



Remedial Action Plan

70 Mississauga Road South, Mississauga,
Ontario

March 1, 2018

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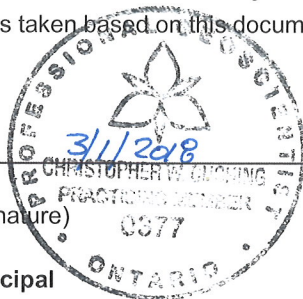
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Sign-off Sheet

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Introduction
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1.0 INTRODUCTION

Port Credit West Village Partners Inc. (PCWVP) retained Stantec Consulting Ltd. (Stantec) to prepare a Remedial Action Plan (RAP) to address identified impacts to soil and groundwater at the former Imperial Oil Lands located at 70 Mississauga Road South, in Mississauga, Ontario (the Site).

A Phase Two Environmental Site Assessment (ESA) was completed by Stantec for PCWVP to characterize soil and groundwater at areas of potential environmental concern (APEC) identified in a Phase One ESA (Stantec, 2017b), and to further assess the presence, location, and concentrations of soil and groundwater contaminants of concern (COC) previously identified by others (Barenco, 2010), (Exp, 2015a), and (Exp, 2015b). The results of the Stantec Phase Two ESA have been used to support the development of this RAP to address soil and groundwater conditions at the Site, the execution of a targeted remedial program, and the completion of Ontario Regulation (O.Reg.) 153/04 Tier 2 and Tier 3 Risk Assessments and associated Risk Management Plans (RMP).

The most recent property use at the Site as defined by O.Reg. 153/04 was industrial. The proposed future property use at the Site is a combination of residential, parkland, commercial, and community (roadways). Records of Site Conditions (RSCs) will be filed for all lands included in the proposed development. Although O.Reg. 153/04 would require mandatory filing of RSCs for the areas of the Site to be re-developed to residential and parkland property uses, RSCs for future community use (public roadways) are required by the City of Mississauga in the case where land is to be conveyed to the City. PCWVP have also elected to file RSCs for land that will be developed to a commercial and community (private roadway) property use.

1.1 SUMMARY OF ENVIRONMENTAL APPROACH

To facilitate re-development of the Site, soil and groundwater impacted with COC primarily associated with petroleum hydrocarbons (PHCs) will be managed using a combination of targeted remedial excavation with off-site disposal, risk assessment, risk management, and soil management.

This remedial approach is an integrated remedial strategy, where the aspects of the built-form have been designed to coordinate with the remediation plan. As an example, where deeper targeted remedial excavation is required, buildings supporting deeper underground parking structures have been designed to optimize the efforts associated with excavation. Similarly, all proposed buildings have been designed to incorporate underground parking which will act as a vapour intrusion mitigation measure in the risk assessment process. Further, the remedial approach has integrated soil management plans throughout all phases of the proposed development to optimize the sustainable reuse of soils within the site in grading, landforms, and fill caps, therefore minimizing greenhouse gas emissions associated with trucking of soils on and off the property.

Remedial objectives for soil and groundwater will be established by deriving property specific standards (PSS) in multiple MOECC O.Reg. 153/04 Risk Assessments. The application of these PSS to the site will allow more sustainable reuse of soils within the property, further reducing the volumes of soils requiring offsite disposal and reducing greenhouse gas emissions associated with transportation of these materials.

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Initial activities will include a targeted remedial excavation and groundwater verification program that will include off-site disposal of soil that is thought to represent a continuing source for impact to soil and groundwater at the Site. The period of targeted remediation and associated groundwater verification was initiated in December 2017 and will continue for most of the Site into 2019. Targeted remedial excavation in the southeast area of the Site (referenced as Block U on **Figure No. 3, Appendix A**) will be coordinated with construction and excavation of deep foundations required for underground parking.

Preparation and submission of four O.Reg. 153/04 Risk Assessments will occur during the period of targeted remedial excavation (2017 to 2019). Considering distribution and concentrations of identified impacts, site characteristics, and planned built-form of the development, it is anticipated that one of the submitted risk assessments can be completed as an O.Reg.153/4 Tier 2 Modified Generic Risk Assessment (MGRAs). Site conditions and/or planned built-form (e.g., groundwater impacts in unweathered shale bedrock, site characteristics, or proposed construction depths) require the remaining three Risk Assessments be completed as O.Reg. 153/04 Tier 3 Risk Assessments. Initial risk assessment submissions to the MOECC are anticipated during the second quarter of 2018. MOECC approval of the risk assessments are anticipated between late 2019 to late-2020. As differing site conditions may be observed during the targeted remedial excavation phase of the RAP, the final number and boundaries of each of Risk Assessment parcel may require revision as the remediation program progresses.

Conceptually, it is anticipated that the Official Plan and Zoning By-Law Amendments with local and regional governments would be in place in advance of the completion of the targeted remediation and risk assessment approval, however soil and groundwater verification associated with the targeted remediation would have been initiated for much of the Site and risk assessment reviews would have begun with the MOECC. Once planning approvals have been received, site plan approvals, and subsequent building permits would be requested. It is currently anticipated that building permits for shoring and foundations would be requested before risk assessments have been approved by the MOECC, and prior to RSC filing. Similarly, roadways and supporting utilities initiating at Mississauga Road and looping between Port Street and Lake Street extensions would be constructed prior to RSC-filing to support initial stages of development. During below-grade construction, any remaining soil that exceeds derived PSS for the Site that are within building footprints or beneath roadways will be excavated and disposed off-site. Final soil verification prior to RSC filing will be completed during the period of below-grade construction.

It is expected that four MOECC Certificates of Property Use (CPU) will be required for the Site (one CPU for each Risk Assessment). Each CPU will summarize requirements for risk management that were recommended in the approved Risk Assessments.

RSCs for the lands associated with the Risk Assessments can be prepared and filed with the MOECC once all soil verification associated with foundation excavation been completed. It is currently anticipated that a minimum of four RSCs will be filed (one for each Risk Assessment), but construction phasing may require the filing of multiple RSC per Risk Assessment parcel.

1.2 SITE DESCRIPTION

The Site is in an area of mixed commercial and residential land use on the southwestern corner of Mississauga Road South and Lakeshore Road West in Mississauga, Ontario. The Site is bounded by Lakeshore Road West to the northwest, Mississauga Road South to the northeast, Lake Ontario to the southeast, and residential dwellings to the southwest along Pine Avenue South. The Site has an area of approximately 29.4 hectares (72.8 acres).

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Prior to the completion of the Phase One and Two ESAs by Stantec, the environmental conditions of the Site were previously evaluated by the former owner (Imperial Oil Limited) through the completion of several ESAs since petroleum refining operations ceased in 1985. Phase One and Two ESAs were conducted from 2008 to 2015 (Barenco, 2010), (Exp, 2013), (Exp, 2015a), and (Exp, 2015b)

The Site is currently vacant, with notable features that include a vacant car wash and kiosk building on the northern corner (former gasoline service station property), a vacant fire hall building, a former American Petroleum Institute (API) separator, former shale extraction pit remnant from historical brickworks (Shale Pit), and a portion of the City of Mississauga Waterfront Trail. **Figure No. 1 (Appendix A)** presents a topographic map depicting the Site location. **Figure No. 2 (Appendix A)** presents a site plan showing the Site features prior to the initiation of the 2017 remedial activities including the buildings, monitoring well locations, underground utilities, APECs, as well as the adjacent properties.

Additional information associated with the industrial history of the Site and surrounding area is included in the Stantec Phase One ESA (Stantec, 2017a). However, two specific Site features associated with historical pre-petroleum refining activity have likely influenced the distribution of Petroleum Hydrocarbon impacts.

- A former shale pit that was excavated as a source for material to support a brickworks that operated at the Site until late-1920's/early-1930's was located in the central area of the Site. A portion of the shale pit is currently observed at the Site in the form of a pond. Excavation associated with the shale pit extended to the overburden/bedrock contact from approximately 3 m below the ground surface (BGS), to more than 6 m BGS. The northern portion of the original shale pit was backfilled during the period of petrochemical refining (1933 to 1985). Generally, concentrations of contaminants associated with petroleum hydrocarbons are higher in this area of the Site when compared to areas proximate to Site boundaries. Further, liquid petroleum hydrocarbons (LPH) have been observed on the groundwater table in select monitoring wells installed in the backfilled portion of the shale pit.
- A former harbour inlet was also historically present in the southeast area of the Site and supported the brickworks in operation until late-1920's/early-1930's. Although the harbor inlet remained as a feature at the Site during the period of petrochemical refining (1933 to 1985), it was never utilized. The feature was backfilled during site decommissioning activities completed by 1995. From information collected during Phase Two ESA programs, utilized backfill material included concrete and soil generated during decommissioning.

1.3 FUTURE PROPERTY USE

Future property uses for the Site will include residential, parkland, commercial, and community (roadways). The proposed development plan for the Site is attached as **Figure No. 3 (Appendix A)**. Stantec understands that portions of the Site associated with parkland and specific public roadways will be conveyed to the City of Mississauga following filing of RSCs. A summary of parcels of land that will remain privately owned and those that will be conveyed to the City of Mississauga (public parks and roadways) are shown on **Figure No. 4 (Appendix A)**.

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2.0 REMEDIAL OBJECTIVE

The objective of the remedial approach for the Site is to address impacted soil and groundwater exceeding generic Table 3 SCS in a manner consistent with the requirements of O.Reg. 153/04. This remedial objective will be achieved through completion of a targeted remedial excavation, soil management, O.Reg. 153/04 risk assessment, and implementation of risk management measures (RMM) that will permit the future property uses. As portions of the Site will be conveyed to the City of Mississauga (parkland and select roadways), additional requirements associated with risk management beyond those required by O.Reg. 153/04 were considered in the development of the Remedial Objective for the future public lands. The Remedial Objective for the future public lands reflects the guiding principles established by the City of Mississauga and provided to PCWVP in a memorandum dated December 18, 2017 (Mississauga, 2017).

2.1 REGULATORY FRAMEWORK

The applicable MOECC generic SCS for the proposed future use of the Site were considered the MOECC Table 3 SCS for residential/parkland/institutional land use in a non-potable groundwater condition, with medium to fine textured soil (MOECC, 2011). Although redevelopment of the Site will include commercial and community (roadways) property uses, the use of residential/parkland/institutional Table 3 SCS were considered at all locations since they are equally or more conservative (i.e., stringent) than the industrial/commercial/community Table 3 SCS.

The applicable MOECC generic SCS for the locations of the Site within 30 m of Lake Ontario were considered to be the MOECC Table 9 Full Depth Generic SCS for use within 30 metres (m) of a water body in a non-potable groundwater condition. Development within 35 m of the water's edge of Lake Ontario is regulated by the Credit Valley Conservation Authority. The limit of this regulated area is shown on **Figure No. 2 (Appendix A)** and identified the portion of the Site where the Table 9 SCS will be applied.

The applicable SCS were selected based on a review of the following site-specific characteristics:

- The 2013 Exp (Exp, 2013) and 2017 Stantec (Stantec, 2017a) Phase One ESAs did not identify areas of natural significance on or adjacent to the Site. During Exp's Phase Two ESAs (Barenco, 2010) (Exp, 2015a) (Exp, 2015b) and Stantec's Phase Two ESA (Stantec, 2018), surface soil and subsurface soil samples were collected and analyzed for pH. The pH results were within acceptable ranges of 5 to 9 for surface soils and 5 to 11 for subsurface soils. Therefore, the Site is not environmentally sensitive as per the definitions provided in Section 41 of O.Reg.153/04.
- During Stantec's 2017 environmental due diligence program (Stantec, 2017a), the depth to weathered bedrock ranged from approximately 2.3 m to 5.5 m below ground surface (BGS) (average depth was 3.3 m BGS). The former shale pit located in the southwestern portion of the Site is not considered a water body since it was used as a storm water management pond for historical operations at the site. O.Reg.153/04 defines a water body as "a permanent stream, river, or similar watercourse or a pond or lake, but does not include a pond constructed on the property for the purpose of controlling surface water drainage". Thus, no water bodies were observed at the Site. However, portions of the Site are located within 30 m of a water body, as Lake Ontario is located immediately southeast of the Site. Based on completed subsurface investigations and a review of available mapping, the Site is not a shallow soil property.
- Grain size distribution analyses were completed during Exp's Phase Two ESAs (Barenco, 2010) (Exp, 2015a) (Exp, 2015b). Thirty-one of the 34 analyzed soil samples had less than 50 percent by mass of particles that were 75 micrometres or larger in mean diameter. Although three soil samples had 52 percent pass of particles that

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were 75 micrometres or larger in mean diameter, the dominant soil texture at the Site is considered medium/fine. The soil texture was confirmed based on consistent stratigraphy observed during Stantec's 2017 drilling programs (Stantec, 2017a), as well as grain-size analysis completed by Stantec as part of a geotechnical investigation.

- Potable water obtained from Lake Ontario is supplied to properties located, in whole or in part, within 250 m of the boundaries of the Site through municipal drinking water system, as defined in the Safe Drinking Water Act, 2002 (MOECC, 2002). Based on the information reported in the Phase Two ESA (Exp, 2015a), Supplemental Phase Two ESA (Exp, 2015b), and Stantec's Phase One ESA (Stantec, 2017b) there are no active private water wells within 1 kilometre (km) of the Site. In addition, the Site is not located in an area designated in a municipal official plan as a wellhead protection area or other designation identified by the municipality for the protection of groundwater. Considering the above information, the non-potable groundwater SCS available in O.Reg. 153/04 were considered applicable at the Site.

The proposed future use of the Site will include residential, commercial, community (roadways), and parkland property uses. Under Section 3(2) of O. Reg. 153/04, residential/parkland is the more sensitive of these land uses; therefore, the Table 3 SCS for residential/parkland/institutional land use were considered applicable.

3.0 SOIL AND GROUNDWATER INVESTIGATIONS

A Phase Two ESA was completed by Stantec to support the future redevelopment of the Site to a residential, parkland, commercial, and community (roadway) property use. The objective of the Phase Two ESA was to characterize soil and groundwater at areas of potential environmental concern (APEC) identified in the Phase One ESA (Stantec, 2017b) and to further assess the presence, location, and concentration of contaminants of concern (COCs) previously identified by others (Barenco, 2010), (Exp, 2013), (Exp, 2015a), and (Exp, 2015b)) in soil and groundwater at the Site.

Following identification and review of Potential Contaminating Activities (PCA) as part of the completed Phase One ESA, Stantec identified fifteen APECs at the Site (Stantec, 2017b). The locations of the APECs and associated PCAs are shown on **Figure No. 2 (Appendix A)** and summarized below.

APEC 1: Located along the northwestern property boundary. A historical commercial auto body shop (PCA 10 in Table 2, Schedule D, O.Reg. 153/04) formerly operated in the northern corner of the Site, and historical commercial auto body shops operated adjacent to the Site at 125 High Street; 72 Wesley Avenue; and 200, 212, 266, 280, and 286 Lakeshore Road West.

