Community Based Risk Assessment – Terms of Reference
Port Lands, Toronto

Prepared for

Waterfront Toronto

May 2016

CH2M HILL Canada Limited
245 Consumers Road
Suite 400
Toronto, ON M2J 1R3

Executive Summary

The Port Lands is a 356-hectare (880-acre) area bounded by the Keating Channel/Don River and Lake Shore Boulevard in the north, the Toronto Inner Harbour in the west, Leslie Street in the east and Lake Ontario and Tommy Thompson Park in the south. Formerly the largest natural wetland in Lake Ontario, the area was infilled in the early 1900s to make more land available to serve Toronto's growing industrial sector and for shipping. While still used for industrial and port purposes today, these brownfield lands are generally underutilized, lack adequate municipal services necessary for other uses and also fall within the flood plain of the Don River. Plans are underway to flood protect and revitalize this valuable part of the city, known as the Don Mouth Naturalization and Flood Protection Project (DMNP or the Project). The future uses following the revitalization include parkland, residential, institutional, community, and commercial land uses.

Two key approvals necessary to advance the revitalization efforts have already been received: the *Don Mouth Naturalization and Port Lands Flood Protection Project Environmental Assessment (DMNP EA)* and the *Lower Don Lands Master Plan Class Environmental Assessment (LDL MP EA)*. Due to the brownfield condition of the lands and the need to manage the contaminants present throughout, the Project Team, including Waterfront Toronto, City of Toronto, Toronto and Region Conservation Authority, and Toronto Port Lands Company (TPLC), is now undertaking a process outlined by the Ministry of the Environment and Climate Change (MOECC) called a Community-Based Risk Assessment (CBRA). The CBRA allows us to evaluate multiple sites across that portion of the Port Lands impacted by the construction works necessary to achieve flood protection (the CBRA Area, see Figure 1), to identify potential health concerns for people and ecological systems (wildlife and aquatic habitat) associated with existing contamination, and to outline soil and groundwater management plans to provide long term protection.

The CBRA is being completed as a voluntary undertaking to support the flood protection and revitalization of Port Lands, and will follow the process outlined in the 2014 Ontario Ministry of the Environment and Climate Change (MOECC) document, "*Draft for Discussion, Guidance for Conducting Community Based Risk Assessments (CBRAs).*"

The first step in the CBRA process is to develop a Terms of Reference (TOR) document. The TOR is a non-binding document that sets the direction for the CBRA and provides the MOECC and other review agencies with information on the CBRA Area. This information is intended to provide a strong understanding of the physical (geology, hydrogeology) and chemical (soil and groundwater quality, and contaminants of concern) profile of the area, and the planned approach for the risk assessment to be carried out. The TOR includes information on the contaminants, their anticipated impacts and how mitigation measures may be implemented. The TOR also includes general information on the communication and consultation process, and the anticipated timeline to complete the CBRA, which will ultimately allow the revitalization project to proceed. Submitting the TOR in advance of commencing the CBRA allows the MOECC and other review agencies to provide early comments and recommendations on the approach being developed.

A preliminary characterization and site condition assessment has been completed for the CBRA Area based on due diligence investigations conducted in 2015 as well as historical environmental reports and data. Several contaminants of concern have been identified including metal, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and petroleum hydrocarbons (PHCs). These contaminants are consistent with the historical activities and industrial operations previously present in the CBRA Area. PHCs have been identified as the predominant contaminant and are associated with historical gasoline, diesel and fuel oil use and storage in the CBRA Area. The TOR provides a summary and overview of the current understanding of the subsurface site conditions, including overall soil and groundwater quality.

The CBRA approach will involve dividing the CBRA Area into sub-areas (see Figure 13) and examining the potential exposure to and impacts of contaminants in the soil and groundwater. The risk of exposure to contaminants will be calculated and a series of mitigation measures, such as building physical barriers to limit contact with contaminants, will be developed to protect human health and ecological systems (including wildlife and aquatic habitat) under a variety of exposure and land use scenarios. The results of this risk assessment will also be used to support the sustainable reuse of excavated soil and sediment material within the CBRA Area, as well as to identify where risk management measures may be required for future land use.

Developing the CBRA is a dynamic and iterative process, affording a number of opportunities for identified interested parties and government agencies to provide feedback. Consultation mechanisms are expected to involve information sharing, document reviews as well as public meetings. Pre-consultation with identified interested parties and government agencies on the CBRA is scheduled to occur during the spring and summer of 2016. The draft CBRA will be submitted to the MOECC and other stakeholders in the fall of 2016, revisions are anticipated to occur in the winter of 2016 and the final CBRA will be submitted in late 2016. Submitting the draft TOR for review and comment in advance of commencing the CBRA will help ensure transparency and allow for the desired consensus to be achieved on the approach among key stakeholders and agencies. The collaborative development of the TOR and the CBRA will result in a stronger plan and one that will allow for the more timely completion of the DMNP.

Contents

Tables

Figures

Acronyms and Abbreviations

µg/g	microgram per gram
µg/L	microgram per litre
ABN	acid base neutral
APEC	area of potential environmental concern
atm-m^3/mol	standard atmosphere –cubic metre per mole
BTEX	benzene, toluene, ethylbenzene, and xylenes
CBRA	Community Based Risk Assessment
CBRA Area	area considered within the CBRA
CH2M	CH2M HILL Canada Limited
CLC	Community Liaison Committee
COC	contaminant of concern
CP	chlorophenol
CSM	conceptual site model
DCE	dichloroethylene
DCS	Decommissioning Consulting Services
DMNP or the Project	Don Mouth Naturalization and Port Lands Flood Protection Project
DNAPL	dense nonaqueous phase liquid
EA	environmental assessment
EPC	exposure point concentration
ESA	environmental site assessment
F	fraction
F4G	F4 gravimetric
GC-FID	gas chromatography with a flame ionization detector
GHD	GHD Limited
GHH	Gravimetric heavy hydrocarbon
GIS	geographic information system
ICC	industrial/commercial/community
IV	intervention value
J&E	Johnson and Ettinger
K	hydraulic conductivity
LNAPL	light nonaqueous phase liquid
LUAC	Land Owners and Users Advisory Committee
m	metre

m/day	metre per day
m/m	metre per metre
m/sec	metre per second
m/yr	metre per year
m^3	cubic metre
masl	metre above sea level
mbgs	metre below ground surface
MDL	method detection limit
MGRA	Modified Generic Risk Assessment
MOECC	Ontario Ministry of the Environment and Climate Change
MS	Microsoft
O. Reg.	Ontario Regulation
OCP	organochlorine pesticide
OTR	Ontario Typical Range
PAH	polycyclic aromatic hydrocarbon
PCA	potentially contaminating activity
PCB	polychlorinated biphenyl
PHC	petroleum hydrocarbon
PIC	public information centre
Project Team	Waterfront Toronto, City of Toronto, Toronto and Region Conservation Authority, and Toronto Port Lands Company
RA	risk assessment
RMM	risk management measure
RPI	residential/parkland/institutional
RSC	Record of Site Condition
SAC	Stakeholder Advisory Committee
SCS	Site Condition Standard
SDL	sample detection limit
SG	silica gel
Table 1 Standards	Ontario Ministry of the Environment and Climate Change Table 1: Full Depth Background Site Condition Standards
Table 3 Standards	Ontario Ministry of the Environment and Climate Change Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition
Table 9 Standards	Ontario Ministry of the Environment and Climate Change Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition
TAC	Technical Advisory Committee
TCE	trichloroethylene
TOR	Terms of Reference

TRCA	Toronto and Region Conservation Authority
USEPA	U.S. Environmental Protection Agency
VEC	valued ecosystem component
VI	vapour intrusion
VOC	volatile organic compound

1. Introduction

In August 2015, Waterfront Toronto retained CH2M HILL Canada Limited (CH2M) to provide environmental consulting services associated with developing an environmental, geotechnical, and hydrogeological strategy to support the revitalization of the Port Lands. The Port Lands is a 356-hectare (880-acre) area bounded by the Keating Channel/Don River and Lake Shore Boulevard in the north, the Toronto Inner Harbour in the west, Leslie Street in the east and Lake Ontario and Tommy Thompson Park in the south. An important goal of the revitalization is to provide flood protection for the Port Lands, parts of South Riverdale, Leslieville and the First Gulf/Unilever development site at the eastern base of the Don River, which are currently at risk of flooding from the Don River watershed.

This CBRA Terms of Reference (TOR) document has been developed in support of this revitalization effort. The CBRA allows us to evaluate multiple sites across that portion of the Port Lands impacted by the construction works necessary to achieve flood protection (the CBRA Area, see Figure 1), to identify potential health concerns for people and ecological systems (wildlife and aquatic habitat) associated with existing contamination, and to outline soil and groundwater management plans to provide long term protection.

The Port Lands was once the largest natural wetland in Lake Ontario. Beginning in the early 1900s, the area was gradually infilled to make more land available to serve Toronto's growing industrial sector and for shipping. While still used for industrial and port purposes today, these brownfield lands are generally underutilized, lack adequate municipal services necessary for other uses and also fall within the flood plain of the Don River. Plans are underway to flood protect and revitalize this valuable part of the city. The future uses following the revitalization include parkland, residential, institutional, community, and commercial land uses.

The CBRA is being completed as a voluntary undertaking to support the revitalization of the Port Lands, and will follow the process outlined in the 2014 Ontario Ministry of the Environment and Climate Change (MOECC) document, "*Draft for Discussion, Guidance for Conducting Community Based Risk Assessments (CBRAs)" (MOECC, 2014).* The first step in the CBRA process is to develop a Terms of Reference document. This CBRA TOR aligns with the CBRA process and is a non-binding document that sets the direction for the CBRA. A CBRA TOR is much like a report outline that presents the intended approach in developing the CBRA. The MOECC draft guidance documents outlines the following content requirements for the CBRA TOR:

- CBRA Area boundaries
- site characterization
- potential COCs
- anticipated receptors
- exposure pathways
- applicable toxicological data
- anticipated communication plans
- CBRA timelines.

This TOR has included the content required by the MOECC's draft guidance and has generally organized the information as follows:

- Section 1: includes the CBRA Area boundaries;
- Section 2: includes site characterization and potential COCs;
- Section 3: includes anticipated receptors, exposure pathways, applicable toxicological data;
- Section 4: includes the use of the CBRA in the implementation of the revitalization project;
- Section 5: that includes the anticipated communication plans; and
- Section 6 that includes the CBRA timelines.

