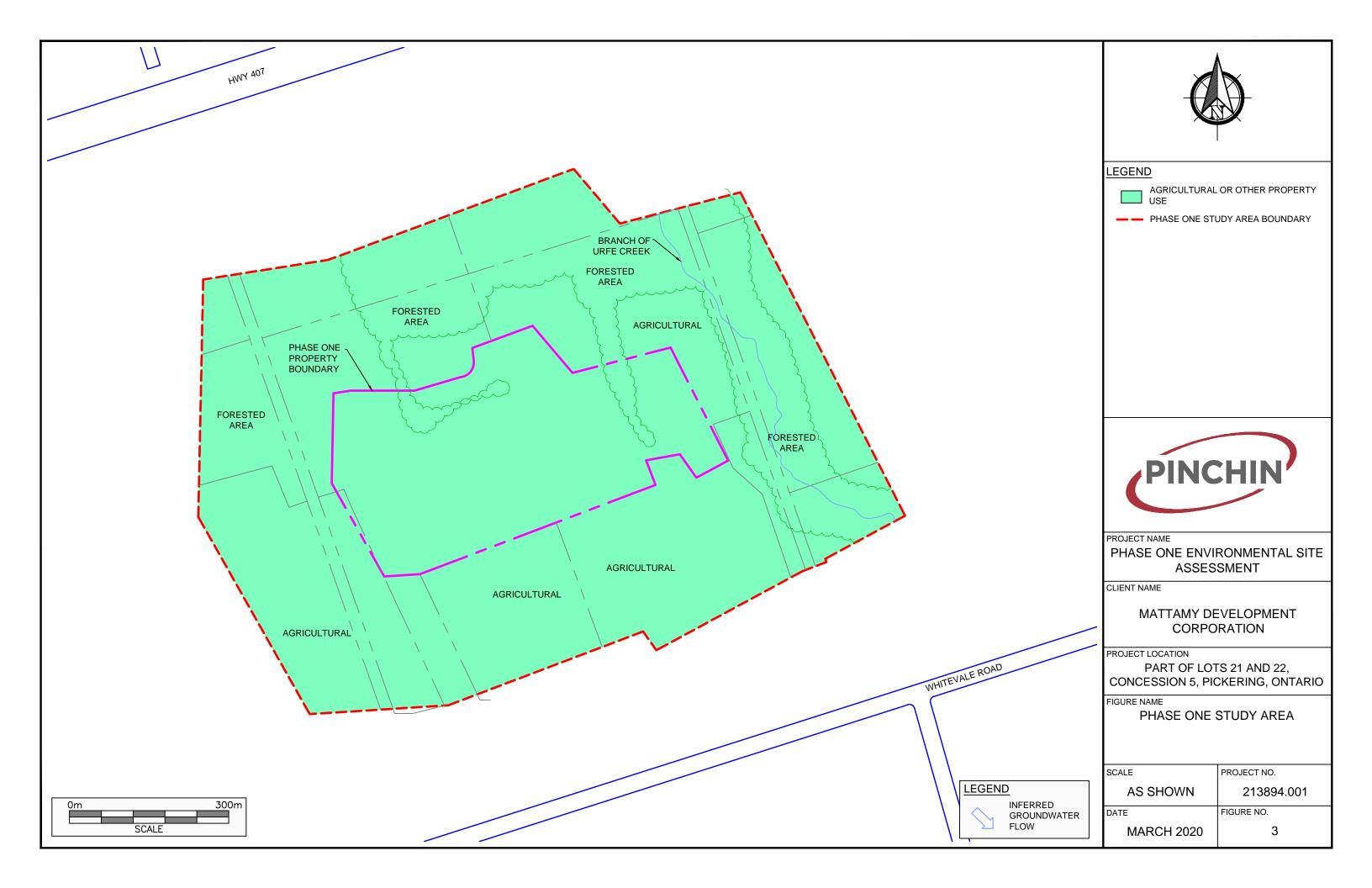


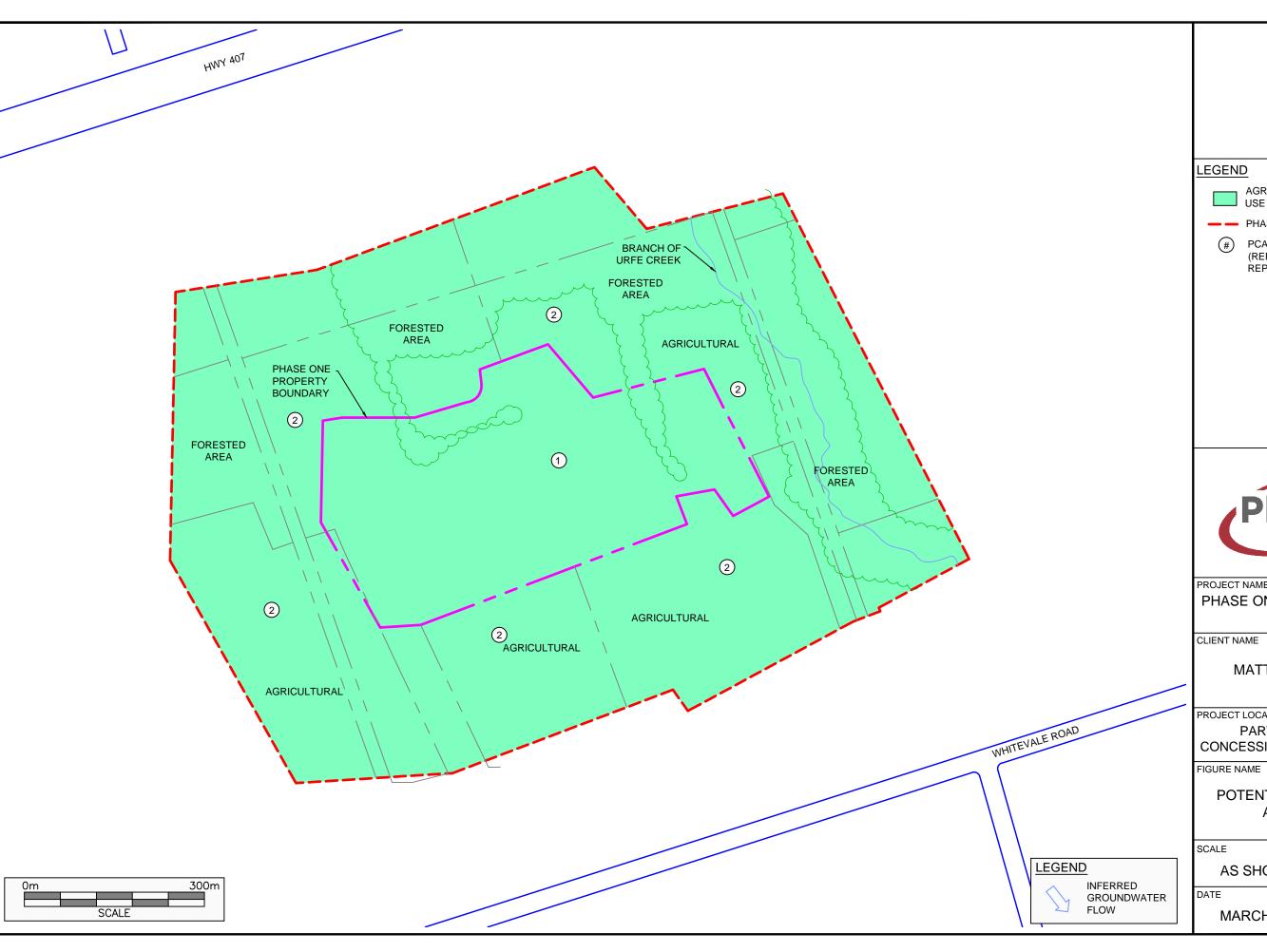
PHASE ONE ENVIRONMENTAL SITE ASSESSMENT CLIENT NAME

MATTAMY DEVELOPMENT CORPORATION

PROJECT LOCATION PART OF LOTS 21 AND 22, CONCESSION 5, PICKERING, ONTARIO

FIGURE NAME				
PH	IASE TWO PROPER	TY		
SCALE PROJECT NO. DATE				
AS SHOWN	213894.001	MARCH 2020	_	







AGRICULTURAL OR OTHER PROPERTY USE

— — PHASE ONE STUDY AREA BOUNDARY

PCA LOCATION (REFER TO SECTION 6.4 OF THE REPORT FOR DESCRIPTION OF PCAS)



PROJECT NAME

PHASE ONE ENVIRONMENTAL SITE **ASSESSMENT**

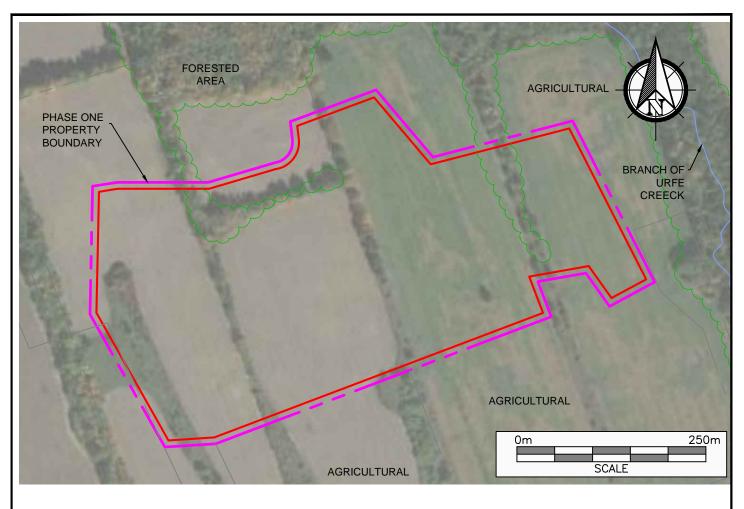
MATTAMY DEVELOPMENT CORPORATION

PROJECT LOCATION

PART OF LOTS 21 AND 22, CONCESSION 5, PICKERING, ONTARIO

POTENTIALLY CONTAMINATING ACTIVITIES (PCAs)

SCALE	PROJECT NO.	
AS SHOWN	213894.001	
DATE	FIGURE NO.	
MARCH 2020	4	



Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Phase One Property	Potentially Contaminating Activity	Location of PCA (On- Site or Off- Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil and/or Sediment)
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LEGEND

AREA OF
APEC POTENTIAL
ENVIRONMENTAL
CONCERN



APEC#1





INFERRED GROUNDWATER FLOW



PROJECT NAME

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME

MATTAMY DEVELOPMENT CORPORATION

PROJECT LOCATION PART OF LOTS 21 AND 22, CONCESSION 5, PICKERING, ONTARIO

FIGURE NAME
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

SCALE PROJECT NO. 213894.001

DATE MARCH 2020

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APPENDIX II Photographs



Photo 1 – View of the Phase One Property looking north.



Photo 2 – View of the Phase One Property looking east.

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Photo 3 – Monitoring well observed on the property located south of the Phase One Property.



Photo 4 – Subdivision development located adjacent to the south of the Phase One Property.

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