APEC 2: Located in the western corner of the Site. 321 Lakeshore Road West (located approximately 70 m west of the Site), historically operated as a vehicle repair shop (PCA 10) with associated underground storage tanks (USTs).

APEC 3: The historical operation of a brick manufacturing facility (PCA 12) occurred within the eastern portion of the Site.

APEC 4: Includes the entire Site. An oil and petrochemical refinery (PCA 14) operated on the Site between 1933 and 1985.

APEC 5: Located along the northwestern property boundary. 250 Lakeshore Road West (located approximately 25 m northwest of the Phase One Property), historically operated as a distribution terminal and refinery products loading area with various storage tanks (PCA 14).

APEC 6: Located on the northern corner of the Site. A gasoline service station with associated USTs (PCA 28) was formerly located on the northern corner of the Site.

APEC 7: Located on the northeastern portion of the Site. A historical UST (PCA 28) was observed on the roadway of Bay Street in front of an unknown building identified as 31 Bay Street (located approximately 215 m northeast of the Site) on the 1928 FIP.

APEC 8: Located along the northwestern Site boundary. A historical gasoline service station with associated USTs (PCA 28) historically operated 25 m northwest of the Site at 182 Lakeshore Road West.

APEC 9: Located within the northern corner of the Site. 150 Lakeshore Road West (located approximately 70 m north of the Site), historically operated as a gasoline service station with associated USTs (PCA 28).

APEC 10: Fill material of unknown quality was identified across the entire Site.

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APEC 11: Historical rail spurs (PCA 46), were located within the northwestern, southeastern, and central portions of the Site.

APEC 12: Located along the northwestern Site boundary. Historical operation of a dry cleaner located approximately 130 m northwest of the Site at 228 Lakeshore Road West.

APEC 13: Located on the northern corner of the Site. Historical operation of a dry cleaner (PCA 37) located approximately 70 m north (150 Lakeshore Road West) of the Site.

APEC 14: Located on the eastern corner of the Site. Historical landfilling (PCA 58) occurred immediately east of the Site at J.C. Saddington Park.

APEC 15: Historical PCB storage (PCA 55) reportedly occurred within the northeastern portion of the Site.

Consistent with a recommendation within the Phase One ESA, soil and groundwater at the Site was subsequently characterized for COC associated with the APEC/PCAs identified above. The objective of the completed Phase Two ESA was to characterize soil and groundwater at the Site in a manner consistent with the requirements of O.Reg. 153/04, including Schedule E.

3.1 SITE CHARACTERISTICS

General stratigraphy of the Site consisted of a soil profile of fill and native material overlying shale bedrock. The soil profile generally consisted of ground surface cover consisting of vegetation/topsoil or asphalt; underlain by fill material of various soil textures, underlain by sandy silt with silty clay/clayey silt layers and discontinuous sand layers.

Fill material was encountered at depths ranging from surface to approximately 4 m BGS, with thickness generally ranging from 1 m to 2 m. Native soil (i.e. sandy silt with silty clay layers) was encountered at general depths ranging from 1 m to 5 m BGS with an estimated average thickness of 2.5 m. The Shale Pit in the southwest portion of the Site at one time extended approximately 100 m to the north of the current configuration. This portion of the Shale Pit was backfilled prior to 1985. Thus, soils in the area of the Site north of the Shale Pit were encountered to a depth of approximately 11 m BGS.

The underlying geology at the Site is comprised of the Georgian Bay Formation, Meaford-Dundas beds of shale, and limestone of the Upper Ordovician period (MNDM, 1991a). Shale bedrock was observed at approximate depths ranging from 2.3 m to 6 m BGS, with rock quality generally transitioning from weathered to unweathered with increasing depth. Moderately weathered shale was encountered in the previously backfilled area north of the existing Shale Pit at an approximate depth of 11 m BGS.

The inferred direction of groundwater flow in both the overburden and bedrock was generally towards the south/southeast towards Lake Ontario. Areas of fill material and/or abandoned utilities may influence the elevation of shallow groundwater present on the Site (example: north of the Shale Pit). The presence of these subsurface features has likely created perched groundwater conditions over much of the Site. Perched groundwater conditions will be sensitive to seasonal and meteorological effects. The variable profile of the overburden groundwater surface suggests that both perched and unconfined groundwater conditions are present.

3.2 SOIL AND GROUNDWATER CHARACTERIZATION

The completion of the Phase Two ESA at the Site included characterization of soil and groundwater at APECs for potential COC parameters identified in the Phase One ESA. The Site is not considered a sensitive site as defined by O.Reg.153/04 s.41. In addition, the Site does not contain a watercourse and is not classified as a shallow soil property. However, portions of the Site are located within 30 m Lake Ontario.

A summary of the completed Stantec Phase Two ESA has been prepared under separate cover (Stantec, 2018). As part of the Phase Two ESA, soil and groundwater samples were submitted for laboratory analysis of potential COCs, which included volatile organic compounds (VOCs), petroleum hydrocarbon fractions 1 to 4 (PHC F1 to F4), semi-VOCs (SVOCs) (including polycyclic aromatic hydrocarbons (PAH), chlorophenols (CPs), acid/base neutrals (ABNs)), polychlorinated biphenyls (PCBs), metals and general chemistry parameters.

The following sections provide a general summary of the identified soil and groundwater concentrations that exceeded Table 3 SCS, their location at the Site, and a summary of COC.

3.2.1 Soil Characterization – Areas of Identified Soil Impact

The primary locations of the Table 3 SCS soil exceedances for the associated parameter groupings were in the following areas (as identified on **Figure No. 2 (Appendix A)**):

- **BTEX, PHC F1 to F4, and PAHs:** widespread across the Site in former tank farms and refinery processing areas (APECs 1 to 5, 7, 8, 10, 11, 14, and 15)
- **VOCs:** widespread across the Site in former tank farms, refinery processing areas, and administration area (APECs 1 to 5, 7, 8, 10 to 12, and 15)
- **ABN:** former southern tank farm (APECs 4 and 10)
- **Metals, EC, and SAR:** widespread across the Site in former tank farms, refinery processing area, and harbor inlet (APECs 1, 3 to 5, 7, 8, 10, 11, 14, and 15)
- **PCBs:** Localized in the Shale Pit backfill extension, administration area, and former northeast tank farm (APECs 1, 3 to 5, 7, 8, 10, and 15)

BTEX, PHC, VOC, PAH, ABN, metal, PCB, and EC/SAR parameters have been identified in soil at the Site at concentrations greater than the Table 3 SCS. The source of these impacts is dependent on which APEC the sampling location is located within. Although the primary source of identified impacts is likely associated with the former on-site petrochemical refinery operation, other the possible sources could be a result of one or more of the following: PCA 10 (Commercial Auto Body Shops), PCA 12 (Concrete, Cement, and Lime Manufacturing), PCA 14 (Crude Oil, Refining, Processing, and Bulk Storage), PCA 28 (Gasoline and Associated Products Stored in Fixed Tanks), PCA 30 (Importation of Fill Material of Unknown Quality), PCA 46 (Rail Yards, Tracks, and Spurs), PCA 37 (Operation of Dry Cleaning Equipment), PCA 55 (Transformer Manufacturing, Processing, and Use), and PCA 58 (Waste Disposal and Waste Management).

3.2.1.1 Contaminants of Concern in Soil

Considering results of the completed soil characterization, the following parameters were considered COCs in soil at the Site:

- BTEX

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- PHC F1 to F4
- Chlorobenzene, chloroform, ethylene dibromide, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichloropropane, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, trichloroethene, 1,2-dichloroethane, and hexane
- Acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b/j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, methyl naphthalene, naphthalene, phenanthrene, and pyrene
- 1,1-biphenyl and bis(2-ethylhexyl) phthalate
- Antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, thallium, vanadium, and zinc
- EC and SAR
- PCBs

3.2.2 Groundwater Characterization – Areas of Groundwater Impact

The primary locations of the Table 3 SCS groundwater exceedances for the associated parameter groupings were in the following areas (as identified on **Figure No. 2 (Appendix A)**):

- **BTEX and PHC F1 to F4:** widespread across the Site in areas of the former tank farms, refinery processing, and rail tanker loading areas (APECs 1, 2, 4, 5, 8, 10, and 11)
- **PAHs:** in the refinery processing area (APECs 4 and 10)
- **Sodium and Chloride:** exclusively in unweathered bedrock groundwater in the refinery processing area and the former west tank farm area (APECs 3, 4, 10, and 11). As sodium and chloride impacts were not observed in overburden groundwater, it is possible that observed concentrations are associated with background conditions rather than an anthropogenic origin.

The primary source of observed BTEX, PHC F1 to F4, and PAH impact is likely associated with the former on-site petrochemical refining operation.

During sampling events associated with the collection of groundwater for laboratory characterization, a measurable thickness of LPH was observed in five monitoring wells located in the area to the north of the Shale Pit where historical backfilling had been completed.

3.2.2.1 Contaminants of Concern in Groundwater

Considering results of the completed soil characterization, the following parameters were considered COCs in groundwater:

- Benzene
- Xylene
- PHC F1 to F4
- Sodium and chloride
- Bis(2-ethylhexyl) phthalate, diethyl phthalate, and dimethyl phthalate
- Acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b/j)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno (1,2,3-cd)pyrene

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4.0 REMEDIAL APPROACH

Soil and groundwater impacted with COC will be managed consistent with the requirements of O.Reg. 153/04 using a combination of targeted remedial excavation with off-site disposal, risk assessment, risk management, and soil management. This section will summarize the various elements of the remedial approach including:

- The completion of Tier 2 and Tier 3 O.Reg. 153/04 Risk Assessments and associated RMPs;
- Anticipated RMMs that will be recommended to mitigate exposure to any residual concentrations of COC in soil and/or groundwater;
- Targeted remedial excavation and soil management programs that will address COC soil and groundwater impacts that are present at concentrations that would represent an unacceptable risk to future receptors at the Site; and
- Approximate timeline for completion of the remedial approach.

The development of the remedial approach considers that portions of the Site will be conveyed to the City of Mississauga in the form of parks and public roadways.

O.Reg. 153/04 Risk Assessments will be prepared and submitted to the MOECC for review concurrent with the completion of the targeted remedial excavation program. It is expected that MOECC approval of submitted Risk Assessments will generally coincide with the completion of groundwater verification programs associated with targeted remedial excavation. The targeted remedial excavation program for the majority of the Site was initiated in late-2017 and is expected to extend into early 2019. Groundwater verification will be initiated upon completion of remedial excavations and is expected to be completed by late 2019. Due to the challenges associated with remediation excavation of the southeast area (e.g. influx of water from Lake Ontario to former harbour inlet), remedial excavation and subsequent groundwater verification in the southeast area of the Site will be coordinated with construction and excavation of deep foundations required for underground parking. Filing of multiple Records of Site Condition (RSC) will be completed following final soil management efforts during below-grade work associated with the future development (i.e. foundations, roads, utilities, soil re-use within grading and landforms etc.).

Attached as **Table 1** is a matrix that provides a summary of information that is associated with the remedial approach for the Site.

4.1 O.REG. 153/04 RISK ASSESSMENTS

Impact to soil and groundwater with various COC was identified at the Site during the Phase Two ESAs (Barenco, 2010), (Exp, 2015a) (Exp, 2015b), and (Stantec, 2018). The identified COC appear to be associated with historical activities at the Site associated with petroleum refining. Residual concentrations of COC in soil and groundwater at the completion of the targeted remedial excavation program, and following construction associated with the development will be managed through the completion of up to four O.Reg. 153/04 Tier 2 and Tier 3 Risk Assessments. The risk assessments will be initiated concurrently with the targeted remedial excavation program at the Site. Attached **Figure No. 5 (Appendix A)** identifies the parcels at the Site that are associated with each proposed risk assessment. The final number and boundaries of each Risk Assessment parcel may require revision as the remediation program progresses.

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Independent whether the Tier 2 or Tier 3 Risk Assessment approach is utilized, the completion of the Risk Assessments will include the following general tasks consistent with O.Reg. 153/04 – Schedule C:

- Site characterization data collected by Stantec and others during the Phase Two ESAs will be used to establish human and ecological conceptual site models (CSMs);
- Exposure estimates and risk characterization for identified current and future receptors without consideration of RMMs will be completed for relevant COCs and identified exposure pathways;
- Based on the risk evaluation and considering appropriate risk management approaches, PSSs will be recommended;
- As it is expected that risk management will be required, a RMP providing a management approach protective of identified receptors will be established; and
- Recommended RMM for the Site may include administrative requirements (Site Specific Health and Safety Plans, Soil Management Plan, etc.), property restrictions (e.g., no buildings with enclosed space) or engineered RMM (e.g., surface capping, vapour mitigation barriers) deemed reasonable and necessary to ensure that receptor exposure is managed to within the acceptable regulatory risk levels. Additional discussion of possible RMM to be implemented at the Site are summarized in **Section 4.2**.

4.1.1 O.Reg. 153/04 Tier 2 Risk Assessment

Where Site conditions allow, the intended risk assessment approach will be to complete an O.Reg. 153/04 Tier 2 Risk Assessment using the MOECC MGRA Model. Completion of a Tier 2 Risk Assessment is expected to result in a streamlined review with the MOECC. As discussed in **Section 4.2**, the Tier 2 MGRA model includes RMMs that are common elements in site development (e.g., ventilated parking (storage) garages, surface capping, etc.). No Financial Assurance (*Environmental Protection Act, R.S.O. 1990, Part XII, Sections 131 to 136 and 176*) will be necessary as the recommended RMMs will not be needed to mitigate potential off-site adverse effect, or require monitoring to confirm risk reduction performance.

The area of the Site where a Tier 2 Risk Assessment will be completed is located proximate to the west, north (Lakeshore Road West), and a portion of the east (Mississauga Road) property boundaries (identified as Parcel 1 on **Figure No. 5 (Appendix A)**). Historical activities that resulted in significant impact to soil and groundwater at the Site were generally located in central locations away from property boundaries. Consequently, concentrations of COC in locations where Tier 2 Risk Assessment is contemplated were generally of lower magnitude and/or were limited to overburden materials and did not extend into unweathered bedrock. It is also expected that final built-form in these areas of the Site will be constructed at elevations higher than the shallow groundwater table. Although derived PSS using the MOECC MGRA Tier 2 Model will likely result in more stringent remedial objectives, the required soil excavation to facilitate both the targeted remedial excavation as well as the future development (e.g., below grade parking, roadways, etc.) is believed to be sufficient to address observed soil and groundwater impacts in these areas and manage any identified unacceptable risk to human and/or ecological receptors using available Tier 2 RMM (**Section 4.2**).

The completion and submission of a Tier 2 Risk Assessment will use the MOECC 'Approved' Tier 2 MGRA Model, November 1, 2016 (MGRA Model) and the integrated report template. The submission of a Tier 2 Risk Assessment

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to the MOECC for internal review and approval is a regulated process under O. Reg. 153/04. The submission requires the review and evaluation of available site data for the risk assessment area, the completion of a standard screening for COC against applicable generic SCS, and the establishment of conceptual site models (CSMs) identifying the relevant Site receptors (ecological and human) and the associated exposure pathways for COC.