The CBRA is a process best used for large areas that encompass multiple-properties supporting multiple-uses such as the CBRA Area within the Port Lands. Its methodology can be used to develop an overall approach to soil and groundwater management, and risk management in the revitalization of the CBRA Area. To facilitate the review of the CBRA, the CBRA Area will be divided into five sub-areas that reflect the planned future developed condition (see Figure 13):

1. The Water Lot: the area created by the construction of the new river valley, extending from top of bank to top of bank.
2. Essroc Quay Infill Area: the land to be created around Essroc Quay.
3. Villiers Island: existing land that will ultimately form an island once the river valley is constructed.
4. Polson Quay: existing land that will ultimately form the south side of the river valley and green spillway once the river valley is constructed.
5. Land east of the re-naturalized Don River (East Area): existing land being formed into a flood protection valley wall.

The CBRA will establish the framework for proceeding with soil reuse, groundwater control, infilling, water lot creation and infrastructure placement. In general, the CBRA follows the same risk assessment scientific process of Regulation 153/04 with certain distinctions, such as: a CBRA develops Intervention Values (IVs). IVs represent the levels at which the concentration of contaminants of concern exceed acceptable levels to be protective of human health and ecological receptors. The use and interpretation of these IVs will guide the excavation, construction and development of the environmental aspects of the flood protection project. The IVs will be applied to assess the need for Risk Management Measures (RMMs), the need for soil or groundwater treatment and to support soil and sediment reuse within the CBRA Area. The CBRA will inform soil management and reuse strategies necessary to protect human health and ecological receptors. The CBRA will also consider groundwater quality and its connection with or migration to surface water, and will similarly provide human health and ecological protection using groundwater intervention values.

This draft TOR is being submitted to several review agencies, including the MOECC, so that they have an opportunity to provide early comments and recommendations on the outlined approach before the CBRA is developed. Submitting the TOR in advance of commencing the CBRA will help maintain transparency and allow for the desired consensus to be achieved among key stakeholders and agencies. In subsequent steps, communication and consultation will be undertaken, and the CBRA will be drafted and finalized.

Additional regulatory procedures will be employed following the CBRA. For example, in O. Reg. 153/04, a change in land use to a more sensitive land use requires the completion of a Record of Site Condition (RSC). By analyzing the anticipated future land use, it is possible to identify the changes that will trigger a requirement for an RSC. These potential locations requiring an RSC are shown on Figure 15. The groundwork set out in the CBRA will support subsequent RSCs as required for future development sites.

A general overview of the area considered within the CBRA (CBRA Area) are shown on Figure 1. The CBRA addresses the area within the Port Lands identified for flood protection and revitalization pursuant to the Don Mouth Naturalization and Port Lands Flood Protection Project (DMNP).

2. CBRA Area Characterization and Site Condition

The characterization, or environmental assessment, of the CBRA Area is the foundation of the CBRA and the basis for the understanding of soil, groundwater and sediment concentrations, their location and their mobility. Often the characterization is an iterative process; as gaps are identified, the importance is evaluated and significant gaps are resolved through additional characterization. At the TOR stage, it is noted that additional characterization will be completed prior to drafting the CBRA. A considerable volume of data has been collected for the CBRA Area: most recently, a Stage 1 investigation was completed in August and September 2015 and a Stage 2 investigation was completed in November and December 2015. Much of the overview provided in this TOR is based on the data available up to the end of the Stage 1.

CH2M has developed a preliminary conceptual site model (CSM), based on a review of historical and current environmental reports and data dated from September 1991 to September 2015 (Stage 1). This includes data that have been collected and compiled by Waterfront Toronto and its partners for the CBRA Area in a Microsoft (MS) Access database. Additional data (Stage 2) was received on January 4, 2016, summarizing Waterfront Toronto's supplemental field investigation in the fall of 2015. This information will be compiled and incorporated into the Stage 2 of the DMNP project. Within the Stage 2 body of work, updates will be made to the conceptual site model.

In general, the purpose of the CSM is to provide a written or illustrative representation, or both, of the physical, chemical, and biological processes that control the transport, migration, and actual or potential impacts of contamination (in soil, air, ground water, surface water, sediments, or a combination thereof) to human receptors, ecological receptors, or both.

Consolidated available data were reviewed and interpreted to develop this CSM, which is intended to provide a summary and overview of the current understanding of the subsurface site conditions including overall soil and groundwater quality. Through the use of linked database and geographic information system (GIS) programs, various spatial maps and cross-sections have been developed to summarize the subsurface geology and hydrogeology of the CBRA Area. In addition, a series of tables and figures have been prepared to outline soil or groundwater concentrations, or both (particularly in the land areas targeted for excavation and river valley construction) and to delineate impacts laterally and vertically, to identify "hot spots." Utility pathways and geological information have been incorporated, where available, to help describe the contaminant movement and pathways. Based on the review of available information completed as part of this assessment, a series of investigative data gaps in the characterization were identified where additional information may be considered to assist in the evaluation of the data and refinement of the CSM.

The CBRA Area is presently zoned industrial with certain properties serving as industrial and commercial purposes, some are vacant, and some being used (formally and informally) as recreational space (http://www.waterfrontoronto.ca/explore_projects2/port_lands). Lands have been used for industrial purposes since the early 1900s. The current land use is shown on Figure 2. Future uses may include parkland, residential, institutional, community, and commercial land uses. The proposed future land use based on information provided by Waterfront Toronto is shown on Figure 3.

2.1 Preliminary Assessment

Various environmental investigations have been conducted within the CBRA Area since 1991, either on behalf of TPLC, Waterfront Toronto, TRCA or on behalf of existing companies or tenants within the area. Over 40 environmental reports were reviewed as part of this assessment, the details and key findings of which are summarized in Table 3-1. The summary is provided in chronological order, starting with the earliest historical report that was reviewed. Where applicable, the summary describes the investigation objectives, the scope of work, the investigation locations, and the conclusions.

These environmental reports were evaluated to allocate the information into unique areas, and potentially contaminating activities. The results are described in the followings sections on PCAs, and APECs.

2.1.1 Potentially Contaminating Activities

An important aspect of assessing the contaminant distribution on a property is an understanding potentially contaminating activities (PCAs) and areas of potential environmental concern (APECs) that may warrant further assessment and/or management. The CBRA Area consists of former industrial properties, some which have become vacant or been converted to commercial use. The CBRA Area was created between the late 1800s and the early 1900s as a result of lake filling that occurred from the eastern end of Toronto Harbour Commissioners land by filling Ashbridges Bay between the mouth of the Don River on the mainland and Fisherman's Island to the south. The lands were initially utilized for heavy industrialized uses dating back to the early 1900s. Some of these uses included petroleum refining and storage, equipment manufacturing, steel foundries, liquid and solid waste management, vehicle maintenance/repair operations, and municipal services (i.e. incineration, sewage treatment) (SLR Consulting Canada Ltd, 2009). Since the 1990s, numerous environmental investigations and studies have taken place within the area that have identified widespread soil or groundwater contamination as a result of extensive historical industrial activities.

CH2M reviewed the historical and current environmental reports made available to us to develop a current understanding of potentially contaminating activities (PCAs). Given the size and history of the CBRA Area, it is not unusual that a number of PCAs are identified. The types of PCAs are listed and prescribed in O. Reg. 153/04(Ontario Ministry of the Environment and Climate Change, 2011a) and the following PCAs have been identified within the CBRA Area:

- 7 - Boat Manufacturing
- 8 - Chemical Manufacturing, Processing and Bulk Storage
- 9 - Coal Gasification
- 10 - Commercial Autobody Shops
- 11 - Commercial Trucking and Container Terminals
- 12 - Concrete, Cement and Lime Manufacturing
- 16 - Crude Oil Refining, Processing and Bulk Storage
- 18 - Electricity Generation, Transformation and Power Stations
- 20 - Explosives and Ammunition Manufacturing, Production and Bulk Storage
- 28 - Gasoline and Associated Products Storage in Fixed Tanks
- 30 - Importation of Fill Material of Unknown Quality
- 32 - Iron and Steel Manufacturing and Processing
- 33 - Metal Treatment, Coating, Plating and Finishing
- 34 - Metal Fabrication
- 36 - Oil Production
- 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage"
- 43 - Plastics (including Fiberglass) Manufacturing and Processing
- 44 - Port Activities, including Operation and Maintenance of Wharves and Docks
- 45 - Pulp, Paper and Paperboard Manufacturing and Processing
- 46 - Rail Yards, Tracks and Spurs
- 47 - Rubber Manufacturing and Processing
- 49 - Salvage Yard, including automobile wrecking
- 50 - Soap and Detergent Manufacturing, Processing and Bulk Storage
- 51 - Solvent Manufacturing, Processing and Bulk Storage
- 52 - Storage, maintenance, fueling and repair of equipment, vehicles, and material used to maintain transportation systems

- 55 - Transformer Manufacturing, Processing and Use
- 58 - Waste Disposal and Waste Management
- 59 - Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products

The PCAs are further identified and discussed in Table 2-1.

2.1.2 Areas of Potential Environmental Concern

The identification of APEC supports the spatial analysis of the soil and groundwater chemistry so that areas of concern and their potential COCs are tracked and investigated. When PCAs are identified, APECs are assigned to these locations and the environmental investigations are reviewed to verify sufficient characterization has been completed to assess these areas. Where this is not the case, the area is noted as a data gap for further investigation.

Based on the list of PCAs, 144 APECs attributable to onsite PCAs were identified. Table 2-2 summarizes the APECs in the CBRA Area that are attributable to onsite PCAs. Figures 4A to 4E illustrate the APEC locations attributable to PCAs for the CBRA Area.

Table 2-2 describes each APEC identified and summarizes the historical and current environmental investigations from within the APEC boundaries. APECs resulting from offsite PCAs were determined based on information obtained from historical reports which indicated the offsite PCAs had the potential to impact the CBRA Area, primarily where impacted groundwater could be migrating from upgradient sources. In the far right column of Table 2-2, summary comments and conclusions are provided, such as "historical and/or current sampling activities have captured the contaminants of concern within the APEC" or "No sampling locations historical or current are associated with the APEC". For the latter, additional investigation is planned to supplement this data gap.

When this report was prepared, some areas were vacant while buildings were present in other areas. Based on a review of the available reports (refer to Table 3-1), the CBRA Area used to house numerous buildings. In the absence of additional information, CH2M has assumed the majority of the former subgrade building structures may exist, along with associated former underground utilities. Consequently, additional building-related rubble may be present below grade.

Potable water is municipally supplied. Electrical services appear (based on observations by CH2M during a Site walk) to enter buildings from overhead wires. Information related to other utilities such as natural gas, wastewater, and storm water has been documented by MMM Group in their September 15, 2015 draft report (MMM Group, 2015).

2.2 Physical Setting

2.2.1 Geology

The geological conditions in the CBRA Area have been divided into five main stratigraphic units:

1. Heterogeneous fill from ground surface up to 10.7 mbgs that is composed of unconsolidated gravel, sand, gravelly sand, sandy gravel, clay, silt, silty sand, and clayey silt. The fill may also contain debris, such as brick, glass, concrete, wood chips, charcoal, and cinders.
2. A thick, poorly graded native sand unit continuous across the CBRA Area extending to bedrock. The native sand unit also contains silty sands, sand and gravel, and localized clay layers.
3. Discontinuous peat and organic layers up to 6.8 metres (m) thick. Peat and organic layers can be interbedded with sandy and silty layers at localized locations. The organics layers are discontinuous across the CBRA Area and can be found at different depths. The organics are usually located as

layers within the native sand, or can be found above or below the native sand. Organic layer surface elevation and thickness are shown in Figures 5 and 6.

4. Discontinuous native silt, clayey silt to clay till.
5. Georgian Bay Formation shale bedrock interbedded with limestone ranging from approximately 10.8 to 19.2 mbgs. The bedrock consists of light grey, thinly bedded fissile shale, with frequent horizontal fractures, interbedded with limestone. The upper 5 m of bedrock are highly fractured, with Rock Quality Designation values of zero. The bedrock surface elevation is shown in Figure 7 and is based on historical data including Stage 1 data. A bedrock valley is expected to represent itself in the CBRA Area. During the Stage 2 investigation, the deepest section of the valley may be present in the land southeast of Commissioners Street and Cherry Street with the top of the shale bedrock at approximately 40 mbgs. Figure 7 will be updated during the CBRA.

Nine geological cross-sections were constructed to show the stratigraphic sections across the CBRA Area. Figure 8 shows the nine cross-section locations; Figures 9A through 9I are cross sections A-A', B-B', C-C', D-D', E-E', F-F', G-G', H-H', and I-I', respectively. As the cross–sections show, information gaps exist where the bottom of the native sand and the top of bedrock elevation have not been confirmed with boreholes (as shown by “To Be Confirmed” on the cross-sections). For the most part, the known information covers the depths of the excavation required for the revitalization. The uncertainty in the underlying soil is not significant from an environmental perspective but may be relevant from a geotechnical and constructability perspective.

2.2.2 Hydrogeology

Two main hydrostratigraphic units were found at the CBRA Area: (1) an unconfined fill/native sand aquifer, and (2) a weathered bedrock aquifer. The hydraulic properties of the fill and native sand layers are expected to be similar, given their predominantly coarse granular materials. Based on this understanding, and the apparent direct hydraulic connection between the two layers, groundwater will tend to flow horizontally and vertically within the fill and native sand layers, with the two layers acting as a single aquifer unit. The fill and native sand aquifer extends across the entire CBRA Area; however, again, the bottom of the native sand has not been confirmed in some portions of the CBRA Area. A weathered shale bedrock aquifer was identified underlying the fill and native sand aquifer. No aquitard separating the native sand and weathered shale bedrock units was identified; therefore, there may be a direct hydraulic connection between these two units.

Based on the Stage 1 investigations completed across the CBRA Area by GHD in late summer 2015 (GHD, 2015), a total of 73 monitoring wells have been installed, with 62 monitoring wells screened in the fill and native sand aquifer and 11 monitoring wells in the bedrock aquifer. The hydraulic properties of the aquifers across the CBRA Area were evaluated from results of single-well response tests (slug tests) conducted by GHD in August 2015. GHD conducted slug tests on 22 new monitoring wells screened in the fill. The calculated hydraulic conductivity (K) values from slug tests ranged from 2.2×10^{-6} to 8.8×10^{-4} metres per second (m/sec) for sandy fill (geometic mean 1.5×10^{-4} m/sec), and 1.5×10^{-7} to 7.5×10^{-6} m/sec for clay and silt fill (geometric mean 2.9×10^{-6} m/sec). The hydraulic conductivity results demonstrate lower conductivity layers exist within the fill layer, and the higher conductivity of the fill falls within the hydraulic conductivity range of the native sand (refer to Table 6-1).

GHD conducted slug tests in seven native sand aquifer monitoring wells across the CBRA Area. The calculated hydraulic conductivity values ranged from 1.8×10^{-4} to 8.7×10^{-4} m/sec. The geometric mean of the hydraulic conductivity within the native sand aquifer is 3.6×10^{-4} m/sec. This hydraulic conductivity is similar to the geometric mean hydraulic conductivity for the sandy fill, which provides support for combining the two stratigraphic units into one hydrostratigraphic unit.

Seven monitoring wells were screened within or across organic layers consisting of peat, organic silt, or organic clay. Hydraulic conductivity of the organic layers ranged from 3.6×10^{-7} to 1.7×10^{-4} m/sec (geometric mean of 8.7×10^{-6} m/sec). The hydraulic conductivity of the organics, at the higher end, fall within the same range of conductivities for the native sand.

GHD conducted slug tests in four wells (MW27A-15, MW31A-15, MW35A-15, and MW39A-15) screened in the shale bedrock. Hydraulic conductivity values ranged from 8.9×10^{-7} m/sec to 3.2×10^{-5} m/sec (geometric mean 8.2×10^{-6}).

The results of the slug tests to date indicate a fast to very fast hydraulic response for coarse-textured deposits (fill, sand, and sand and gravel), and for some of the organic layers.

Table 6-1 summarizes the hydraulic conductivity testing completed at the CBRA Area.

On September 1, 2015, a groundwater elevation 'snapshot' across the new GHD monitoring well network measured the depth to groundwater in the fill/native sand aquifer. The depth to groundwater ranged from 1.01 to 4.96 mbgs (74.80 to 76.06 metres above sea level [masl]) (Table 6-2; Figure 10A). In July 2013, an investigation by Decommissioning Consulting Services (DCS) found the depth to groundwater in the fill/native sand aquifer ranged from 0.2 to 2.34 mbgs (DCS, 2014) (Figure 10B). A review of numerous historical investigation reports shows that between October 1991 and September 2014, groundwater elevations in the fill and native sand aquifer were reported to be 74.22 to 77.49 masl. These historical measurements provide the expected range of water levels and across the CBRA Area and indicate the seasonal variations that may be found in the water level data. During the September 1, 2015 groundwater elevation 'snapshot', bedrock groundwater elevations were measured between 1.37 and 5.01 mbgs (74.42 to 75.16 masl).

Groundwater elevations in the fill and native sand aquifer on September 1, 2015 appear to be influenced by the level of Lake Ontario, including the Keating Channel and Shipping Channel, to the north and south, respectively. Within the fill and native sand aquifer, groundwater generally flows from east to west toward Lake Ontario, with localized northern and southern flow from the middle sections of the CBRA Area in the general direction of the Keating Channel and Shipping Channel (Figure 10A). Similar groundwater flow conditions were observed on March 9, 2009 by SLR (SLR, 2009) (Figure 10C). Based on the SLR piezometric contours in 2009, the horizontal hydraulic gradient of the fill and native sand aquifer across the CBRA Area was estimated to range between 0.003 and 0.007 metres per metre (m/m). Based on the September 1, 2015 piezometric contours, the horizontal hydraulic gradient of the fill and native sand aquifer is estimated to range between 0.004 and 0.0008 m/m. On September 1, 2015, groundwater elevations within the fill and native sand aquifer were, on average, approximately 0.2 m higher than the Lake Ontario mean daily surface elevation of 75.02 masl from the Fisheries and Oceans Canada Tidal Observations Station Toronto #13320.

Lake Ontario exhibits a major hydraulic influence on groundwater elevations within the hydrostratigraphic units across the CBRA Area. A review of historical groundwater elevations at 150 Commissioners Street over three different groundwater monitoring events in comparison with historical Lake Ontario surface elevations (CH2M, 2015) indicated that, in part, groundwater elevations are controlled by the surface elevation of Lake Ontario. Groundwater elevations were observed to correspond to the surface elevation of Lake Ontario, with a rise in Lake Ontario leading to a rise in groundwater elevations in the fill and native sand aquifer, and a decline in Lake Ontario leading to lower groundwater elevations in the fill and native sand aquifer.

Across the CBRA Area, 11 monitoring wells were screened in the shale bedrock. The groundwater potentiometric surface map for the upper weathered bedrock aquifer (Figure 11) was generated from measurements taken on September 1, 2015, with groundwater elevations ranging between 74.42 to 75.16 masl. Upper bedrock groundwater flow direction depicts groundwater flowing east to west, towards Lake Ontario, with a horizontal gradient of 0.0005 m/m.

Generally, downward hydraulic gradients were observed from the fill to the native sand layers, with a geometric mean vertical gradient of 0.04 m/m. However, in several locations across the CBRA Area, upwards hydraulic gradients were calculated from the native sand to fill layers (nested monitoring wells MW1-15, MW3-15, MW8-15, MW26-15, MW31-15, MW34-15) (Table 6-3). As discussed, based on the hydraulic properties of the fill and native sand layers being similar and the direct hydraulic connection between the two layers, groundwater will tend to flow horizontally and vertically within the fill and native sand layers, with the two layers acting as a single aquifer unit. Generally, downward hydraulic gradients also exist between the native sand layer and the upper weathered bedrock, which defines the recharge area. The exception is at three nested monitoring well locations (MW30-15, MW35-15, MW40-15), where upward hydraulic gradients are calculated to range between 0.001 to 0.004 m/m, indicating a groundwater discharge area. Groundwater is expected to eventually discharge to Lake Ontario under existing conditions, either through direct discharge or discharge to the Keating Channel or the Shipping Channel. Vertical groundwater flow velocities are estimated to range between 1 and 984 metres per year (m/yr) (Table 6-3).