As identified in O. Reg. 153/04 the regulated review timeframe for a Tier 2 Risk Assessment submission is eight weeks. It is anticipated that a minimum of two rounds of review comments will be received from the MOECC for the submitted Tier 2 Risk Assessment. General information associated with approximate submission dates and expected review timelines have been included in **Section 4.6** and on **Table 1 (Appendix A)**.

4.1.2 O.Reg. 153/04 Tier 3 Risk Assessments

Three O.Reg. 153/04 Tier 3 Risk Assessments will be completed on the remaining areas of the Site. The areas of the Site associated with each Tier 3 Risk Assessment are shown on **Figure No. 5 (Appendix A)** and are summarized as follows:

- The central area of the Site where LPH and/or elevated contaminant concentrations are observed in bedrock groundwater (Parcel 2),
- The area near the south property boundary from approximately 35 m (limit of CVCA regulated area) and approximately 115 m of Lake Ontario (Parcel 3),
- The areas within 35 m of Lake Ontario (Parcel 4).

The completion of O.Reg. 153/04 Tier 3 Risk Assessments will allow the consideration additional site-specific characteristics, including supplemental evaluation of receptors and contaminant exposure pathways. While it is intended to utilize available Tier 2 RMM included in the Tier 2 MGRA model to wherever possible, the Tier 3 Risk Assessment approach in these areas of the Site can allow greater flexibility with respect to risk management by incorporating supplemental mitigative measures to existing planned infrastructure (e.g., vapour migration pathway elimination to supplement parking garage vapour intrusion mitigation). Each Tier 3 Risk Assessment will also include an evaluation of whether Financial Assurance is required to ensure funds are available to maintain monitoring programs associated with the mitigation of potential off-site adverse effect, or confirmation of risk reduction performance.

4.2 ANTICIPATED RISK MANAGEMENT MEASURES

A RMP will be developed as part of each risk assessment. The RMP will summarize required engineering or administrative controls necessary to reduce risks to human health or ecological receptors from remaining residual contaminants. The management of risk associated with any residual COC at the Site will be accomplished using RMM engineered controls that are common features in the development proposed for the Site. During development of the RMPs, liaison with the City of Mississauga will be completed to ensure that any recommended RMM do not conflict with intended use of future conveyance lands (i.e., roadways and parks). Once prepared, the RMPs will be utilized in consultation with the MOECC District Engineer to prepare CPUs for the associated Risk Assessment parcels (**Section 4.4**). As required by the MOECC, any installed RMM engineered control (e.g., surface caps) will be documented through completion of as-built drawings. In addition to submission to the MOECC, as-built drawings will also be provided to the City of Mississauga for review prior to conveyance of applicable lands.

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Anticipated RMM engineered controls for the Site are surface caps to manage receptor contact with COC in soil or groundwater, and ventilated parking garages to manage possible vapour intrusion of COC. The development plans for the Site do not include subsurface occupied space in any of the built-form. In addition to the requirement for surface caps, it is anticipated that any parkland blocks will likely include incorporation of engineered controls for slab-on-grade construction (e.g. vapour barrier) to address potential vapour intrusion concerns. In the waterfront parkland (referenced as Block S on **Figure No. 3, Appendix A**), it is anticipated that a prohibition for construction of enclosed buildings will apply.

At locations at the Site where residual impacts will be managed through the completion of a Tier 3 Risk Assessment (i.e., Parcels 2 to 4, **Figure No. 5 (Appendix A)**), supplemental engineered controls may be incorporated into the development design. For example, if additional vapour mitigation is required due to multi-level underground parking structures extending into the groundwater table, an impermeable membrane may be required along foundation walls/floors of parking garages in addition to standard ventilation requirements. It is also possible that maintenance of an erosion control feature (e.g., retaining wall) could be required along the shoreline to prevent exposure of contaminants to aquatic receptors in Lake Ontario.

Through consideration of the identified COC at the Site, the anticipated RMMs and associated exposure pathways that are likely to be addressed in the Risk Assessments are summarized in the table below. Additional details associated with the identified RMM are included in the subsequent sections. Alternate RMM specifications will be required for portions of the Site that will be conveyed to the City of Mississauga in the form of public roadways and parks. For this reason, description of RMMs associated with private and public lands have been discussed separately where applicable, and are subject to acceptance by the City of Mississauga.

Anticipated Risk Management Measure	Medium	Pathway Controlled
Hard Cap (Private Lands) (See Note a)	Soil	Direct Soil Contact
		Plants and Soil Organisms
Fill Cap (Private and Public Lands) (See Note b)	Soil	Direct Soil Contact
		Plants and Soil Organisms
Hard Cap/Fill Cap (Public Lands)	Soil	Direct Soil Contact
		Plants and Soil Organisms
Soil and Water Management Plan (SMP)	Soil and Groundwater	Direct Contact with Soil and Water (See Note c)
Site-Specific Health and Safety Plan	Soil and Groundwater	Direct Contact with Soil and Groundwater (See Note d)
Building Restriction or Vapour Mitigation Barrier	Vapour	Soil/groundwater to Indoor Air (on-site)

Notes:

- Hard cap in absence of underlying additional fill cap will only be utilized on Private Lands that will not be conveyed to the City of Mississauga
- The specification of the fill cap will be dependent upon whether the lands will remain Private or be conveyed to the City of Mississauga as Public Land
- Appropriate application of the SMP as indicated in the RMP is expected to reduce exposure to a sufficient degree to ensure that regulatory acceptable risk levels are met.

- d) Appropriate application of typical PPE for a subsurface worker in the HSP plan as indicated in the RMP is expected to reduce exposure to a sufficient degree that regulatory acceptable risk levels are met.

4.2.1 Surface Cap

To mitigate any identified risk associated with the identified COC impacted soils on the Site following soil verification, surface cover will be required at locations where an insufficient thickness of unimpacted material exists between the ground surface and remaining residual soil impacts. In these locations it will be recommended that the surface be capped using either a fill cap or a hard cap/fill cap, as described below. The intent of the surface cover will be to block exposure of human health and ecological receptors to soils with COC concentrations that may represent an unacceptable risk via direct contact. Should re-use or importation of soil be required to establish the surface cover RMM, it will be conducted consistent with O.Reg.153/04 Schedule E and the MOECC's *Management of Excess Soil – A Guide for Best Management Practices (updated June 2017)*, or future MOECC excess soil regulations after these come into effect.

4.2.1.1 Hard Cap

In areas of the Site where the development plan requires hard surfaces (e.g., buildings, roadways, sidewalks, etc.), a hard cap meeting the specifications below will be established. The final design of any concrete or asphalt pavement surface associated with a hard cap will be completed by a qualified geotechnical engineer. **Drawing No. 1 (Appendix B)** provides generic specifications associated with the proposed Hard Caps on Private and Public Lands.

Private Lands

In locations at the Site where soil is not covered by at least 1.0 metre of unimpacted material and which will not be conveyed to the City of Mississauga (**Figure No. 4 (Appendix A)**), a suitable hard cap will consist of asphalt, concrete, a building floor slab installed above Site soil. The specification for a hard cap on private lands will be consistent with that available in the MOECC MGRA model. That is, the Hard Cap will be *“at least 225 millimetres thick, and consist of at least 75 millimetres thickness of hot mix asphalt or poured concrete underlain by Granular “A” aggregate or equivalent material, and includes a building slab or building foundation and floor slab meeting these specifications”*.

Public Lands

At locations on the Site where a hard surface is necessary that will be conveyed to the City of Mississauga (e.g., within proposed roadways or walkways), and where soil is not covered by at least 1.0 m of unimpacted material, a hard cap underlaid with unimpacted material (defined as “Capping Soil” within the MOECC MGRA model, or other inert non-soil materials such as crushed concrete or aggregates) will be established to a minimum depth of 1.0 m below the final design elevation of the ground surface (or minimum thickness as determined through consultation with the City of Mississauga). Surface treatment of the hard cap (e.g., asphalt or concrete) will be consistent with that required on private lands (i.e., at least 225 millimetres thick), or consistent with any City of Mississauga construction specifications (which ever is greater). The transition to underlying soil which may have residual concentrations of COC meeting applicable PSS will be identified using appropriately spaced underground marker tape.

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Unimpacted soil included within the minimum 1.0 m depth that will be suitable for use beneath the asphalt or concrete surface will be of environmental quality consistent with the MOECC definition of "Capping Soil" included within the MGRA model. That is, Capping Soil is defined as:

- (a) soil found on, in or under the Property in which no Property Specific Contaminants of Concern are present, or*
- (b) soil that meets the applicable site condition standards for the Property, and does not contain any contaminant for which no applicable site condition standard for soil is prescribed under Part IX (Site Condition Standards and Risk Assessment) and which is associated with any potentially contaminating activity described in the Risk Assessment.*

The definition of *soil* is consistent with that included in O.Reg. 153/04.

The applicable O.Reg. 153/04 site condition standard associated with the determination of unimpacted soil will be Table 3 for a residential/parkland/institutional property use for medium/fine textured soil.

It is anticipated that sufficient excess soil will be generated during remedial and construction excavation activities that can be utilized as unimpacted soil as part of the surface cap. The environmental quality of segregated soil that would be utilized as unimpacted soil would be confirmed through analytical testing at a frequency consistent with O.Reg. 153/04 – Schedule E. A geotechnical engineer will also confirm the suitability of segregated soil as unimpacted engineered fill for use within any surface cap.

A minimum thickness of 1.0 m of unimpacted material is believed to be protective to any future subsurface worker that could be exposed to residual contaminants during near-surface activities following conveyance to the City of Mississauga (e.g., landscaping, road or sidewalk repair, etc.). As noted below, additional thickness of unimpacted materials will be incorporated in areas of utility services. It is also believed that 1.0 m of unimpacted materials will ensure that minimal impacted excess soil would be generated by the City during future near-surface activities in locations away from installed utility services that would require management or disposal. The 1.0 m thickness of unimpacted material is subject to acceptance by the City of Mississauga, recognizing the City's Guiding Principles memorandum notes a minimum thickness of 1.5 m of unimpacted material.

Copies of standard utility cross-sections for public land prepared by Urbantech Consulting are included as **Appendix C**. Proposed minimum thicknesses of unimpacted material is illustrated on the cross-sections. Information associated with proposed unimpacted material surrounding new or replaced services installed beneath the 1.0 m surface cap is included in the next section.

Unimpacted Fill Requirements – New or Replaced Services (Public Lands)

In locations on Public Lands where new or replaced subsurface utilities are required at an elevation below the Hard Cap specification for public lands summarized in the previous section, utilities will be placed within a trench backfilled with unimpacted bedding material meeting the unimpacted material specification. Typical new or replaced utilities that may be installed on public lands at elevations below the depth of the 1.0 m surface cap are expected to include storm and sanitary mains and associated manhole/catch basin structures, and utility vaults. Although final specifications of required unimpacted bedding material surrounding new or replaced utilities would be established

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during the completion of the Risk Assessment, generic specifications are included below that are consistent with standard construction practice:

- Where new or replaced utilities are required in the ground at a depth greater than 1.0 m, there must be:
 - unimpacted bedding material from surface cover (hard or fill cap) to the top of the installed utility or associated structure;
 - a minimum of 300 mm of unimpacted bedding material below the utility or associated structure, and.
 - a minimum of 300 mm of unimpacted bedding material on either side of the new or replaced utility or associated structure.

The generic specification for unimpacted bedding material surrounding new or replaced services installed deeper than 1.0 m are included on generic specifications shown on **Drawing No. 1 (Appendix B)**, and on the standard utility cross-sections (**Appendix C**).

4.2.1.2 Fill Cap

In areas where a Hard Cap will not be installed, a Fill Cap will be required. The thickness of the Fill Cap will be dependent upon whether the area of the Site will remain under private ownership, or will be conveyed to the City of Mississauga as public land (as identified on **Figure No. 4 (Appendix A)**).

Soil suitable for use within the fill cap (i.e., unimpacted soil) will be of environmental quality consistent with the MOECC definition of "Capping Soil" included within the MGRA model (as defined in **Section 4.2.1.1**). The applicable O.Reg. 153/04 site condition standard associated with the determination of unimpacted soil will be Table 3 for a residential/parkland/institutional property use for medium/fine textured soil.

As stated above, excess soil generated during remedial and construction excavation activities will be utilized as unimpacted soil as part of the surface cap once the environmental quality has been confirmed through analytical testing. A geotechnical engineer will also confirm the suitability of segregated soil as unimpacted engineered fill for use within any fill cap.

The development of the Site will also include the use of Low Impact Development (LID) features to aid in the management of stormwater. The LID features will cause the retention and infiltration of accumulated stormwater through permeable soils, and possible outflow to Lake Ontario. Soil beneath any installed LID will meet the Fill Cap specification applicable to location (i.e., public or private lands).

In the event that stormwater management features are required at the Site, the base of any containment will meet the required fill cap thickness. In the event the base of the stormwater management feature extends into the underlying groundwater table, the fill cap will include a low permeability barrier to prevent potential interaction between groundwater and surface water.

Drawing No. 2 (Appendix B) provides generic specifications associated with the proposed Fill Caps on Private and Public Lands.

Private Lands – 1.0 m Thick Fill Cap

In areas of Site that will remain privately owned and not require a Hard Cap, a minimum 1.0 m thick fill cap will be required to mitigate any identified risk associated with COC in soils where impacted soil is present at or within 1.0 m of design ground surface elevation. The specification for a Fill Cap on private lands will be consistent with that available in the MOECC MGRA model. That is, the Fill Cap will be at least 1.0 m thick and *“consist of at least 0.5 metres thickness of Capping Soil, and above this, cover consisting of additional Capping Soil or non-soil surface treatment such as asphalt, concrete or concrete pavers, stone pavers, brick or aggregate”*.

Public Lands – 1.0 m Thick Fill Cap

In areas of the Site that will be conveyed to the City of Mississauga as public land and not include a Hard Cap (e.g., roadway boulevards, parks, etc.) a minimum 1.0 m thick fill cap will be required to mitigate any identified risk associated with COC in soils where impacted soil is present at or within 1.0 m of developed ground surface elevation. The specification for a fill cap on public lands will be identical to that for Private Lands (see previous section). That is, the Fill Cap in Public Lands will be at least 1.0 m thick and *consist of at least 0.5 metres thickness of Capping Soil, and above this, cover consisting of additional Capping Soil or non-soil surface treatment such as asphalt, concrete or concrete pavers, stone pavers, brick or aggregate*. The transition to underlying soil which may have residual concentrations of COC will be identified using appropriately spaced underground marker tape, except in areas where sufficient fill cap is already existing and vegetation is present at surface.

Similar to the discussion above associated with the hard cap specification for public lands, a minimum thickness of 1.0 m is believed to be protective of any future (i.e., following conveyance to the City of Mississauga) subsurface worker that could be exposed to residual contaminants during near-surface activities (e.g., landscaping). It is also believed that the 1.0 m cap thickness would ensure minimal impacted excess soil would be generated by near-surface activities that would require management or disposal.