Based on the geometric mean of 31.02 metres per day (m/day), hydraulic conductivity calculated for the native sand (used as a conservative conductivity for the fill), the hydraulic gradients described, and a porosity of 30 percent for the fill and native sand, the horizontal groundwater velocity is estimated to range from 30 to 189 m/yr for the fill and native sand aquifer (Table 6-4). For the upper weathered bedrock aquifer, based on the calculated geometric mean of 0.71 m/day hydraulic conductivity for the bedrock, the hydraulic gradients described, and a porosity of 2 percent, the horizontal groundwater velocity is estimated to be 6 m/yr (Table 6-4).

2.3 Soil Quality

Soil quality has been defined at various sites within the CBRA Area over the years by various historical investigations dating back to 1991, with more recent data obtained from an ongoing investigation conducted by GHD, which was partially complete when this report was developed. GHD initial soil sampling activities included advancing 127 boreholes between July 28 and August 27, 2015 (Stage 1). Two hundred and ninety-seven soil samples were collected during this work (including field duplicates and trip blanks) and submitted for laboratory analysis of one or more of the following: volatile organic compounds (VOCs), PHCs, PAHs, and metals and inorganics. During these field activities, no evidence of free product was encountered on soils (GHD, 2015). Available historical data were combined with the recent GHD investigation into a linked database and GIS systems to provide a summary of the soil quality on the CBRA Area.

In general, widespread impacts were observed across the CBRA Area, related to various contaminants of concern (COCs), based on the many former industrial operations on the CBRA Area. PHCs were observed to be the predominant COC. PHCs are widespread across most of the CBRA Area and were found at very high concentrations in some locations.

For the purpose of understanding general contaminant distribution across the CBRA Area, soil quality results have been compared to the MOECC Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Ground Water Condition for coarse grained soils (Table 9 Standards) in Figures 12A to 12J. The application of the Table 9 Standards was based on the current uses in and future plans for the CBRA Area, and the fact that some of these lands are near Lake Ontario; the Keating Channel; the Shipping Channel; the planned rerouting of the Don River; or a combination thereof. Table 9 Standards are more stringent than Table 3 Standards, which are more typically used in Toronto. It is noted that MOECC Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition (Table 3 Standards) are also applicable to portions of the CBRA Area and are considered in the selection of preliminary soil COCs in Section 2.6.

Soil with high pH was observed within the CBRA Area, as noted in Section 2.3.1; however, the MOECC's Table 1: Full Depth Background Site Condition Standards (Table 1 Standards) were not used for

comparison to the data, as it is assumed that elevated soil pH in the CBRA Area can be addressed through additional sampling activities, soil removal, further assessment of parameter mobility, or targeted screening of parameters potentially affected by high soil pH. However, these could be the applicable criteria should the pH in those areas not be addressed; therefore, consideration should be noted for future soil management activities.

Further evaluation will be completed following the Stage 2 investigation to present soil quality in the water lot and specific geological layers (for instance native sand). However, for this TOR, the examination of soil contaminant distribution involves a review of the upper fill material and the remaining subsurface soil quality separately, based on depth from the ground surface. Fill is at an average depth of 4 metres, and the upper portions of the fill (depths up to and including 1.5 mbgs), are described in Section 2.3.1. The remaining subsurface soil (which includes fill and native materials with depths greater than 1.5 mbgs), is described in Section 2.3.2. The complete soil results will be included in the CBRA once data collection activities are complete.

Subsections have been included for areas within the CBRA Area that have large amounts of imported fill placed above the grade, which may be moved and reused for fill in other parts of the CBRA Area as part of the future rerouting of the Don River.

2.3.1 Upper Fill Soil Quality Assessment and Extent of Impact

Figures 12A to 12E show the contaminant distribution for locations where one or more soil samples in the upper fill (depth up to and including 1.5 mbgs) has been detected exceeding the Table 9 Standards.

Surface soil that exhibited a pH value exceeding the applicable range of 5 to 9, and thus requiring further assessment, was found in 22 locations across the CBRA Area:

DCS BH-103	MW27A-15	SLR BH121	SLR BH125	SLR BH168
DCS BH-105	MW8A-15	SLR BH122	SLR BH127	SLR BH170
DCS BH-111	SLR BH106	SLR BH123	SLR BH137	
DCS BH-113	SLR BH108	SLR BH123	SLR BH142	
GAL - BH 14-1 (130)	SLR BH114	SLR BH124	SLR BH159	

Most soil sampling for PHCs took place at depths greater than 1.5 mbgs; however, surface soil data was collected from approximately 60 locations and the following characterization is based on the results of these locations. PHCs are found to occur at concentrations exceeding the Table 9 Standards across the CBRA Area at areas north of Polson Street, east and west of Cherry Street, south of Villiers Street, and east of the Don Roadway. Table 9 Standards exceedances are noted in approximately 50 percent of the surface soil locations analyzed. Maximum concentrations are found at CH2MHILL BH-168 (fraction [F]1 – 8,840 micrograms per gram [µg/g]) at the Villiers Street property, SLR BH144 (F2 – 16,000 µg/g) and SLR BH138 (F4 – 30,000 µg/g) on the former Imperial Oil lands, and SLR BH157 (F3 – 6,700 µg/g) at the south end of the CBRA Area, north of the Shipping Channel.

The greatest volume of impacted soils appears to be centralized over the lands commonly referred to as “former Imperial Oil lands,” which have been occupied by a number of oil companies since 1925. The location of this area is shown on Figure 1. Historical spills had been noted, and a LNAPL recovery systems operated, during the 1990s.The extent of this surficial impacted soil was defined in Stage 2 to assist in developing the estimated extent of the impact. With the identification of NAPL in these lands during Stage 2, further characterization is planned to complete the understanding and format plans for remediation, excavation and/or in-situ management.

VOCs detected in the surface soils exceeding the Table 9 Standards were mainly benzene, toluene, ethylbenzene, and xylenes (BTEX), with the greatest concentrations (xylenes up to 11,000 µg/g) found at locations with PHC impacts (CH2MHILL BH-162, CH2MHILL BH-168, and MW20A-15) in the Villiers Street

property. Other parameters exceeding the Table 9 Standards included 1,3-dichloropropene, trans-1,2-dichloroethylene (DCE), trichloroethylene (TCE), and vinyl chloride, each with concentrations at or less than 0.6 µg/g. Additional parameters exceeding the Table 9 Standards were n-hexane, acetone, and cis-1,2-DCE with concentrations at or less than 1.6 µg/g. The chlorinated VOCs were found at MW20A-15.

A number of VOCs had method detection limits (MDLs) exceeding the Table 9 Standards, mainly where the sample had to be diluted due to high PHC or VOC concentrations.

PAHs in soil were found exceeding the Table 9 Standards in approximately 60 percent of the locations, with the greatest concentrations found at MW39A-15, located at the northwest corner of the Don Roadway and Villiers Street. The parameters with the greatest concentrations were fluoranthene, with 205 µg/g, and pyrene, with 171 µg/g.

Approximately half of the locations where surface soil samples were collected exceed the Table 9 Standards for inorganics. Concentrations exceeding 1,000 µg/g were found for lead at various locations across the CBRA Area: north of the Shipping Channel at GOLDER BH4 (2,600 µg/g), north of 309 Cherry Street at SLR BH125 (1,900 µg/g), south of Commissioners Road at SLR BH167 (1,600 µg/g), south of Villiers Street at CH2MHILL BH-157 (1,320 µg/g), and centralized on the CBRA Area at SLR BH131 (1,200 µg/g). Other inorganics found at high concentrations were zinc (up to 923 µg/g at CH2MHILL BH-157), chromium (up to 714 µg/g at MW8A-15), barium (up to 540 µg/g at CH2MHILL BH-157), copper (up to 420 µg/g at SLR BH126), arsenic (up to 220 µg/g at SLR BH103), and nickel (up to 165 µg/g at BH56-15).

Polychlorinated biphenyls (PCBs) were sampled for in the surface soil at 22 locations, and 2 locations had detected concentrations marginally greater than the Table 9 Standards at DCS BH06-7(0.6 µg/g) and DCS BH06-08 (0.5 µg/g). The other locations were less than the Table 9 Standards or were not detected exceeding the MDLs.

Some acid base neutral (ABN), chlorophenol (CP), and organochlorine pesticide (OCP) parameters were analyzed as part of historical laboratory scans, and locations sampled were analyzed for one or more parameters. The exceedances of the Table 9 Standards were due to elevated MDLs, and there were no detected concentrations greater than these Standards.

2.3.1.1 Villiers Street Bioremediation Soil Piles

The following information was compiled from the Biopile Soil Sampling Summary Reports (Jacques Whitford Stantec Limited, 2009; Stantec Consulting Ltd, 2013). The results have not yet been incorporated into the project database; as such, the figures included herein do not include these data.

In 2007, approximately 31,750 cubic metres (m^3) of PHC- and BTEX-impacted soil were relocated from source sites to the Villiers Street "Bioremediation site" (location shown on Figure 1) with the intended plan to reuse the treated soil as backfill material. Bioremediation included mixing or 'turning' the soil with an Allu Bucket and the addition of nutrients to promote microbial growth and encourage the degradation process. A feasibility study (laboratory-scale) indicated the sustained rates for F2 and F3 biodegradation to be 9.9 to 11.7 µg/g per day (Jacques Whitford Stantec Limited, 2009; Stantec Consulting Ltd., 2013).

Analytical results from 2009 indicated 60 percent of the biopile rows have been remediated to concentrations less than Table 3 Industrial/Commercial/Community Standards, and 12,700 m^3 of material still required further biodegradation. Results from 2013 from the north portion of the Villiers Street site indicated that 5,600 of 11,000 m^3 met the Table 2 Residential/Parkland/institutional Standards. Sampling for both these events in 2009 and 2013 was from the first 1.0 or 0.3 mbgs, respectively (Jacques Whitford Stantec Limited, 2009; Stantec Consulting Ltd, 2013).

2.3.1.2 Imported Shale at 101 Commissioners Street, and at 1 & 17 Basin Street

A total of 37,260 m^3 of shale were imported to the area addressed as 101 Commissioners Street and 1 & 17 Basin Street in 2012 and 2013 (location shown on Figure 1). The collection and analysis of 141 samples took place during the removal of the material from the source site and the material met the MOECC Table 1 Standards for property uses other than agriculture (SPL, 2013). GHD conducted some investigation within this area, but began the collection of their samples from below the imported material.

2.3.1.3 Imported Fill at 99 Commissioners

Soil was imported to the property at 99 Commissioners (location shown on Figure 1) at some point after the 2008 SLR investigation, and was used to bring the elevation of the existing surface up approximately 2 to 2.5 m (based on the elevations of the SLR locations). The material was placed around the existing building and parking lot. Two samples were collected during the GHD investigation of the imported soil at BH91-15 and MW35B-15, which were analyzed for PHCs, PAHs, VOCs, and inorganics. There were no parameters with concentrations exceeding the Table 3 or Table 9 Standards. Based on these sampling results, the material met the Table 1 Standards.

2.3.2 Subsurface Soil Quality Assessment and Extent of Impact

Over 250 locations were sampled from the subsurface soils (deeper than 1.5 mbgs) based on data presently available in the database. Contaminant distribution figures outlining locations where one or more soil samples has been detected exceeding the Table 9 Standards is shown on Figures 12F to 12J.

One subsurface soil sample exhibited a pH value exceeding the applicable range of 5 to 11 at BH119-15. This sample location requires further assessment.

PHCs were sampled for in the subsurface soils at over 250 locations. Approximately 50 percent of locations were impacted at levels exceeding the Table 9 Standards. Impacted areas were generally centralized on the CBRA Area, and areas west of Cherry Street and east of the Don Roadway appeared to have more areas with concentrations less than the Standards. The maximum PHC concentrations found across the CBRA Area were: 6,900 µg/g for F1 at SLR BH140, just east of Cherry Street on the former Imperial Oil lands; 51,000 µg/g for F2 and 48,000 µg/g for F3 at GAL - BH 14-1 (54) located on 54 Commissioners, just north of the Imperial Oil lands and east of 309 Cherry Street; and 44,000 µg/g for F4 at BH109-15, on the very south end of the CBRA Area, north of the Shipping Channel. General site locations are shown on Figure 1.

VOCs detected in the subsurface soils at levels exceeding the Table Standards were largely BTEX (similar to the surficial soil), with the highest concentration at 1,700 µg/g for xylenes at CH2MHILL BH-163 on the Villiers Street property. Other VOCs detected included compounds such as 1,1,1-TCE (up to 38 µg/g at SLR BH146), acetone (up to 500 µg/g at SLR BH149), and dichloromethane (up to 460 µg/g at CH2MHILL BH-163). A number of VOCs had MDLs exceeding the Table 9 Standards, mainly at locations where the sample had to be diluted due to high PHC or VOC concentrations.

PAHs in soil were found exceeding the Table 9 Standards in approximately 50 percent of the locations, with the greatest concentrations found at GAL BH14-1 (54) (1.5-3.0 mbgs) with PAHs up to 5,100 µg/g. The parameters with the greatest concentrations were naphthalene, 1-,&2-methylnaphthalene and phenanthrene.

Approximately half of the subsurface soil locations exceed the Table 9 Standards for inorganics. Significant concentrations were noted for copper (up to 1,200 µg/g at GOLDER BH12, north of the Keating Channel), lead (up to 3,700 µg/g at GOLDER BH14), mercury (of up to 5.31 µg/g at BH105-15), and zinc (up to 1,800 µg/g at BH107-15).

PCBs were analyzed in subsurface soil at 21 locations and no detected concentrations were less than the Table 9 Standards.

Some ABN, CP, and OCP parameters were analyzed as part of historical laboratory scans, and sampled locations were analyzed for one or more parameters. The exceedances of the Table 9 Standards were due to elevated MDLs, and there were no detected concentrations exceeding these Standards.

2.4 Groundwater Quality

Groundwater quality from the GHD 2015 Port Lands Investigation (GHD, 2015) was used as an indicator of current conditions, with historical data noted for supporting either gaps in data or confirming extents of impacts. As of August 27, 2015, GHD had installed approximately 72 new groundwater monitoring wells, consisting of 11 bedrock wells and 61 overburden wells (11 wells to 10 mbgs, 25 wells to 7 mbgs, and 25 wells to 3 mbgs). Including the historical investigations with available data to use for this review, approximately 193 monitoring wells have been installed throughout the CBRA Area at varying depths ranging from 0.35 to 24.8 mbgs. GHD collected groundwater samples for analysis of VOCs, PHCs, PAHs, and metals and inorganics. GHD indicated that there was no evidence of LNAPL or dense nonaqueous phase liquid (DNAPL) at the monitoring wells sampled in July and August, 2015(GHD, 2015). Refer to Section 2.7 for additional information on current understanding of LNAPL.

As noted in the previous section, based on the current use and future plans of the CBRA Area, the MOECC Table 9 Standards (for within 30 m of a waterbody) were applied for the purpose of understanding general contaminant distribution within the CBRA Area. The complete groundwater results will be included in the CBRA once data collection activities are complete. Contaminant distribution figures outlining locations where one or more shallow or intermediate groundwater samples has been detected exceeding the Table 9 Standards are shown on Figures 12K to 12N, while the contaminant distribution figures for the bedrock unit are shown on Figures 12O to 12R. Again, it is noted that the Table 3 Standards are also applicable to portions of the CBRA Area and are considered in the selection of preliminary groundwater COCs in Section 2.6.

2.4.1 Upper Groundwater Quality Assessment and Extent of Impact

For this assessment, groundwater data that were not collected from the bedrock were collectively assessed and summarized. The most recent groundwater quality from the GHD 2015 Port Lands Investigation (GHD, 2015) was used as an indicator of current conditions, with historical data noted for supporting either gaps in data or confirming extents of impacts.

PHCs were found exceeding the Table 9 Standards across the CBRA Area, with the following maximum concentrations found for each of the fractions during the 2015 sampling: 11,100 micrograms per litre (µg/L) of F1 at MW20B-15; 11,200 µg/L of F2 and 11,700 µg/L of F3 at MW18A-15; and 1,380 µg/L of F4 at MW23-15. These are all situated east of the Don Roadway, and these concentrations were generally 1 to 2 times the order of magnitude of the surrounding areas that were part of the investigation. Areas west of Cherry Street and east of the Don Roadway were found at lesser concentrations, with some areas less than both MOECC Standards. The area west of MW18A-14 was inaccessible during the GHD investigation and based on known operations in the past (former Imperial Oil lands) and historical sampling, it is expected to have similar or greater concentrations to the current maximums found. Additionally the area southeast of the Villiers Street and Cherry Street intersection (includes 309 Cherry Street property) is expected to have high concentrations of PHCs based on previous investigations.

Historical groundwater sampling has indicated concentrations higher than observed during the GHD sampling event, with concentrations up to 76,000 µg/L of F2 and 120,000 µg/L of F3 PHCs at MTE MW7-08 in 2008 on the 309 Cherry Street property (no report was available, but results were included in the database from Waterfront Toronto), and 103,000 µg/L of F1 PHCs at CH2MHILL BH-168 in 2005 at the Villiers Street site. High concentrations of F2 and F3 PHCs have also been found north of the Keating Channel at 480 Lake Shore Boulevard at GOLDER BH12 (22,000 µg/L and 12,000 µg/L, respectively) and in the former Imperial Oil lands at SLR BH144 (30,000 µg/L and 33,000 µg/L, respectively).

VOCs detected at concentrations exceeding the Table 9 Standards during the 2015 sampling event were found at two locations. MW9A-15 reported concentrations of chlorinated VOCs up to 522 µg/L (vinyl chloride) in the well screened from 4.42 to 7.47 mbgs, with only vinyl chloride exceeding the Table 9 Standard in the upper (B) well screened from 1.52 to 3.05 mbgs. MW20B-15 reported BTEX concentrations up to 6510 µg/L (xylenes) and some chlorinated VOCs up to 23.9 µg/L (cis-1,2-DCE). The chlorinated VOCs at these two locations are likely unrelated, as they are located on separate ends of the CBRA Area.

Historical sampling for VOCs at 309 Cherry Street indicate high concentrations of BTEX, up to 3,000 µg/L (benzene), and some exceedances of vinyl chloride (2.9 µg/L) and cis-1,2-dichloropropene (6.5 µg/L) in 2008. In the Villiers Street site, BTEX concentrations of up to 46,300 µg/L (toluene) and chlorinated VOC concentrations of up to 9,700 µg/L (cis-1,2-DCE) were detected in 2005 at sampling location CH2MHILL BH-168. Chlorinated VOCs have also been reported at Terrapex MW101, located at the north end of the CBRA Area, with concentrations of up to 321 µg/L (trans-1,2-DCE).

PAHs were found in low concentrations (less than 4 µg/g) exceeding the Table 9 Standards for the 2015 sampling event. Detected concentrations were present in most of the collected samples across the CBRA Area, possibly indicating the presence of a widespread PAH issue; however, based on the nature of PAHs and their tendency to sorb to soils, the concentrations may not be groundwater-related and may be due to entrained sediment in the water samples, which tend to bias the PAH results high. CH2M understands that during the current GHD investigation, groundwater monitoring wells were purged using inertia techniques and dedicated Waterra tubing equipped with a foot valve. For future sampling events, if site conditions and time permit, consideration may be given to using low-flow sampling techniques and equipment, particularly for PAH and other organic-based parameters, to assess whether the current results are indicative of current conditions or potentially associated with suspended particulate in the samples.

Groundwater inorganic exceedances of the Table 9 Standards were limited to one location in the overburden, MW9A-15, with a concentration of chloride reported at 2,550,000 µg/L. The other inorganic concentrations were less than the Standards during the 2015 GHD investigation (GHD, 2015).

Historical exceedances of inorganics included mercury in 2005 at 12 locations on the Villiers Street property, with concentrations of up to 17.2 µg/L; and mercury, lead, and copper in 2008 on the 309 Cherry Street property, with concentrations up to 0.87 µg/L, 1,140 µg/L and 138 µg/L, respectively. These findings were not reflected in the recent GHD investigation, as all reported concentrations of mercury were at or less than the MDL of 0.01 µg/L, and the 309 Cherry Street property falls mostly outside of their investigation area.

PCBs were not analyzed as part of the GHD investigation, and were generally nondetect in historical sampling, except for 142 µg/L reported in 2004 at Terrapex MW101, located at the north end of the CBRA Area, significantly exceeding the Table 9 Standards. This report was not made available for review; therefore, CH2M could not confirm the result.