The generic specification for the 1.0 m thick fill cap in public lands are included on generic specifications shown on **Drawing No. 2 (Appendix B)**, and on the standard utility cross-sections (**Appendix C**).

4.2.2 Vapour Intrusion Mitigation

Mitigation of exposure to COC in soil and/or groundwater via vapour intrusion is expected to be required at the Site. Therefore, the RMP for the Site is expected to include recommendations for engineered controls or property restrictions to address potential vapour intrusion concerns.

4.2.2.1 Storage (Parking) Garage

The proposed built-form at the Site will incorporate a minimum of one level of underground parking beneath the footprint of each building. As the 2012 Ontario Building Code (OBC) mandates a ventilation specification for parking garages (referred to as Storage Garages in the OBC), the underground parking will act as an RMM to reduce exposure for human receptors to soil and groundwater vapour in indoor air.

Consistent with the requirements for the Storage Garage RMM as specified by the MOECC within the Tier 2 MGRA model, the parking garages at the Site will be constructed at or below the final grade elevation associated with each building and will cover the entire area of the building footprint. Ventilation within the parking levels will also comply the

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OBC including specific provisions for the design of a mechanical ventilation system (Division B, subsection 6.2.2.3), the interconnection of air duct systems (Division B subsection 6.2.3.9(2)) and air leakage (Division B, Section 5.4).

Supplemental Vapour Intrusion Measures

Specific development blocks of the Site will require more than one level of underground parking to accommodate parking requirements. These areas of the Site are exclusively located in Risk Assessment parcels where residual concentrations of COC will be managed through the completion of O.Reg. 153/04 Tier 3 Risk Assessments. Permanent foundation drainage features are likely to be required in these areas as below grade parking structures requiring more than one level may extend into the groundwater table. Perimeter and underfloor drains will not be considered to avoid possible treatment requirements of collected groundwater prior to discharge to municipal systems. For this reason, it is anticipated that building foundations requiring permanent drainage will be waterproofed. The waterproofing of building foundations is also expected to sufficiently mitigate potential intrusion of COC vapours into the parking structures (in addition to the OBC storage garage ventilation requirements summarized above). The design and specification of any selected waterproofing product will consider residual COC concentrations to ensure sufficiently chemical resistivity to ensure performance requirements are met (i.e., continued risk reduction as well as waterproofing).

4.2.2.2 Building Restrictions or Vapour Intrusion Mitigation Barrier

In areas of the Site where no buildings with storage (parking) garages will be constructed (e.g., parkland), a prohibition of enclosed buildings will be recommended unless engineered controls are included to address vapour intrusion concerns. These measures will be required to mitigate potential exposure of human receptors to soil and groundwater vapours that may be present in the subsurface. Typical engineered controls incorporated into building design are vapour mitigation barriers that are installed to separate building surfaces from site soil.

4.2.2.3 New or Replaced Utilities

Vapour migration and/or intrusion concerns may exist with the installation of new or replaced buried utilities at the Site. Although potential human health receptors and associated exposure pathways will be evaluated through the completion of the Risk Assessment (including consideration of subsurface workers that may come in contact impacted soil or groundwater), standard construction practices or specifications can typically reduce/block preferential vapour migration in utilities and utility trenches. Examples of typical features associated with the installation of utilities include:

- The installation of trench plugs constructed of low permeability material (e.g., clay, bentonite-amended unshrinkable fill) in utility trenches to mitigate against trench bedding providing preferential pathways for vapour migration toward buildings or off-site; and
- The use of gasketed pipe connections for all open void utilities (e.g., storm sewer, sanitary sewer) on the property to mitigate against vapour migration into and through the utility pipes.

4.2.3 Soil and Water Management Plan

The management of soil and groundwater at the Site will be required during remediation and redevelopment activities. A Soil Management Plan (SMP) and Water Management Plan (WMP) has been prepared to support

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earthworks that will be completed at the Property from 2017 to 2019 as a component of re-development (Stantec, 2017c). It is expected that the SMP and WMP will be updated regularly prior to implementation of various phases of site development. The focus of the current SMP and WMP is on the appropriate on-site management of soil and water during remediation, construction and maintenance activities, and disposal of excess soil and water generated during earthwork activities. Soil and water management activities will occur during remediation and construction at the Site, and may include excavation of foundations, regrading, excavation for service installations or shoring, building construction, road construction, the removal of excess soil and water from the Property and/or the importation of clean soil and/or aggregate.

The SMP and WMP include direction on the management of the following elements associated with the remediation and re-development of the Site:

- Direction on the management of excavated impacted soil that exceeds applicable O.Reg. 153/04 SCS and associated PSS. This includes requirements for analytical testing, evaluation for potential re-use at off-site locations, and water characterization for off-site disposal at MOECC licenced waste receivers
- Management of excess soil suitable for re-use at the Site and/or off-site including analytical testing requirements, requirements for use at off-site properties.
- Tracking requirements for all excavated soil that is either disposed off-site, or re-used at the Site or identified off-site property.
- Dust control measures and stockpile management procedures implemented during remediation and earthwork activities
- Water collection, treatment, and discharge of any excess water (surface water from precipitation events, or groundwater) encountered during remediation or earthworks activities.

Once remediation and Site development is completed, future soil and water management associated with regular operation and maintenance tasks may be required. It is anticipated that the SMP and WMP will be revised to incorporate other recommendations associated with the RMP of the completed Risk Assessments.

4.2.3.1 Worker Health and Safety Requirements

In the event of post-development excavation beneath the surface cover RMM, a Site-Specific Health and Safety Plan (SSHSP) will be required in accordance with applicable Ontario Ministry of Labour health and safety regulations. The SSHSP will consider the potential human health risks identified in the risk assessment report to protect construction and maintenance workers from potential exposure to impacted soil and groundwater beneath the surface cover RMM at the Site. This may entail workers wearing long sleeves, long pants, boots, gloves, and dust masks when working in excavations. The completed Risk Assessments may also include recommendations on supplemental personal protective equipment following evaluation of maintenance and construction workers and associated exposure pathways. Recommended Worker Health and Safety Requirements associated with the RMP may be in addition to any other requirements under the Occupational Health and Safety Act and its Regulations, including, but not limited to, excavation safety.

4.2.4 Requirements for Monitoring and Maintenance

Regular monitoring, inspection and maintenance of recommended RMM engineered controls will be required to ensure the necessary exposure reduction to residual COC is maintained following Site development.

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4.2.4.1 Groundwater Monitoring and Sampling

Completion of the targeted remedial excavation program is expected to remove any COC that could continue to act a continuing source(s) for on-going groundwater impact. Once the groundwater verification program associated with the targeted remedial excavation program is complete, it is expected that groundwater conditions would continue to improve over time. However, short-term groundwater monitoring and sampling may be required along downgradient property boundaries (or boundaries of individual Risk Assessment parcels) to demonstrate that groundwater migrating beyond Site or Risk Assessment boundaries does not include dissolved-phase concentrations of COC that would exceed applicable PSS or generic SCS on the adjacent parcel or property. The requirement for any short-term groundwater monitoring and sampling would likely be limited to Tier 3 Risk Assessment parcels. Any monitoring wells required as part of a short-term groundwater monitoring and sampling program would be installed on private property. It is anticipated that if required, groundwater monitoring and sampling would be necessary for a period of approximately three years.

4.2.4.2 Surface Cover

Isolation of identified receptors from identified COC associated with Site soil will be achieved following redevelopment through the maintenance of the fill cap and/or hard cap/fill cap (asphalt or concrete). Periodic monitoring of the surface cover at the Site will be required to assess and confirm the condition remains consistent with the specification outlined in **Section 4.2.1**.

For both the fill cap and the hard cap/fill cap options, the MOECC MGRA model has provided the following guidance with respect to required inspection and maintenance of the integrity of the cap:

- A minimum of semi-annual inspections (spring and fall) of the capping
- Noting any deficiencies in the capping at the time of inspection or at any other time
- Repair of any deficiencies in the capping
- Maintenance of a log of inspections, findings and repairs made to the capping

4.2.4.3 Storage (Parking) Garage

The Storage (Parking) Garage generic RMM engineered control will be incorporated into buildings using required design characteristics required through the OBC. The only maintenance that will be required on this generic RMM is associated with ensuring the ventilation system operates to the performance specifications required by the OBC. No monitoring or inspections associated with the storage garage is required during the life of the building(s).

Should supplemental vapour intrusion measures be required in areas of the Site where more than one level of underground parking is necessary, the Tier 3 Risk Assessment may recommend a one-time indoor air sampling event within the parking garage prior to building occupancy to confirm appropriate risk reduction is being achieved. The requirement and associated comparative indoor air standard for the parking garage will be evaluated as part of the Tier 3 Risk Assessment and associated RMP.

4.3 REMEDIAL EXCAVATION PROGRAM

The characterization of soil and groundwater at the Site has identified various locations where select COC (primarily associated with petroleum hydrocarbons) are present at concentrations that represent a potential source for

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continued impact to soil and/or groundwater. The general locations of these areas are identified on **Figure No. 6 (Appendix A)**. It is considered likely that if remedial measures are not implemented to reduce concentrations in soil and groundwater at these locations, the potential for future migration of contaminants both from the Site and to on-site human health and ecological receptors would remain a continuing concern. Therefore, targeted remedial excavation and off-site disposal of soils identified as representing a continuing contaminant source to soil and groundwater was initiated in late-2017 and will be completed for the majority of the Site in early 2019. Targeted remedial excavation in the southeast area of the Site will be initiated in conjunction with construction and excavation of deep foundations required for underground parking.

Remedial objectives have been established using preliminary PSSs derived using the MOECC MGRA model to facilitate the completion of the targeted remedial excavation program in advance of Risk Assessment submission. The preliminary PSSs that will be used as remedial objectives are summarized in **Table 1 (Appendix A)** and were derived using information obtained during the Phase Two ESA following consideration of the anticipated RMM discussed in **Section 4.2**. A re-evaluation of site-specific physical characteristics and confirmation of the proposed RMMs will be completed during the preparation of the Risk Assessment for MOECC submission.

Most soil at the Site requiring excavation and off-site disposal is located within 3 m BGS. However, excavation to depths exceeding 6 m BGS is expected at specific locations at the Site (e.g., the existing Shale Pit, the backfilled portion of the Shale Pit, and the former harbour inlet). Excavation of impacted sediment within the Shale Pit will also be necessary. Within areas of the Site where excavation is expected to extend deeper than 3 m BGS, pre-excavation dewatering will be required to establish conditions suitable for conventional excavation techniques. Recovered groundwater will be treated prior to discharge.

The targeted remedial excavation of source soil is expected to require off-site export of approximately 300,000 to 330,000 m³ of impacted soil. As excavation associated with construction will not be initiated prior to the completion of the targeted remedial excavation, each excavation may require temporary backfill to an elevation above the groundwater table. Since the soil balance for the development of the Site (i.e., including soil generated by remediation and construction) includes a likely surplus, importation of soil to the Site to backfill the targeted remedial excavations is not likely to be required.

Except for the southeast area of the Site, it is expected that impacted soil representing a continued source of contamination to soil and groundwater at the Site will have been removed prior to the initiation of any construction activities. With the expectation that groundwater verification will also have been completed, only localized residual soil impacts exceeding derived PSS are expected to remain at the initiation of construction activities. These residual soil impacts will be excavated and exported for off-site disposal concurrent with excavation activities associated with construction. The volume of impacted soil will be exported from the Site during this period is expected to be minimal. Following a soil verification program during these construction activities, it is anticipated that all soil and groundwater within the applicable Risk Assessment/Record of Site Condition Parcels (**Figure No. 5 (Appendix A)**) will meet the derived PSS.

4.3.1 Soil Management/Excavation of Impacted Soils

Site development will require an earthworks program where soil and bedrock will be excavated, segregated, and either exported from the Site or re-used as engineered fill. The remediation and construction activities associated with the movement of soil at the Site will be completed in accordance with the developed SMP and WMP (Stantec,

REMEDIAL ACTION PLAN, 70 MISSISSAUGA ROAD SOUTH, MISSISSAUGA, ONTARIO

Remedial Approach

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2017c). The SMP/WMP has been prepared consistent with MOECC guidance. The SMP/WMP outlines earthworks requirements associated with dust control, characterization of excess soil to be used below and as part of a RMM cap, and record keeping. The management and control of excavated soil that will be exported from the Site, either impacted soil or identified as excess, will be completed under strict chain of custody in a manner consistent with expectations of the MOECC. The final destination for all exported soil will be known and documented prior to being transported from the Site.

4.3.2 Verification Program

Soil verification samples will be recovered for laboratory analysis from the final walls and bases (if within overburden) of the completed excavation(s) once it is determined that sufficient impacted soil has been excavated. The excavations will not be backfilled until a time that laboratory analysis has confirmed that the final walls and base of the excavation achieve the remedial objective for the property.

Following completion of the targeted remedial excavation program each location of the Site, a groundwater verification program will be initiated. O.Reg. 153/04 requires that groundwater verification associated with an ex-situ remediation approach (such as remedial excavation with off-site disposal) be confirmed over a period of two consecutive quarters. Therefore, in each area of targeted remediation an appropriate monitoring well network will be established to implement the groundwater verification program. It is intended that groundwater verification will be completed prior to the initiation of any construction activities associated with the development.

4.3.3 Temporary Dewatering (Remediation/Construction)

During the targeted remedial excavation and construction earthworks activities, surface water and/or groundwater will be encountered. Any liquid collected from dewatering activities to facilitate the remedial excavation program will be treated in accordance with an MOECC Environmental Compliance Approval (ECA) 1602-9WUQGD. Two water treatment systems will operate at the Site with a combined flow-through rate of 1,134 L/min. Each treatment system will include a sedimentation tank, bag filters, oil water separator, organo-clay and activated carbon vessels. Discharge of treated water will be to a private outfall to the natural environment (Lake Ontario). As it is anticipated that volumes of groundwater exceeding 50,000 L/day will be collected to facilitate excavation; particularly in the vicinity of the former Shale Pit, a MOECC Permit to Take Water (0564-ASJQ3E) has been issued to the Site. The PTTW permits a maximum daily water taking of 8,131,000 L.

In areas of the Site where remedial excavation is not expected to extend below 3 m of the existing ground surface, minimal groundwater will be encountered. Water accumulation within shallow excavations is likely to be associated with precipitation events. Water control in these areas of the Site will be managed on an as-required basis. During these periods (e.g., control of perched water, or accumulation of precipitation), the base of the excavation will be sloped to ditches and sumps. Any installed sump will consist of perforated vertical pipes with the surrounding annular space filled with aggregate (clear stone). Bottom suction submersible pumps will be utilized to collect any accumulated groundwater and direct it to the water treatment system.

Where remedial excavations extend to depths ranging from 3 m and 6 m below the existing ground surface, a vacuum wellpoint system will be installed. Wellpoints will be installed at 2 m centers from surface to contact with the unweathered shale. 32mm diameter wellpoints will be installed with the annular space filled with a select filter sand.

REMEDIAL ACTION PLAN, 70 MISSISSAUGA ROAD SOUTH, MISSISSAUGA, ONTARIO

Remedial Approach

March 1, 2018

Each wellpoint will be connected to a 150mm header manifold which will lead to an electrically operated wellpoint pump. Recovered groundwater from the each wellpoint will be directed to the water treatment system.

Where remedial excavations extend to depths greater than 6 m below the existing ground surface, an eductor well system will be utilized. 50 mm diameter eductor wells will be installed at 5 m centers to the unweathered shale contact. Each educator well will be connected to a dual pipe manifold system which will lead to an electrically operated eductor pumping system. Recovered groundwater water from the system will be directed to the water treatment system.

It is also expected that future construction activities will require temporary dewatering during excavation in areas where more than one level of underground parking will be necessary. During these activities it is anticipated that groundwater conditions at the Site will meet applicable derived PSS. However, it is anticipated that some level of treatment will be required prior to discharge to either the natural environment private outfall (e.g., Lake Ontario), or the City of Mississauga storm sewer systems.

4.3.4 Backfilling Activities

Once soil verification has been completed, remedial excavations will be partially backfilled by utilizing segregated soil from the targeted remedial excavation program. Following confirmation that segregated soil meets applicable remedial objectives for the Site, backfilling into 300 mm lifts will be completed to an elevation that has considered both future building foundation design as well the anticipated groundwater table. All backfilled material will be confirmed by a geotechnical engineer to have been compacted to 99% Standard Proctor Maximum Dry Density (SPMDD).

The amendment of backfill soil with a chemical oxidant may be considered in specific areas of the Site as a best-practices measure. If used, an oxidant would be applied to soil (either between lifts or pre-mixed) at elevations that are anticipated to be beneath the final static groundwater table and would be applied under an appropriate MOECC ECA.

4.4 CERTIFICATE OF PROPERTY USE & RECORD OF SITE CONDITION

Following Risk Assessment approval, liaison with the MOECC District Engineer will occur during the preparation of the individual CPUs for the areas of the Site associated with each of the risk assessment parcels. Each CPU will summarize required risk management measures and engineered controls for each risk assessment parcel and will outline any required monitoring, maintenance, submissions, and financial assurance (Tier 3 Risk Assessment parcels only) that are required as part of the RMP. The CPUs will also outline conditions associated with elements of worker health and safety specific to residual contaminants, as well as any soil management requirements. Copies of draft CPUs will be provided to the City of Mississauga for review and comment on elements that are associated with portions of the Site/Risk Assessment parcel that will be conveyed to the City of Mississauga (i.e., public roadways and parks).

It is expected that final CPUs will be issued in advance of any activity at the Site associated with construction. Preparation and submission of RSCs for the respective Risk Assessment parcels at the Site will occur once final soil verification has been completed during below grade construction.

Remedial Approach
March 1, 2018

4.5 ANTICIPATED EFFECTIVENESS OF RISK MANAGEMENT MEASURES

The purpose of the anticipated RMMs identified in **Section 4.2** is to control or modify COC exposure pathways to applicable human health and ecological receptors such that exposure is reduced to an acceptable level. The anticipated RMM engineered controls at the Site are generally consistent with available generic RMMs included in the MOECC MGRA Tier 2 model. Considering the objectives of the targeted remedial excavation program and associated soil and groundwater verification, the anticipated RMMs are believed to be sufficient to achieve the required amount of risk reduction to support all intended property uses at the Site, and would be feasibly implemented in the development. Final confirmation of suitable RMM and an evaluation of required risk reduction will be completed during the preparation of the noted Risk Assessments and will consider the post-remedial soil and groundwater conditions.

Anticipated requirements for long term monitoring and financial assurance requirements are discussed in **Section 4.2.4** and **Section 4.1**.

4.6 SCHEDULE

The attached **Table 1 (Appendix A)** includes a summary of key milestones associated with the implementation of the RAP at the Site. However, general milestones are summarized below:

Initiation of Targeted Remedial Excavation Program -	2017 Q4
Initiation of O.Reg. 153/04 Risk Assessments -	2018 Q1 (Parcel 1) to 2018 Q3 (Parcel 3)
Groundwater Verification Complete -	2019 Q2 to 2019 Q4
Risk Assessment Approval -	2019 Q4 to 2020 Q3
Acknowledged Records of Site Condition -	2 to 4 quarters from date of foundation permits

These provided dates should be considered approximate as a number of factors can influence the actual project timeline (e.g., site conditions, MOECC review, planning-related approvals etc.).

Closure
March 1, 2018

5.0 CLOSURE

This report documents work that was performed in accordance with generally accepted professional standards at the time and location in which the services were provided. No other representations, warranties or guarantees are made concerning the accuracy or completeness of the data or conclusions contained within this report, including no assurance that this work has uncovered all potential liabilities associated with the identified property.

This report provides an evaluation of selected environmental conditions associated with the identified portion of the property that was assessed at the time the work was conducted and is based on information obtained by and/or provided to Stantec at that time. There are no assurances regarding the accuracy and completeness of this information. All information received from the client or third parties in the preparation of this report has been assumed by Stantec to be correct. Stantec assumes no responsibility for any deficiency or inaccuracy in information received from others.

The opinions in this report can only be relied upon as they relate to the condition of the portion of the identified property that was assessed at the time the work was conducted. Activities at the property subsequent to Stantec's assessment may have significantly altered the property's condition. Stantec cannot comment on other areas of the property that were not assessed.

Conclusions made within this report consist of Stantec's professional opinion as of the time of the writing of this report, and are based solely on the scope of work described in the report, the limited data available and the results of the work. They are not a certification of the property's environmental condition. This report should not be construed as legal advice.

This report has been prepared for the exclusive use of the client identified herein and any use by any third party is prohibited. Stantec assumes no responsibility for losses, damages, liabilities or claims, howsoever arising, from third party use of this report.

The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the testing and/or sampling locations, and conditions may vary among sampling locations. Factors such as areas of potential concern identified in previous studies, site conditions (e.g., utilities) and cost may have constrained the sampling locations used in this assessment. In addition, analysis has been carried out for only a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec does not warrant against undiscovered environmental liabilities nor that the sampling results are indicative of the condition of the entire site. As the purpose of this report is to identify site conditions which may pose an environmental risk; the identification of non-environmental risks to structures or people on the site is beyond the scope of this assessment.

Should additional information become available which differs significantly from our understanding of conditions presented in this report, Stantec specifically disclaims any responsibility to update the conclusions in this report.

REMEDIAL ACTION PLAN, 70 MISSISSAUGA ROAD SOUTH, MISSISSAUGA, ONTARIO

Closure

March 1, 2018

References

March 1, 2018

6.0 REFERENCES

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Stantec. (2017a). Environmental Due Diligence Program, Port Credit Imperial Oil Lands, 70 Mississauga Road South, Mississauga, Ontario, prepared by Stantec for Port Credit Village Partners Inc., dated March 2, 2017.

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Stantec. (2018). Summary of Phase Two Environmental Site Assessment and Conceptual Site Model, 70 Mississauga Road South, Mississauga, Ontario, dated March 9, 2018

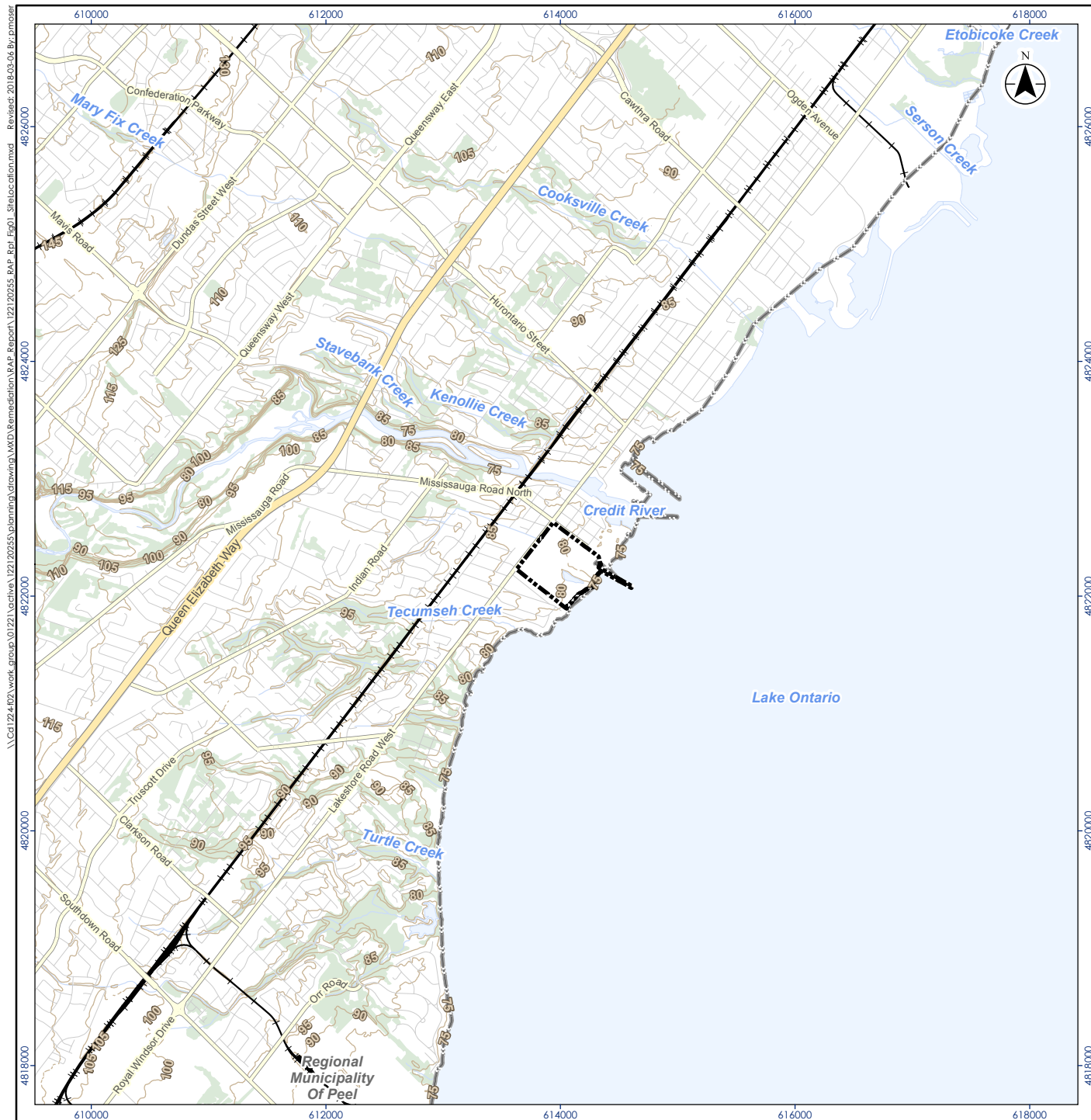
Appendix A **FIGURES AND TABLES**

Table 1 - Remediation Approach Summary, 70 Mississauga Road, Mississauga, Ontario¹

	Risk Assessment – Parcel 1 ¹ (West, North & East Property Boundaries)			Risk Assessment - Parcel 2 ¹ (Central Area of Site)			Risk Assessment – Parcel 3 ¹ (South Boundary)			Risk Assessment – Parcel 4 ¹ (Shoreline)		
Risk Assessment Strategy	Tier 2 Risk Assessment			Tier 3 Risk Assessment			Tier 3 Risk Assessment			Tier 3 Risk Assessment		
Proposed Property Uses	Residential Mixed Use Commercial Parkland			Residential Mixed Use Parkland			Residential Mixed Use Parkland			Parkland		
Initiation of Targeted Remedial Excavation of Source Material	2018 Q1			2018 Q2			2017 Q3 2018 Q4			Not Required		
Estimated Volume of Excavated Source Material for Off-site Disposal	95,000 to 105,000 m³			110,000 to 120,000 m³			95,000 to 105,000 m³			Not Required		
Initiation of O. Reg. 153/04 Risk Assessment	2018 Q1			2018 Q2			2018 Q2			2018 Q3		
Groundwater Verification Complete	2019 Q2 – 2019 Q4			2019 Q4			2019 Q4			Not Required		
Anticipated Risk Assessment Approval	2019 Q4			2020 Q2			2020 Q2			2020 Q3		
Number of Records of Site Condition	One			One			One			One		
Acknowledged Record of Site Condition	2 to 4 Quarters from Date of Foundation Permits			2 to 4 Quarters from Date of Foundation Permits			2 to 4 Quarters from Date of Foundation Permits			TBD		
Remedial Objectives/ Preliminary Property Specific Standards MOECC MGRA Model (Nov. 2016) (Petroleum Hydrocarbon Parameters)		<u>Soil</u> (µg/g)	<u>Groundwater</u> (µg/L) ²		<u>Soil</u> (µg/g)	<u>Groundwater</u> (µg/L) ²		<u>Soil</u> (µg/g)	<u>Groundwater</u> (µg/L) ²		<u>Soil</u> (µg/g)	<u>Groundwater</u> (µg/L)
	Benzene	17	35/2100	Benzene	17	35/2100	Benzene	11	35/2100	Benzene	11	270
	Toluene	140	45,000/45,000	Toluene	140	45,000/45,000	Toluene	53	18,000/18,000	Toluene	53	14,000
	Ethylbenzene	33	5800/5800	Ethylbenzene	33	5800/5800	Ethylbenzene	13	2300/2300	Ethylbenzene	13	1800
	Xylenes	52	5200/11,000	Xylenes	52	5200/11,000	Xylenes	20	4200/4200	Xylenes	20	3300
	PHC F1	450	670/7300	PHC F1	450	670/7300	PHC F1	240	670/3900	PHC F1	240	420
	PHC F2	1500	1100/2500	PHC F2	1500	1100/2500	PHC F2	810	1100/2500	PHC F2	810	170
	PHC F3	7200	500/500	PHC F3	7200	500/500	PHC F3	7200	500/500	PHC F3	7200	500
	PHC F4	8000	500/500	PHC F4	8000	500/500	PHC F4	8000	500/500	PHC F4	8000	500
Anticipated Risk Management Measures (RMMS)	<ul style="list-style-type: none">- Ventilated Parking Garage or vapour barrier- No below grade occupied space- Surface cap (Hard and/or soil)- Worker health and safety plan – site and contaminant specific- Development of Soil Management Plan			<ul style="list-style-type: none">- Ventilated Parking Garage or vapour barrier- Possible Supplemental Vapour Mitigation (e.g. vapour-proofing foundations where >1 level of u/g parking)- No below grade occupied space- Surface cap (Hard and/or soil)- Worker health and safety plan – site and contaminant specific- Development of Soil Management Plan			<ul style="list-style-type: none">- Ventilated Parking Garage or vapour barrier- Possible Supplemental Vapour Mitigation (e.g. vapour-proofing foundations where >1 level of u/g parking)- No below grade occupied space- Surface cap (Hard and/or soil)- Worker health and safety plan – site and contaminant specific- Development of Soil Management Plan			<ul style="list-style-type: none">- Prohibition of Enclosed Buildings- Surface cap (Hard and/or soil)- Maintenance of erosion control feature (e.g., retaining wall) along shoreline- Worker health and safety plan – site and contaminant specific- Development of Soil Management Plan		
On-going CPU requirements (monitoring and maintenance)	<ul style="list-style-type: none">- Maintenance/inspection of caps			<ul style="list-style-type: none">- Maintenance/inspection of caps- Pre-occupancy indoor air testing (parking garage)- Possible groundwater monitoring			<ul style="list-style-type: none">- Maintenance/inspection of caps- Pre-occupancy indoor air testing (parking garage)- Possible groundwater monitoring			<ul style="list-style-type: none">- Maintenance of erosion control feature (e.g., retaining wall) along shoreline		
Financial Assurance	<ul style="list-style-type: none">- MGRA RMMs - Financial Assurance not anticipated			<ul style="list-style-type: none">- Possibly indoor air and groundwater monitoring			<ul style="list-style-type: none">- Possibly indoor air and groundwater monitoring			<ul style="list-style-type: none">- Not anticipated		