ABNs, CPs, and OCPs were not analyzed as part of the GHD investigation and when analyzed during historical investigations no exceedances of the Table 9 Standards were identified.

2.4.1.1 Groundwater in the Native Materials

Of the exceedances in the upper groundwater described in the previous paragraphs, only a small portion occur in the native materials; the samples are typically deeper to depths of 13.7 mbgs in some cases.

Table 9 Standards were exceeded in 5 of 23 locations screened in the native materials: F2 and F3 PHC exceedances occurred at MW23A-15 and MW32B-15; PAH exceedances occurred at MW27A-15 and MW3A-15; and a concentration on vinyl chloride (2.05 µg/L) detected at MW20A-15 exceeded the Table 9 Standards.

All other concentrations of parameters detected in the native materials met the Table 9 Standards based on the Stage 1 results collected by GHD.

2.4.2 Bedrock Aquifer Groundwater Quality Assessment and Extent of Impact

Eleven bedrock monitoring wells were installed as part of the initial GHD 2015 Port Lands investigations (GHD, 2015) and each location was sampled for PHCs, VOCs, PAHs, and inorganics. The exception was MW37A-15, which was reported to be damaged following installation and could not be sampled. Results from the groundwater sampling are summarized in the following paragraphs.

PHCs were not detected exceeding the MDLs, and were therefore less than the Table 9 Standards at each location.

VOCs were not detected exceeding the MDLs, apart from toluene at a concentration of 1.2 µg/L at MW30A-15. Results were therefore less than the Table 9 Standards at each location.

PAHs were not detected exceeding the MDLs in most locations; trace concentrations of a few PAHs (methylnaphthalenes, acenaphthene, and phenanthrene) were detected at six locations. The results were less than the Table 9 Standards.

Inorganics that were detected exceeding the Table 9 Standards included chloride and sodium at MW30-15, MW31-15, and MW34-15; and barium at MW34A-15. The maximum concentrations detected were 14,000,000 µg/L for chloride; 7,330,000 µg/L for sodium; and 42,300 µg/L for barium. Based on experience at other sites within the area, it is anticipated that the higher barium, sodium, and chloride concentrations are likely naturally occurring. The MDL for silver exceeded the Table 9 Standards in three samples (MW30A-15 and the parent and field duplicate sample at MW34A-15). The other concentrations at the bedrock monitoring well locations were less than the Table 9 Standards.

2.5 CBRA Data Gaps

In support of the development of the CBRA, additional soil, sediment and groundwater information will be a valuable source to provide higher certainty in the risk evaluation. A Site Characterization Plan will be developed to build on information previously collected and supplement the data set with additional information. The MOECC CBRA Guidance document speaks to a sampling plan that may not necessarily fully characterize the entire CBRA Area to MOECC Generic SCS. Several objectives of sampling and characterizing soil are presented in the MOECC CBRA Guidance document (MOECC, 2014): 1) hot spot identification to characterize the area of highest COC concentrations or 2) average concentrations to represent typical exposure.

The purpose of the supplemental investigation developed for this CBRA is threefold:

- to delineate hot spot areas,
- to investigate relevant APECs and determine exposure point concentrations (EPCs),
- to confirm remedial and RMM needs and suitable approaches.

CH2M anticipates this data gap summary will be refined and updated, as additional information becomes available and available data are further evaluated. Investigations are typically iterative and each subsequent stage closes the data gaps. It is likely that the majority of the remaining data gaps for the CBRA can be resolved in a single field investigation effort.

CH2M identified a number of data gaps related to the historical land use information, historical and current environmental investigations, and available data that may warrant further consideration during the development of the CBRA. A Site Characterization Plan will be developed prior to implementation of the CBRA to describe the investigations and effort required to close the gaps. These data gaps are summarized in Table 5-1 and the main objectives are outlined in the following paragraphs.

Additional historical land use information would be valuable for select properties in the CBRA Area. In that manner, the PCAs and APECs previously identified can be reviewed to confirm there are no new activities or areas to add to the list and the level of investigation can be reviewed to verify sufficient data is present.

CH2M received an existing MS Access database from Waterfront Toronto that included chemistry data from a number of previous investigations, for which reports had been provided for review. Upon reviewing this database, CH2M encountered a number of impediments that could be improved to make better use of the available dataset. These impediments are listed in Table 5-1.

Based on the identified APECs, there are areas where investigation is needed to determine whether an APEC has associated soil or groundwater impacts. Table 5-1 summarizes the APECs requiring investigations; these are limited to areas that have no sampling at all or are missing a specific medium (soil or groundwater). Table 2-2 provides specific details about the APECs.

Additional investigative activities will be completed to confirm remedial actions and/or risk management measures in the lands outside the water lot (i.e. the former Imperial Oil land, future parkland or development blocks) for NAPL or elevated risks related to the soil to outdoor air inhalation pathway.

Data gaps associated with portions of the CBRA Area where there is value in additional soil and groundwater characterization were also noted. These have been briefly identified in Table 5-1.

2.6 Preliminary Contaminants of Concern

Identification of the contaminants of concern is a crucial step in the CBRA so that the contaminants, or those chemicals with concentrations above a standard, are identified for further evaluation using risk assessment techniques. A rigorous process is applied to generate the COC list so that it is systematic, reproducible and defendable. That process is described below.

Contaminants of concern will be separately identified for each subarea for soil remaining in place within the subarea; the subarea potential COC list will only include data from within the subarea. An overall potential COC list will be developed to promote the optimization of soil reuse within the CBRA Area and the reference dataset will include all data within the CBRA area.

A preliminary screening process was completed to identify potential COCs. For the purpose of identifying potential COCs, the following MOECC standards were applied:

1. Sample locations currently situated within 30 m of Lake Ontario or the Don River were screened to the Table 9 Site Condition Standards [SCS]) (MOECC, 2011b). The Table 9 SCS for both soil and groundwater are applicable to all land uses.
2. Sample locations currently situated greater than 30 m of Lake Ontario or the Don River were screened to the Table 3 SCS (MOECC, 2011b). The Table 3 SCS for soil applies to either a residential/ parkland/institutional (RPI) land use or an industrial/commercial/community (ICC) land use. Soil screening was conducted for both the RPI and ICC land uses. The Table 3 SCS for groundwater applies to all land uses.

Under the future developed conditions of the CBRA Area, some data points may change in terms of requiring Table 3 or Table 9 SCS screening. This will be reviewed and revised as needed upon compilation of the complete data set; however, the screening completed herein is understood to provide a sufficient understanding of the potential COCs present in the CBRA Area for the development of the CBRA TOR.

A limited number of sample locations with elevated soil pH (i.e., greater than pH 9 in surface soil and/or greater than pH 11 in subsurface soil) were observed during the investigative work in the CBRA Area. Elevated soil pH could result in the CBRA Area being designated as a Table 1 site; however, for the purposes of this CBRA TOR, it has been assumed that these limited locations could be addressed through

additional sampling, remedial work, further assessment of parameter mobility, or targeted screening of parameters potentially affected by high soil pH. Consequently, it is assumed that Table 3 and 9 SCS and related component values will remain applicable.

Groundwater in the CBRA Area has also been identified at depths less than 1 mbgs. As groundwater is shallower than assumed in the derivation of the Table 3 and 9 SCS (that is, 3 mbgs), screening to these standards alone may not be sufficiently protective of the groundwater to indoor air vapour intrusion pathway. To address this issue during the completion of the CBRA, the Table 7 GW2 component value (MOECC, 2011c) can be applied to evaluate the potential for elevated risk to human receptors through the groundwater to indoor air pathway for volatile (that is, a chemical with a vapour pressure greater than 0.05 Torricelli and a Henry's Law Constant greater than 1×10^{-5} standard atmosphere –cubic metre per mole [atm-m^3/mol]) parameters in groundwater.

The list of COCs for initial consideration in both the human health and ecological assessments of the CBRA was determined according to the following screening process:

1. A maximum concentration was identified for each parameter. The maximum concentration in soil and groundwater was determined as either the maximum measured value or the highest detection limit (if greater than the maximum measured value) observed in the data available.

2. Parameters were retained for further consideration under the screening process for soil and groundwater if the identified maximum concentration exceeded the either the Table 3 RPI/ICC (as applicable) or Table 9 SCS, depending on the location of the samples. Tables 9-1 through 9-5 show the detailed screening process, including the measured concentrations, number of samples, and number of detects greater than the Table 3 RPI/ICC (as applicable) or Table 9 SCS in soil and groundwater in the CBRA Area. As noted, while Table 1 SCS may be applicable in areas of the CBRA Area based on elevated soil pH measurements, it is assumed that these could be addressed through additional assessment; therefore, Table 1 SCS have not been applied. Table 7 SCS may also be applicable in certain areas of the CBRA Area based on depth to groundwater; however, given the planned increased in final grade within the development blocks, a "shallow groundwater" condition may not be prevalent under future conditions. If a shallow groundwater condition does remain, it can be accounted for through screening against the Table 7 GW2 component values (MOECC, 2011c) during the CBRA.