¹ Refer to associated Figures - **Figure No. 5** – Risk Assessment Parcels, **Figure No. 6** – Remediation Areas

² Preliminary Groundwater Property Specific Standards. Two standards are shown. Left value = condition where the building foundation is within the groundwater table. Right value = condition where the building foundation is above groundwater



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
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- Site Boundary
- Expressway / Highway
- Major Road
- Minor Road
- Railway - Operational
- Ground Topographic Contour (m AMSL)
- Watercourse
- Waterbody
- Wooded Area
- Municipal Boundary - Lower Tier
- Municipal Boundary - Upper Tier

0 500 1,000 metres
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Project Location 122120255
 Mississauga, Ontario Prepared by KJ on 3/6/2018
 Technical Review by CC on 2018-03-06

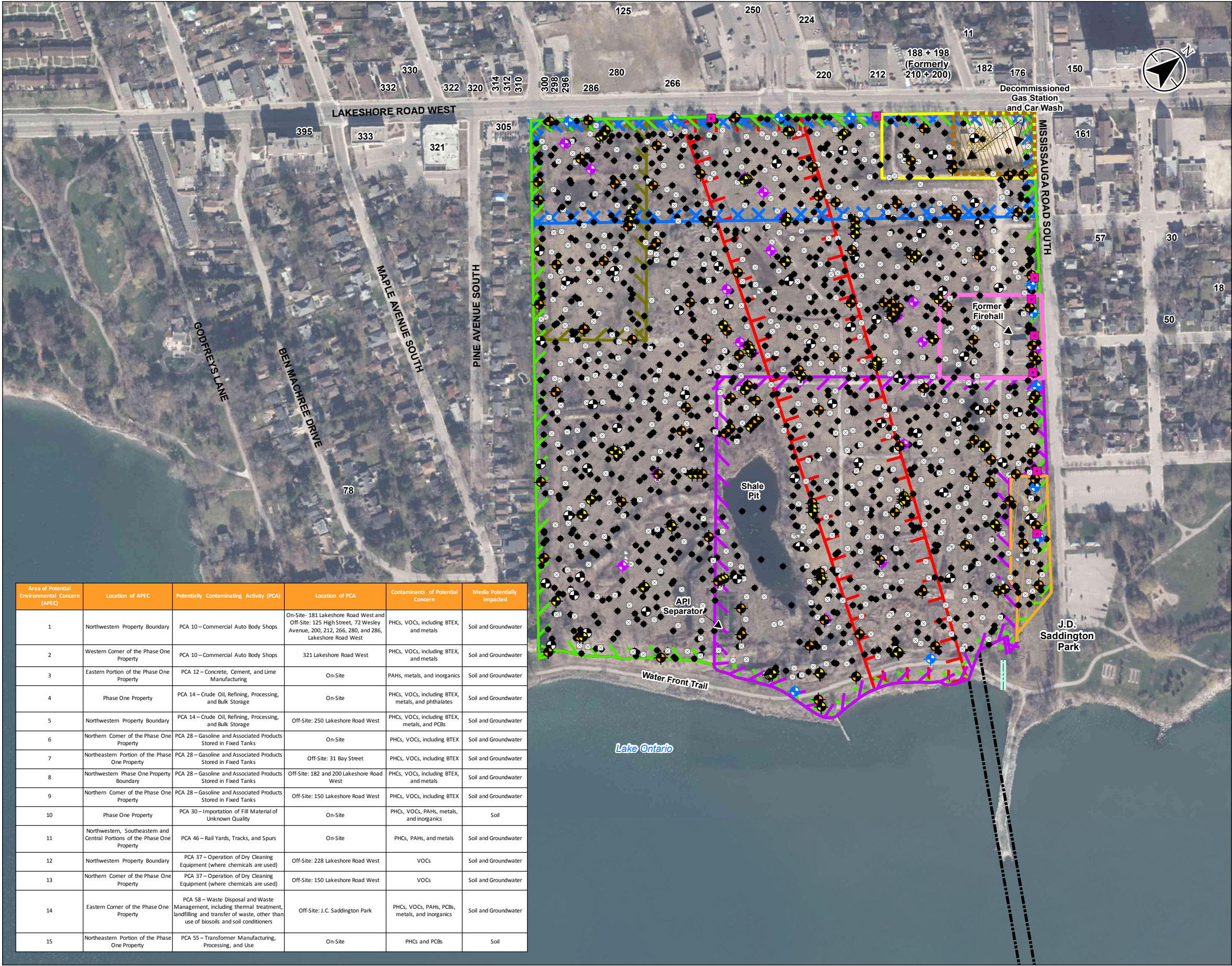
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 Port Credit West Village Partners Inc.
 70 Mississauga Road South, Mississauga, ON
 Remedial Action Plan

Figure No.
 1

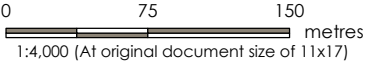
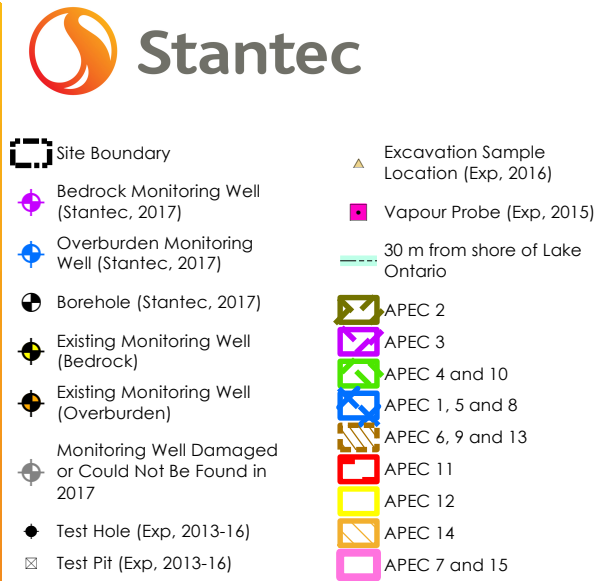
Site Location

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Area of Potential Environmental Concern (APEC)	Location of APEC	Potentially Contaminating Activity (PCA)	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted
1	Northwestern Property Boundary	PCA 10 – Commercial Auto Body Shops	On-Site: 181 Lakeshore Road West and Off-Site: 125 High Street, 72 Wesley Avenue, 200, 212, 266, 280, and 286, Lakeshore Road West	PHCs, VOCs, including BTEX, and metals	Soil and Groundwater
2	Western Corner of the Phase One Property	PCA 10 – Commercial Auto Body Shops	321 Lakeshore Road West	PHCs, VOCs, including BTEX, and metals	Soil and Groundwater
3	Eastern Portion of the Phase One Property	PCA 12 – Concrete, Cement, and Lime Manufacturing	On-Site	PAHs, metals, and inorganics	Soil and Groundwater
4	Phase One Property	PCA 14 – Crude Oil, Refining, Processing, and Bulk Storage	On-Site	PHCs, VOCs, including BTEX, metals, and phthalates	Soil and Groundwater
5	Northwestern Property Boundary	PCA 14 – Crude Oil, Refining, Processing, and Bulk Storage	Off-Site: 250 Lakeshore Road West	PHCs, VOCs, including BTEX, metals, and PCBs	Soil and Groundwater
6	Northern Corner of the Phase One Property	PCA 28 – Gasoline and Associated Products Stored in Fixed Tanks	On-Site	PHCs, VOCs, including BTEX	Soil and Groundwater
7	Northeastern Portion of the Phase One Property	PCA 28 – Gasoline and Associated Products Stored in Fixed Tanks	Off-Site: 31 Bay Street	PHCs, VOCs, including BTEX	Soil and Groundwater
8	Northwestern Phase One Property Boundary	PCA 28 – Gasoline and Associated Products Stored in Fixed Tanks	Off-Site: 182 and 200 Lakeshore Road West	PHCs, VOCs, including BTEX, and metals	Soil and Groundwater
9	Northern Corner of the Phase One Property	PCA 28 – Gasoline and Associated Products Stored in Fixed Tanks	Off-Site: 150 Lakeshore Road West	PHCs, VOCs, including BTEX	Soil and Groundwater
10	Phase One Property	PCA 30 – Importation of Fill Material of Unknown Quality	On-Site	PHCs, VOCs, PAHs, metals, and inorganics	Soil
11	Northwestern, Southeastern and Central Portions of the Phase One Property	PCA 46 – Rail Yards, Tracks, and Spurs	On-Site	PHCs, PAHs, and metals	Soil and Groundwater
12	Northwestern Property Boundary	PCA 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	Off-Site: 228 Lakeshore Road West	VOCs	Soil and Groundwater
13	Northern Corner of the Phase One Property	PCA 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	Off-Site: 150 Lakeshore Road West	VOCs	Soil and Groundwater
14	Eastern Corner of the Phase One Property	PCA 58 – Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosolids and soil conditioners	Off-Site: J.C. Saddington Park	PHCs, VOCs, PAHs, PCBs, metals, and inorganics	Soil and Groundwater
15	Northeastern Portion of the Phase One Property	PCA 55 – Transformer Manufacturing, Processing, and Use	On-Site	PHCs and PCBs	Soil



- Notes
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3. Orthomagery © First Base Solutions, 2017. Imagery taken in 2016.

4. Based on survey plan by J.D. Barnes Ltd. dated March 10, 2017.

5. APEC - Area of potential environmental concern



Project Location

Mississauga, Ontario

122120255

Prepared by KJ on 2018-03-08

Technical Review by CC on 2018-03-08

Client/Project

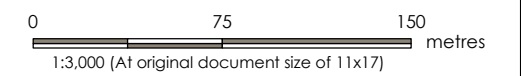
Port Credit West Village Partners Inc.
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Remedial Action Plan

Figure No.

2

Title

Site Plan with Areas of Potential Environmental Concern



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3. Based on Development Plan provided by Giannone Petricone Associates (2018-02-09)



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Mississauga, Ontario

122120255
Prepared by KJ on 2018-03-08
Technical Review by CC on 2018-03-08

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Remedial Action Plan


Figure No.








3

Title
Proposed Site Development Plan

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 Site Boundary
 Shoreline (February 2017)
 Site Plan
 Block Plan
 Development Blocks / Roads - Private
 Park Conveyance - Public (City of Mississauga)
 Road Conveyance - Public (City of Mississauga)

075150

metres


1:3,000 (At original document size of 11x17)

Notes

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3. Based on Development Plan provided by Giannone Petricone Associates (2018-02-09)



Québec

Ontario

Site Location

Project Location

Mississauga, Ontario

122120255

Prepared by KJ on 2018-03-08

Technical Review by CC on 2018-03-08

Client/Project

Port Credit West Village Partners Inc.

70 Mississauga Road South, Mississauga, ON

Remedial Action Plan

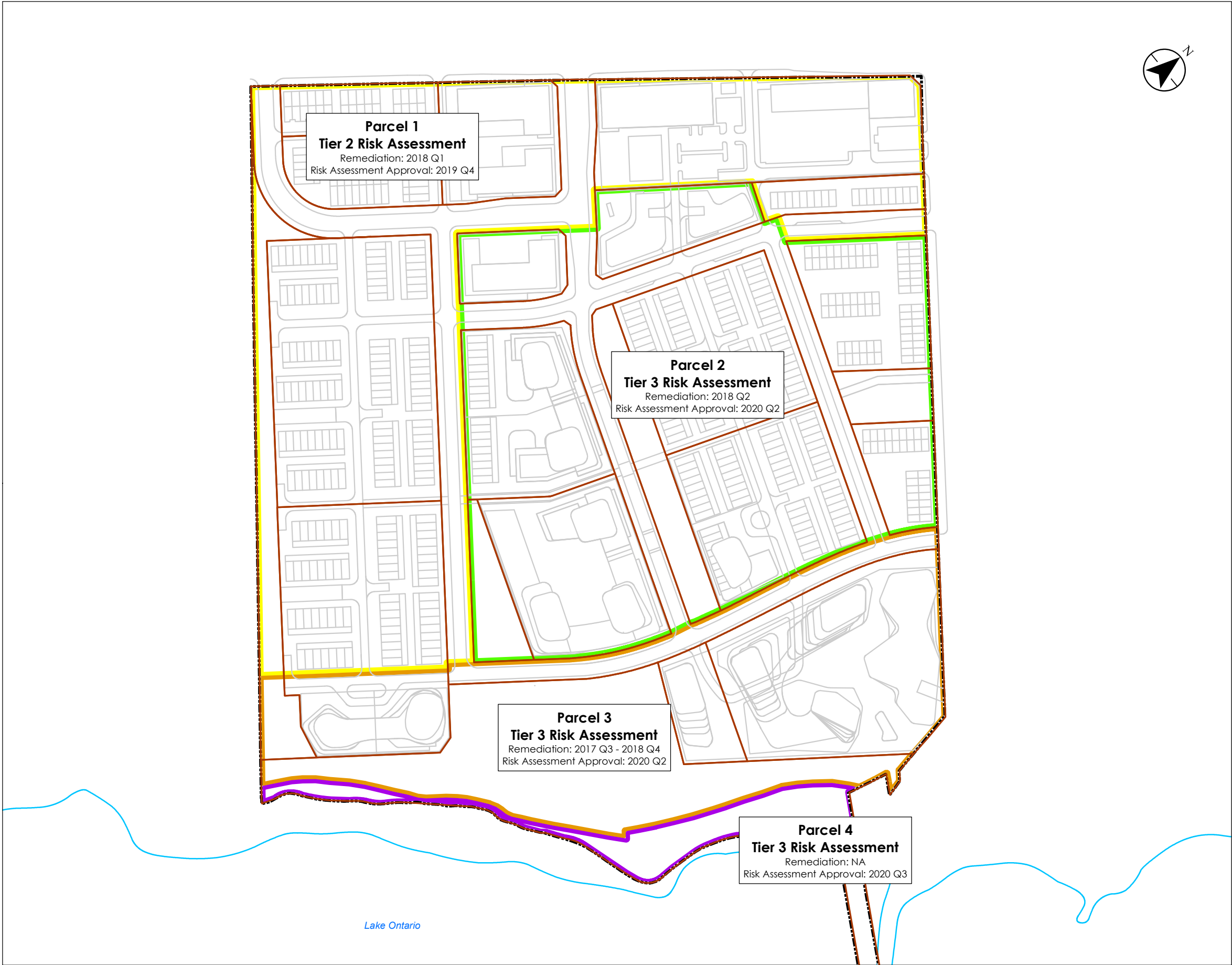
Figure No.

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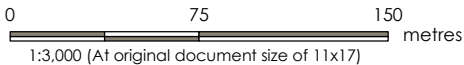
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Private and Public Lands

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- Site Boundary
- Shoreline (February 2017)
- Site Plan
- Block Plan



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.
 3. Based on Development Plan provided by Giannone Petricone Associates (2018-02-09)
 4. The final number and boundaries of each of Risk Assessment parcel may require revision as the remediation program progresses.



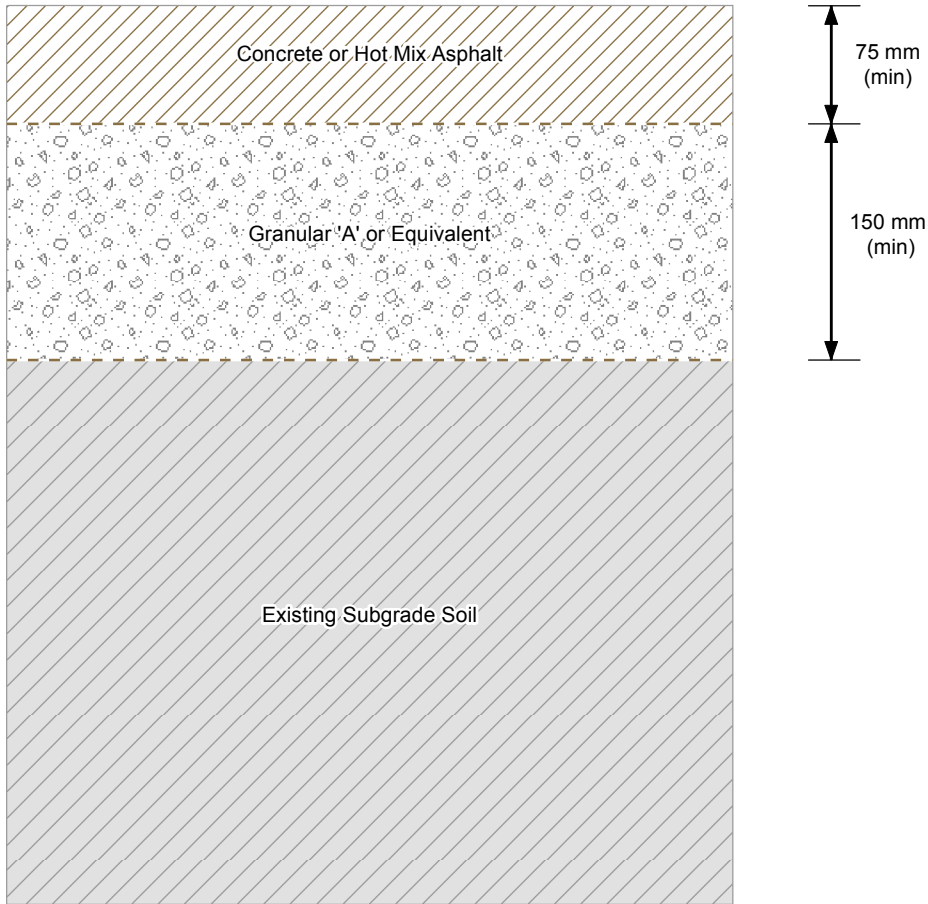
Project Location 122120255
Mississauga, Ontario Prepared by KJ on 2018-03-08
Technical Review by CC on 2018-03-08

Client/Project
Port Credit West Village Partners Inc.
70 Mississauga Road South, Mississauga, ON
Remedial Action Plan

Figure No.
5
Title
Risk Assessments/Records of Site Condition

Appendix B **GENERIC SURFACE COVER SPECIFICATION**

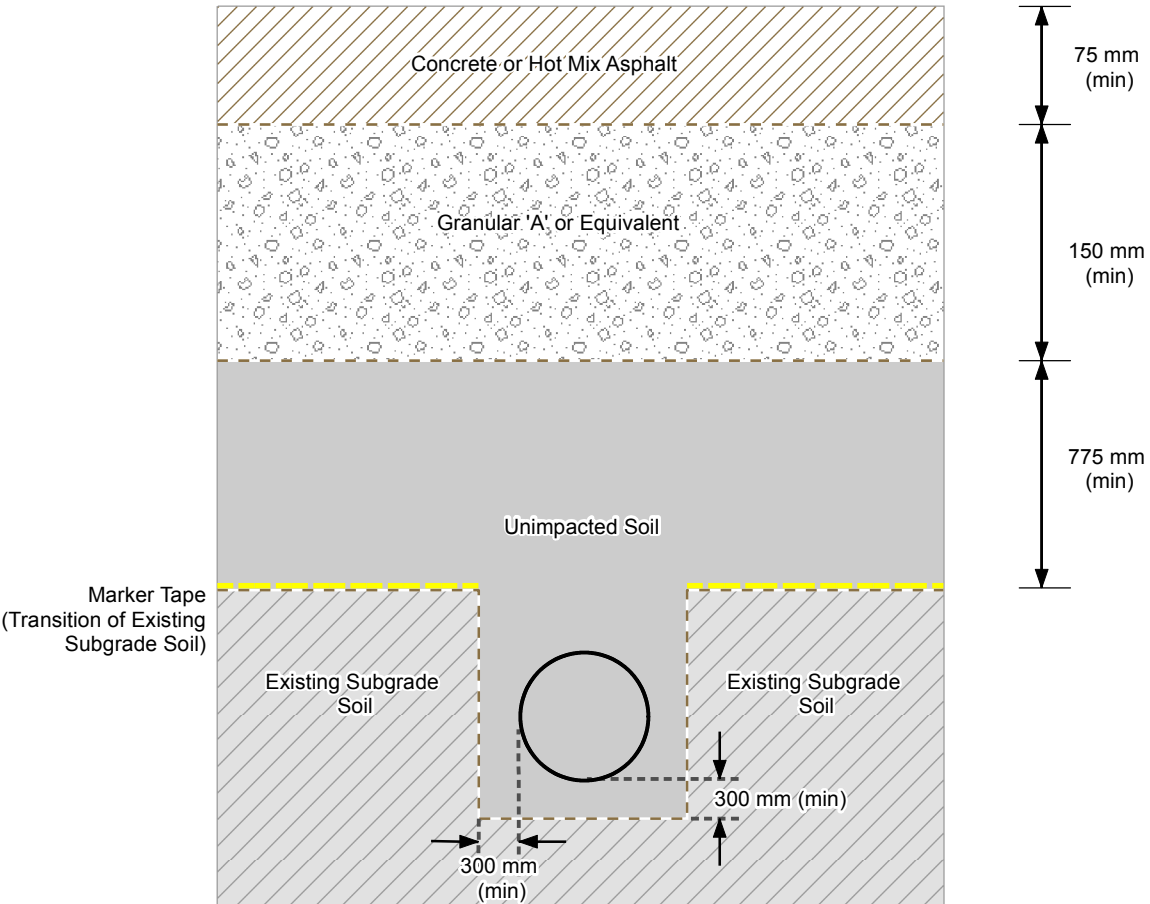
\\Ca1224-102-work_group\01221\active\122120255\updating\MD\Remediation\RAP_Report\122120255_RAP_Report_Dwg01_HardCapBarrier.mxd Revised: 2018-03-08 By: pmcser



Typical Hard Cap Barrier
Private Lands

NOT FOR CONSTRUCTION

Not to Scale



Typical Hard Cap Barrier
(Including Bedding at New or Replaced Services)

Public Lands

NOT FOR CONSTRUCTION

Not to Scale

Notes:

- Unimpacted Soil:
- (a) soil found on, in or under the Property in which no Property Specific Contaminants of Concern are present, or
 - (b) soil that meets the applicable site condition standards for the Property, and does not contain any contaminant for which no applicable site condition standard for soil is prescribed under Part IX (Site Condition Standards and Risk Assessment) and which is associated with any potentially contaminating activity described in the Risk Assessment



Project Location
Mississauga, Ontario

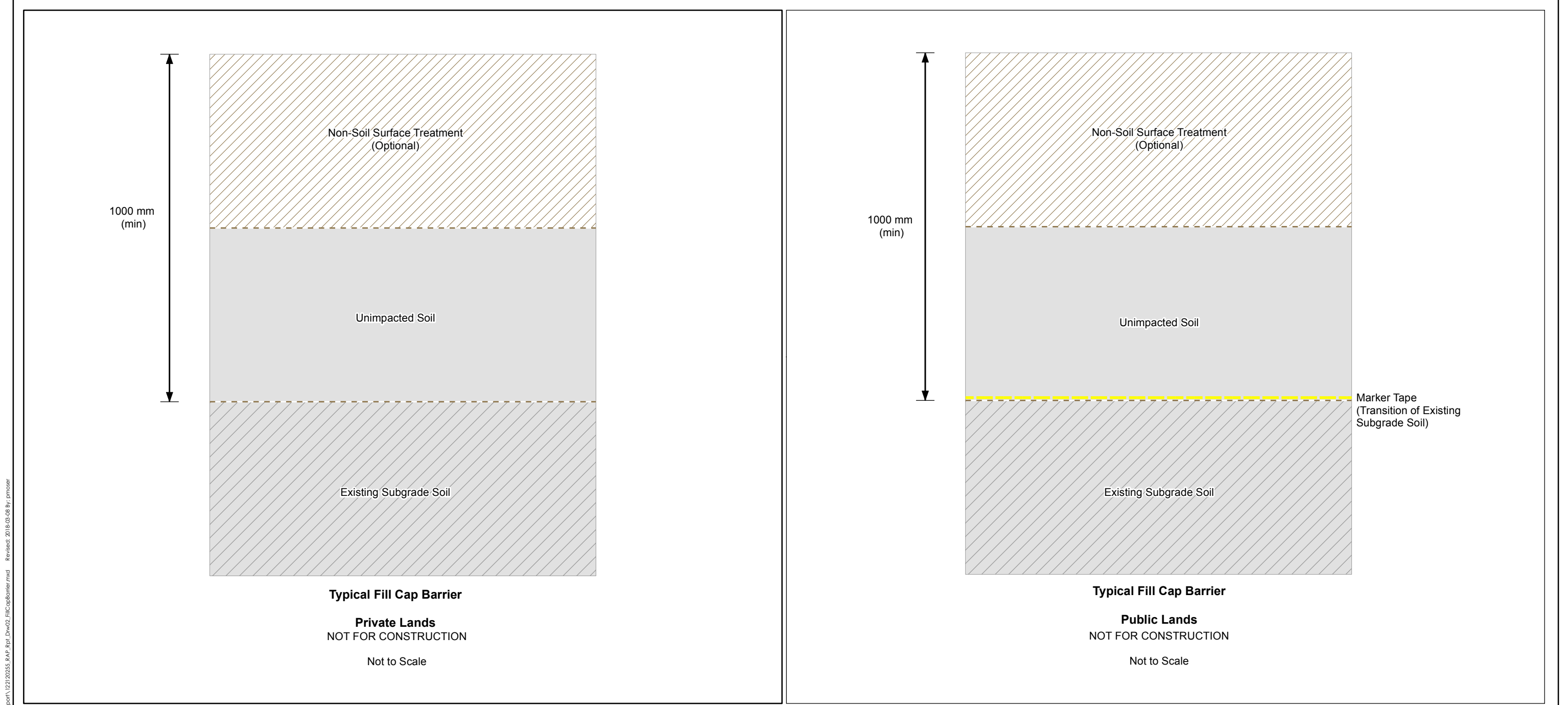
122120255 REVA
Prepared by PRM on 2018-03-08
Technical Review by CC on 2018-03-08

Client/Project
Port Credit West Village Partners Inc.
70 Mississauga Road South, Mississauga, ON
Remedial Action Plan

Drawing No.
1

Title

**Conceptual Design of Typical Hard Cap
Barrier (Public and Private Lands)**



\\Ca1224-102\work_group\01221\active\122120255\updating\MD\Remediation\RAP_Report\122120255_RAP_Report_Dwg02_FillCapBarrier.mxd Reviewed: 2018-03-08 By: pmoeir

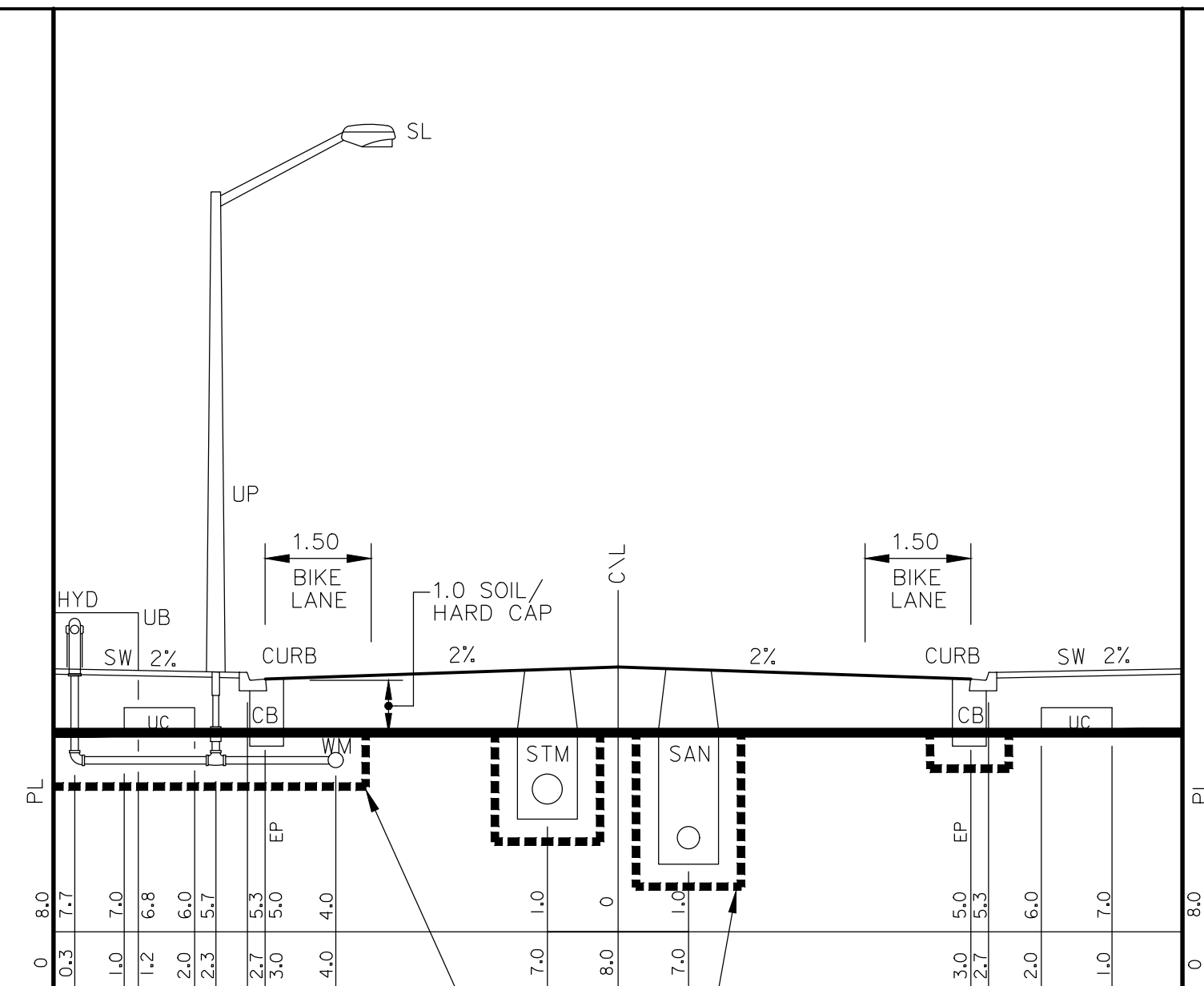
Notes:
Optional non-soil surface treatment :
Suitable materials include asphalt, concrete, concrete stone pavers, brick, or aggregate
Unimpacted Soil:
(a) soil found on, in or under the Property in which no Property Specific Contaminants of Concern are present, or
(b) soil that meets the applicable site condition standards for the Property, and does not contain any contaminant for which no applicable site condition standard for soil is prescribed under Part IX (Site Condition Standards and Risk Assessment) and which is associated with any potentially contaminating activity described in the Risk Assessment