   A number of additional screening considerations were built into this step of the screening process on a parameter-specific basis. Of particular note are the following considerations:

   a. Analytical results for methylnaphthalene in both soil and groundwater data were reported sometimes as methylnaphthalene 2-[1-] and sometimes as the separate isomers 1-methylnaphthalene and 2-methylnaphthalene. The maximum detected concentration of each isomer was summed and compared to the maximum detected methylnaphthalene 2-[1-] data. The greater of these two values was conservatively applied as a "total" methylnaphthalene concentration for comparison to the methylnaphthalene 2-[1-] Table 3 or Table 9 SCS.

   b. The evaluation of xylenes in soil and groundwater data accounted for data reported as "total" xylenes (xylene mixture), as well as the o-xylene isomer and m,p-xylene mixed isomers. For conservatism, the maximum detected value of the isomers was summed and compared to the total xylenes data value. The greatest reported xylene concentration (whether the "total" mixture or summed mixed isomers value) was applied for the screening of "total" xylene.

   c. The evaluation of 1,3-dichloropropene took into account soil and groundwater data reported as "total" 1,3-dichloropropene (mixture), as well as the cis and trans isomers. For conservatism, the maximum detected values of the isomers were summed and compared to the "total" 1,3-dichloropropene data value. The greatest reported concentration (whether the "total" mixture or summed mixed isomers value) was applied for the screening of 1,3-dichloropene.

d. The evaluation of 2,4- and 2,6- dinitrotoluene accounted for soil and groundwater data reported as 2,4- and 2,6- dinitrotoluene (mixture), as well as the individual 2,4- and 2,6- isomers. For conservatism, the maximum detected value of the isomers were summed and compared to the 2,4- and 2,6- dinitrotoluene data value. The greatest reported concentration (whether the "total" mixture or summed mixed isomers value) was applied for the screening of 2,4- and 2,6-dinitrotoluene.

e. The evaluation of PHC F1, F2, and F3 accounted for both data reported with and without BTEX; naphthalene; and PAHs, respectively, as well as historical data that reported only bulk PHC F1, F2, and F3 results. For conservatism, the greatest reported PHC fraction concentration was applied to screen each fraction, regardless of whether naphthalene or PAH data were included in the result (that is, the greater concentration between PHC F1 or PHC F1 [minus BTEX], PHC F2 or PHC F2 [minus naphthalene], and PHC F3 or PHC F3 [minus PAH]).

f. The evaluation of PHC F4 in soil considered analytical results for F4 Gravimetric (F4G)-silica gel (SG) (Gravimetric heavy hydrocarbon [GHH]-Silica). PHC F2, F3, and F4 are determined via gas chromatography with a flame ionization detector (GC-FID). Laboratories analyze and report an F4G value in case the chromatogram tracing does not return to the baseline at or before the C50 carbon range. In some cases, this can result in a PHC F4 value (by GC-FID) that did not exceed the SCS, but an F4G concentration that did exceed the SCS. Canadian Council of Ministers of the Environment guidance (2008) indicates the greater of the F4 and F4G value should be reported as the PHC F4 value, which was the approach used for this CBRA TOR.

g. Chemicals detected in soil and groundwater as part of the current and historical investigations included some naturally occurring elements and minerals with no applicable MOECC SCS. Detected parameters in soil were ruled out as COCs where possible using Ontario Typical Range (OTR) values for Region 3, as provided in Table 8.2 of the MOECC Rationale document (MOECC, 2011c) or the *Ontario Typical Range of Chemical Parameters in Soil, Vegetation, Moss Bags and Snow* (MOECC, 1999) document. The OTR values are considered representative of upper limits of typical province-wide background concentrations that are not contaminated by point sources. An OTR was not available for zirconium in soil. An alternate average zirconium concentration obtained from the United States Geological Survey document entitled *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States* (Shacklette and Boerngen, 1984) was used for screening in the absence of an OTR. Detected parameters in groundwater were ruled out as COCs where possible using the 97.5 percentile of the Provincial Groundwater Monitoring Information System data, as provided in Table 8.4 of the MOECC Rationale document (MOECC, 2011c)

3. Chemicals with no applicable MOECC SCS or available background concentration were treated as follows:

   a. Chemicals that were 100 percent nondetect in soil in groundwater were examined further to determine whether the reported maximum was based on an elevated sample detection limit (SDL). Chemicals that were 100 percent nondetect with nonelevated SDLs were not considered COCs, as they have not been detected in the CBRA Area. As the dataset comprises several years' worth of data, laboratory reporting limits and reporting accuracy may have changed over time. As such, the reported SDLs for each nondetect chemical without an applicable SCS were examined on a sampling event (date) basis. If all SDLs reported for the same sampling event were equal in value, the SDLs were considered to not be elevated. If one or more SDLs were higher than those from the same sampling event, the maximum SDLs were considered to be elevated, and the chemical was retained as a COC.

   b. Chemicals that were detected and had no applicable MOECC SCS, or were nondetect with elevated SDLs, were retained as COCs.

2.7 Nonaqueous Phase Liquid

Nonaqueous Phase Liquid (NAPL) refers to a solution of liquid contaminants that do not dissolve in or mix easily with water. Light nonaqueous phase liquid (LNAPL) refers to NAPLs that are lighter than water (that is, float on the water table), such as petroleum hydrocarbon, and dense nonaqueous phase liquid (DNAPL) refers to NAPLs that are heavier than water (that is, tends to sink once it reaches the water table), such as chlorinated compounds. The presence of NAPL at a site means an additional contaminated media beyond soil and groundwater that requires evaluation. The presence of NAPL can also have implications for the application of some of the MOECC generic standards since their development may assume no presence of NAPL.

GHD indicated in Stage 1 that there was no evidence of LNAPL or DNAPL at the monitoring wells initially sampled (GHD, 2015); however, PHC concentrations in soil and groundwater greater than free-phase thresholds and half solubilities, respectively, suggest the potential for NAPL formation. Additionally, ongoing sampling activities in Stage 2 by GHD (currently being documented) has shown evidence of NAPL in the CBRA Area. The greatest volume of NAPL may be located in the lands commonly referred to as “former Imperial Oil lands.” As previously mentioned, historical spills had been noted for these lands and a LNAPL recovery system was implemented and operated in the 1990s. This recovery system appears to still be in place in the CBRA Area today, although the status of the system is unknown.

Further investigative work is currently being completed to support the development of the CSM for the CBRA Area, and the understanding of the extent and nature of the NAPL present. The CBRA will incorporate this new information and account for the presence of NAPL in the CBRA Area.

3. Proposed Scope of CBRA

Risk assessment (RA), in the context of properties impacted by contaminants, is the process of estimating the likelihood of undesired effects on human health and the environment resulting from exposure to chemical contaminants. Three components must be present for risks to human and ecological health to exist at contaminated sites impacted by chemicals:

1. The chemical must be present at sufficient concentration to cause a possible adverse effect.
2. A receptor must be present.
3. There must be a complete exposure pathway by which the receptor can come into contact with the chemical.

These three factors are interdependent because the significance of the environmental concentration and the potential environmental or health effects depend on the pathway by which the exposure occurs. The exposure pathway, in turn, is influenced by the nature, or the behaviour, of the receptor. These components are collectively integrated into models to illustrate potential pathways and to assist in the RA process.

RA is part of a risk management approach used to determine the level of risk to human health and the environment that would result from planned activities at a property impacted by contaminants. RA is also intended to effectively focus site-specific risk management efforts and resources on reducing the overall risk at the property and directing remedial actions, if required, to the risks associated with the soil and groundwater environmental impacts.

The objectives of the CBRA are three-fold:

1. Identify potentially complete exposure pathways with risks exceeding acceptable levels for human and ecological receptors.
2. Develop Intervention Values (IVs) that can be used to understand the potential need for risk management measures (RMMs) or remediation requirements across the CBRA Area based on projected elevated risks associated with different land uses.
3. Support the sustainable reuse of excavated soil and sediment within the CBRA Area through the development of excess soil reuse guidelines.

The proposed scope and approach for the CBRA has been developed based on the data available when this report was created, and outlined thus far. The CBRA approach will involve assessing the CBRA Area in its planned future developed condition, as indicated in Figure 3. To facilitate the processing of the CBRA, and accommodate review of the CBRA by different stakeholders, the CBRA Area will be divided into five separate subareas that reflect the planned future developed condition:

1. The Water Lot
2. Essroc Quay Infill Area
3. Villiers Island
4. Polson Island
5. Land east of the re-naturalized Don River (East Area)

These site divisions are presented in Figure 13. The Water Lot is the area created by the construction of the new river valley; it extends from top of bank to top of bank. The Essroc Quay Infill Area is the land to be created around Essroc Quay. Villiers Island is existing land that will ultimately form an island once the river valley is constructed and likewise Polson Island is existing land that will ultimately form an island once the river valley is constructed. Land east of the re-naturalized Don River is existing land being

formed into a flood protection valley wall. The CBRA scope will include assessing COCs found in soil and groundwater in these five areas, as well as an assessment of NAPL, as relevant, for each area.

3.1 Preliminary Human Health and Ecological CSM

The revitalization will incorporate a variety of future land uses, including parkland, residential, institutional, community, and commercial land uses. The proposed revitilization also involves infilling the Essroc Quay, and developing an extensive water lot through the CBRA Area that will produce two new island areas. Portions of the land areas that will remain are targeted for change to a more sensitive land use and may require the filing of an RSC in the future; however, the CBRA approach does not contemplate the completion of RSCs via the CBRA effort. Lands identified for a future RSC will undergo a separate process per O. Reg. 153/04, as required, subsequent to the CBRA.

3.1.1 Hazard Identification

Hazard identification involves identifying the COCs at a given site. Preliminary COCs have been identified in soil and groundwater via screening versus Table 3 and 9 Standards in Section 2.6. The COCs in these media are considered further here within the CBRA TOR; however, additional testing was completed in fall 2015 and these new data will also be evaluated during the CBRA. These data were received January 4, 2016 and will be added to the database to support revised COC screening. Additionally, the COC screening process will be updated to divide data points into the five separate areas for processing in the CBRA. A COC list will be developed for each separate area for consideration in the CBRA. The data sets for soil and groundwater in each area will be treated as follows:

- **Soil:** Soil will be treated as one unit per subarea. This approach assumes that future construction activities as part of the revitalization could result in the mixing of surface and subsurface soil currently in place; thus, subsurface soil could become surface soil and vice versa. Soil targeted for excavation from the water lot and re-use on the land area will be incorporated into a ‘reuse’ soil data set as it is understood that this soil could be surface or subsurface soil in the land areas as part of the revitalization. Soil data collected from within the water lot that is expected to remain in place below the new river valley will be excluded from the ‘reuse’ soil data set.

  The soil data set considered for the CBRA includes data collected between 1991 and 2015 within the CBRA Area. Data for VOCs and PHCs collected before 2005 were excluded from consideration; the analytical procedures for these data do not align with current practice or standards.

- **Groundwater:** Based on the geology information available to date, two main hydrostratigraphic units were found at the CBRA Area: (1) an unconfined fill/native sand aquifer, and (2) a weathered bedrock aquifer. No aquitard separating the unconfined fill and native sand, and weathered shale bedrock units was identified; therefore, there may be a direct hydraulic connection between these two units. As a result, the data sets for these two units will not be segregated, and groundwater data will be treated as one unit.

  Groundwater concentrations older than 2 years are likely not representative of current conditions, and these data will be excluded from the CBRA provided there are sufficient current data to characterize the CBRA Area. The inclusion or exclusion of these data will be determined after the receipt of the final data set.