Project Location
Mississauga, Ontario
122120255 REVA
Prepared by PRM on 2018-03-08
Technical Review by CC on 2018-03-08
Client/Project
Port Credit West Village Partners Inc.
70 Mississauga Road South, Mississauga, ON
Remedial Action Plan
Drawing No.
2
Title
Conceptual Design of Typical Fill Cap Barrier (Public and Private Lands)

Appendix C GENERIC UTILITY CROSS-SECTIONS (PUBLIC RIGHT-OF-WAYS)

LAKE STREET CAMPUS



LEGEND

- | | | |
|------|--|-------------|
| EP | - EDGE OF PAVEMENT | BEDDING ON |
| CB | - CATCH BASIN | EITHER SIDE |
| CURB | - CURB OR CURB AND GUTTER | (TYP.) |
| C/L | - CENTRELINE | |
| GAS | - GAS MAIN | |
| HYD | - FIRE HYDRANT | |
| HYDV | - FIRE HYDRANT VALVE | |
| PWV | - PRIVATE WATER VALVE | |
| PL | - PROPERTY LINE | |
| SL | - STREETLIGHT | |
| SW | - SIDEWALK | |
| SAN | - SANITARY SEWER | |
| STM | - STORM SEWER | |
| UB | - UTILITY BOX (HYDRO,TELECOMMUNICATIONS) | |
| UC | - UTILITY CORRIDOR (HYDRO,TELECOMMUNICATIONS,SL,GAS) | |
| UP | - UTILITY POLE | |
| WM | - WATERMAIN | |

METRIC

ALL DIMENSIONS IN METRES

NOTES

1. HYDRO, GAS, TELECOMMUNICATIONS AND SL CORRIDOR TO HAVE A MINIMUM COVER OF 0.965m.
2. WATERMAIN TO HAVE A MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
4. A 0.4m - 0.6m CLEARANCE MUST BE MAINTAINED BETWEEN CABLES AND HYDRANTS.
5. A 0.3m CLEARANCE MUST BE MAINTAINED BETWEEN WATERMAINS AND UTILITY POLES.
6. HARDCAP RISK MANAGEMENT MEASURE:
SURFACE TREATMENT (ASPHALT OR CONCRETE), REQUIRED BEDDING, AND UNDERLAYING UNIMPACTED SOIL SHALL BE A MINIMUM OF 1.0m THICK.
"SUBJECT TO APPROVAL OF THE CITY OF MISSISSAUGA"
7. SOIL CAP RISK MANAGEMENT MEASURE: LANDSCAPE SURFACE TREATMENT AND UNDERLAYING UNIMPACTED SOIL SHALL BE A MINIMUM OF 1.0m THICK.
"SUBJECT TO APPROVAL OF THE CITY OF MISSISSAUGA"
8. NEW OR REPLACED UTILITIES REQUIRED BENEATH THE 1.0m SOIL/HARDCAP MUST INCLUDE:
"SUBJECT TO APPROVAL OF THE CITY OF MISSISSAUGA"
 - UNIMPACTED SOIL FROM TOP OF UTILITY TO BOTTOM OF 1.0m HARD/SOIL CAP.
 - 300mm (MINIMUM) UNIMPACTED SOIL/BEDDING ON EITHER SIDE & BELOW INSTALLED UTILITY.

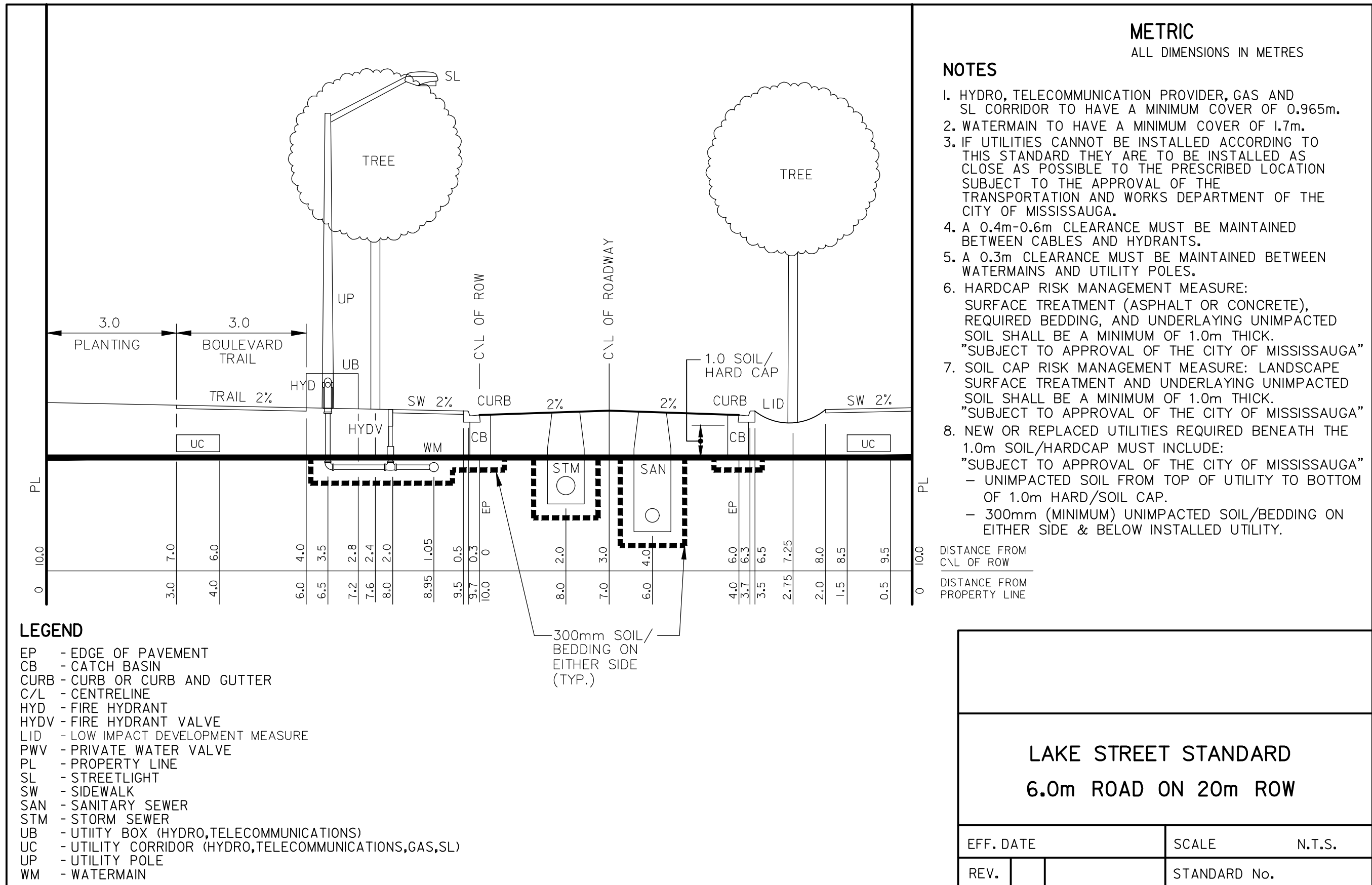
DISTANCE FROM
C\L OF ROWDISTANCE FROM
PROPERTY LINE

LAKE STREET STANDARD

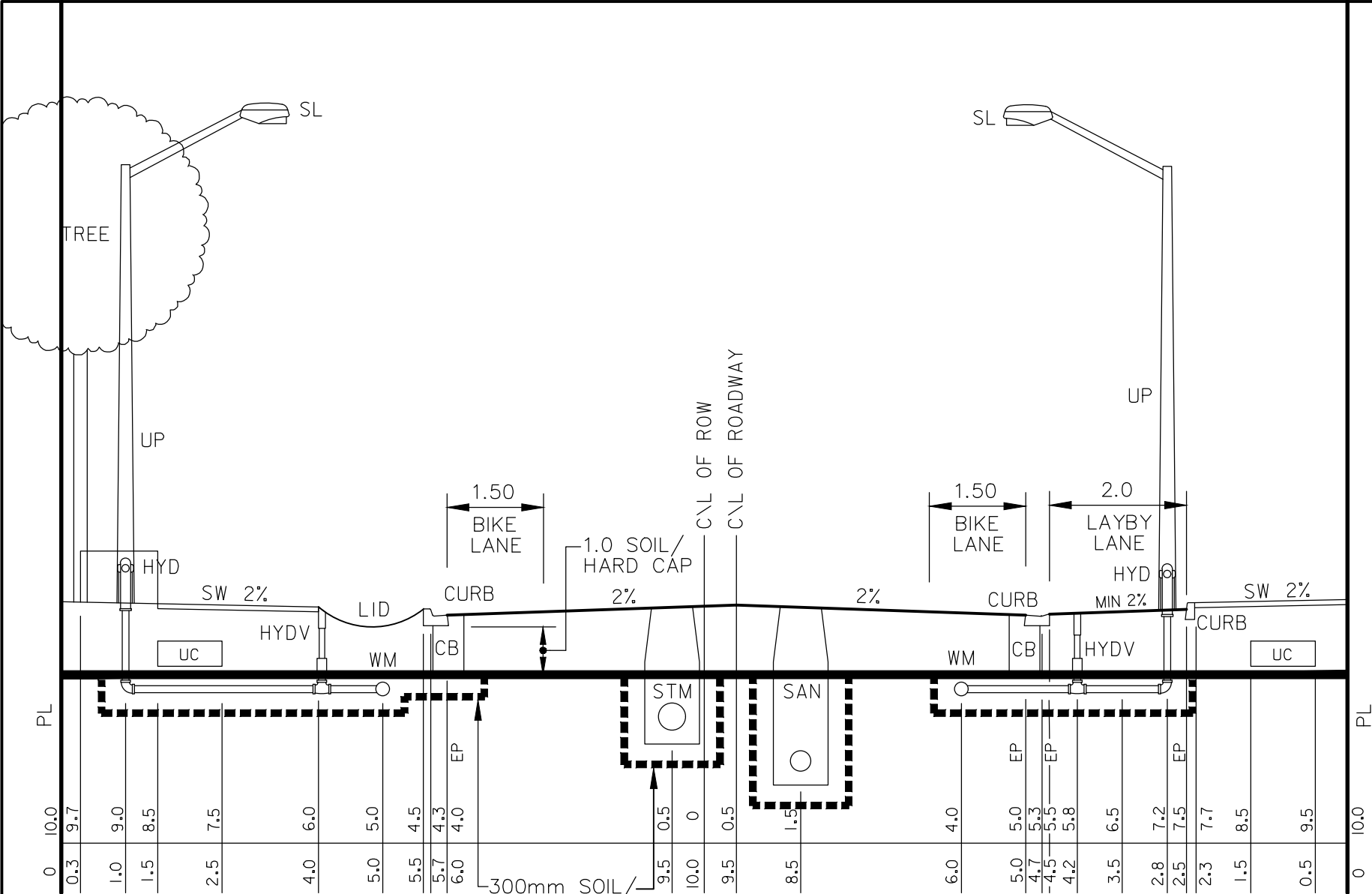
10.0m ROAD ON 16m ROW

EFF. DATE			SCALE	N.T.S.
REV.			STANDARD No.	

LAKE STREET



PORT STREET



LEGEND

- EP - EDGE OF PAVEMENT
- CB - CATCH BASIN
- CURB - CURB OR CURB AND GUTTER
- C/L - CENTRELINE
- HYD - FIRE HYDRANT
- HYDV - FIRE HYDRANT VALVE
- LID - LOW IMPACT DEVELOPMENT MEASURE
- PWV - PRIVATE WATER VALVE
- PL - PROPERTY LINE
- SL - STREETLIGHT
- SW - SIDEWALK
- SAN - SANITARY SEWER
- STM - STORM SEWER
- UB - UTILITY BOX (HYDRO, TELECOMMUNICATIONS)
- UC - UTILITY CORRIDOR (HYDRO, TELECOMMUNICATIONS, GAS, SL)
- UP - UTILITY POLE
- WM - WATERMAIN

METRIC

ALL DIMENSIONS IN METRES

NOTES

1. HYDRO, TELECOMMUNICATION PROVIDER, GAS AND SL CORRIDOR TO HAVE A MINIMUM COVER OF 0.965m.
2. WATERMAIN TO HAVE A MINIMUM COVER OF 1.7m.
3. IF UTILITIES CANNOT BE INSTALLED ACCORDING TO THIS STANDARD THEY ARE TO BE INSTALLED AS CLOSE AS POSSIBLE TO THE PRESCRIBED LOCATION SUBJECT TO THE APPROVAL OF THE TRANSPORTATION AND WORKS DEPARTMENT OF THE CITY OF MISSISSAUGA.
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 - 300mm (MINIMUM) UNIMPACTED SOIL/BEDDING ON EITHER SIDE & BELOW INSTALLED UTILITY.

DISTANCE FROM
C/L OF ROW

DISTANCE FROM
PROPERTY LINE

PORT STREET STANDARD
9.0m ROAD ON 20m ROW

EFF. DATE

SCALE

N.T.S.

REV.

STANDARD No.

PROMENADE