The MOECC has assumed a minimum separation distance of 1 m between groundwater and enclosed buildings during the development of the Table 3 and 9 Standards. As a result, if projected future groundwater levels and building scenarios indicate the potential for less than a 1 m separation distance, the CBRA will contain a secondary screening of groundwater VOCs to the Table 7 Standards (for shallow soil properties). Groundwater VOCs not retained in the primary screening against the Table 3 or 9

Standards (as applicable) will be retained for consideration as additional groundwater COCs in the CBRA (at the discretion of the Qualified Person for RA per MOECC [2005]).

Although sediment and surface water will be present in the redeveloped CBRA Area, the collection of sediment and surface water data to identify COCs within these media within the CBRA is not anticipated. Some limited sampling may be completed on sediment targeted for excavation in the Essroc Quay area; however, these data will be used to support the reuse of these materials as fill within the land areas. The potential for discharge of groundwater COCs to surface water will be assessed via modelling, and potential sediment concentrations may be assessed, as needed, based on soil results near the water lot or within the water lot at depths below the planned river valley.

3.1.2 Potential Exposure Pathways

Based on the COCs identified for soil and groundwater to date, preliminary CSMs for potential human and ecological exposure pathways in the CBRA Area have been developed. The human health CSM is presented in Figure 14A and the ecological CSM is presented in Figure 14B. These preliminary CSMs are considered applicable across the CBRA Area; however, once data collection activities are complete and the COC lists for each subarea are confirmed, the CSMs may be revised to reflect each separate subarea, as appropriate. These preliminary CSMs additionally identify the potential RMMs that may be required to block specific exposure pathways.

3.2 Exposure Assessment Approach

3.2.1 Development of Exposure Point Concentrations

Soil and groundwater characterization are likely to be based on judgmental sampling techniques, and are therefore biased toward likely worst case environmental concentrations of COCs. Spatial and temporal distributions of COCs will incorporate some of this bias, which translates into a conservative (that is, leads to an overestimate) of likely exposure for representative human receptors.

The exception is where a land use feature and significant concentrations of COCs are collocated. Use of the property at that location will tend to present an opportunity for higher estimates of exposure. For example, locating a building over high concentrations of VOCs or locating a park bench near surface contamination will bring receptors closer to those sources of COCs.

For the CBRA, exposure point concentrations (EPCs) will be developed using the site characterization data, and “exposure zones” will be developed based on anticipated site uses. Examples of exposure zones include the upper 0.5 m of soil considered to be accessible to a landscape worker or the upper 1.5 m of soil considered to be accessible to deep rooted vegetation, such as trees. Site characterization data will be grouped to best represent the various exposure zones, and statistical analysis of variability and central tendency (descriptive statistics) will be used to derive estimates of upper limit on the mean, or calculate 90th percentile of the distribution. Soil data collected within areas targeted for excavation (e.g., the water lot) will also be similarly grouped to assess the risks associated with the placement and reuse of that material within the land areas.

A statistical analysis of a dataset or subgroup of data will require, at a minimum, an assessment of the assumptions used to carry out the analysis (that is, an adequate number of observations; the quality of the observations; whether COCs were detected or nondetect and the like; an assessment of normality or population distribution shape). This assessment is applied to justify the statistical approach used to develop an exposure point concentration, either by using parametric or nonparametric methods, or by selecting the maximum detected concentration for exposure assessment.

Where required, a statistical assessment of upper limits that may be derived for use as EPCs will also consider nondetects in the dataset via application of statistical concepts in software packages such as ProUCL (USEPA, 2013) and outlined in Helsel (2005).

For some COCs, it may also be necessary to carry out hypothesis testing, to determine whether observed concentration between different areas or different groups are from the same population. This technique is usually employed to determine whether a COC is considered to be greater than or less than background concentrations.

The goal of developing an EPC using a statistical approach is to present a justifiable value that represents a best estimate of exposure, and not a maximum worst case unless that is justified. This approach is intended to reduce the degree of conservatism in the CBRA and improve the realism, as it is broadly recognized that multiple conservatisms yield dose projections that are not representative of the critical group concept (that is, the projections are representative of extreme individuals or nonplausible exposure scenarios).

Specific approaches to EPC development will be documented for each COC, with supported references to methods or software used.

3.2.2 Human Receptors

Human receptors identified for consideration within the CBRA include residents (infant, toddler, child, teen, adult, or composite receptor), recreational site visitors (infant, toddler, child, teen, adult, or composite receptor), indoor workers, outdoor workers, construction workers, and utility workers. A Female receptor will also be included in the CBRA for quantitative assessment of risk related to COCs with development effects. This receptor will be included in exposure scenarios quantitatively assessed that do not include a toddler (for example, Construction/Utility Worker, Outdoor Worker, Indoor Worker) and will assume continuous exposure without prorating for exposure frequency or exposure duration because an exposure limit may be exceeded during any one of many critical developmental periods for the receptor. Some receptors may be identified within a subarea for qualitative assessment only in the CBRA, as their exposure is less than a receptor undergoing quantitative assessment (for example, the site visitor exposure would be less than a resident exposure).

Within the planned water lot, there is some potential for human exposure to surface water and sediment. The current park development is projected to involve a series of boardwalks through the wetland area, which would limit direct contact with sediment and surface water in this area for human receptors; however, a recreational site visitor involved in boating activities on the water (for example, canoeing or kayaking) could experience some limited direct contact exposure to surface water and sediment. Although this pathway is potentially complete, the quantitative assessment of this pathway is not planned in the CBRA. Risks within the water lot, and the need for RMMs, are expected to be driven by ecological receptors; therefore, the quantitative assessment of human receptors within the water lot will not be completed. Direct contact of human receptors with surface water and sediment within the water lot will be qualitatively considered. Modelled surface water concentrations and potential sediment concentrations (based on soil results near the water lot or within the water lot at depths below the planned river valley) may be compared to MOECC generic human health component values, or other applicable values, for direct contact to support this qualitative evaluation.

Tables 11-1 to 11-4 present the exposure assumptions that will be applied to assess risk for the receptors identified for quantitative assessment.

3.2.3 Ecological Receptors

Both riparian/aquatic and terrestrial habitat are found within and surrounding the CBRA Area. Based on the riparian/aquatic resources present in the Lower Don River and Keating Channel, the ecological receptors that will likely be chosen for assessment are pelagic and benthic invertebrates, fish,

amphibians, and aquatic plants. As a result of the terrestrial resources present in the CBRA Area and the exposure pathways to be evaluated, the ecological receptors that will likely be chosen for assessment included: soil organisms, terrestrial plants, reptiles, birds, and mammals.

Valued ecosystem components (VECs) are defined as specific ecological receptors determined to be of ecological importance considering the current and proposed land use of a site. They are chosen to represent groups of species that are likely to inhabit a site and, as a result, have the potential to be affected by exposure to a chemical or other stressor. The CBRA will include the selection of representative VECs which will be used to facilitate the assessment of ecological receptors identified above based on their potential projected presence in the redeveloped CBRA Area, whether the species was indigenous to the area, the availability of applicable toxicological literature, representation of an ecological guild, and susceptibility and exposure to CBRA Area COCs. VEC selection will be conducted through a review of site specific information such as that provided via email on Monday December 7th, 2015, by Thomas Sciscione (Coordinator, Aquatic Habitat Toronto, Toronto and Region Conservation Authority; personal communication) regarding fish species present within the Lower Don River, as well as through the consultation process for the CBRA.

3.2.4 Preliminary Vapour Intrusion Considerations

Vapour intrusion refers to the migration of volatile COCs from the subsurface (soil and groundwater) upwards through the unsaturated zone and into the indoor air of enclosed structures above. These volatile COCs can then be inhaled by the occupants of these buildings. Volatile COCs have been identified within the soil and groundwater of the CBRA Area. Consequently, potential human health risks associated with exposures to chemicals via inhalation of vapours that infiltrate the indoor air of existing and future buildings from impacted soil and groundwater, as well as NAPL where relevant, will be assessed in the CBRA. While portions of the CBRA Area (for instance the water lot) may not have enclosures and this pathway may not be relevant for these areas, soil excavated from these areas may be reused in an area where this pathway is relevant. To maximize the potential reuse and consider all possible reuse scenarios, the vapour intrusion pathway will be considered in the CBRA.

As indicated in Figure 3, there are a number of existing buildings within the CBRA Area. Many of these structures are heritage buildings and are planned to remain in the CBRA Area, although some of the structures may be relocated within the CBRA Area and not all of the remaining structures may be occupiable (for example, the silos). An effort will be made to determine site-specific building construction parameters before the development of the CBRA. CH2M understands the likely future use of existing buildings will be commercial space.

The construction of additional future buildings is also anticipated in the CBRA Area. Although no definitive construction plans for specific buildings are as yet available, CH2M understands construction will likely involve mixed commercial/residential low- to high-rise structures. The construction of single-family dwellings is not contemplated for the CBRA Area; therefore, the inclusion of generic residential building assumptions for the modelling of potential vapour intrusion (VI) exposure is not planned for the CBRA. Based on the anticipated revitalization plan, and other revitalization efforts in the City of Toronto, new buildings in the CBRA Areas could involve a footprint that extends from block boundary to block boundary, subgrade parking, and/or main level commercial use below a residential tower. These building scenarios will be considered in the assessment of VI within the CBRA, as relevant.

Indoor air modelling will be used to evaluate the VI pathway. In September 1998, the U.S. Environmental Protection Agency (USEPA) developed a series of models to estimate indoor air concentrations and associated health risks from subsurface vapour intrusion into buildings. These models were based on Johnson and Ettinger's (J&E's) analytical solutions (1991) for contaminant partitioning and subsurface vapour transport into buildings, and were most recently updated in 2004. In the planned CBRA, the J&E Model, Version 3.1 (USEPA, 2004) will be used to develop attenuation factors for existing and potential

future onsite buildings. The presence of contaminated groundwater less than 0.3 m away from a building's foundation precludes the use of the J&E Model for modelling VI. The potential water table elevation post revitilization is still under assessment, and the implications of this limitation will be considered in the CBRA as required. Application of the MOECC's empirically derived attenuation values for residential and commercial/industrial settings, as well as application of the O. Reg. 153/04 Modified Generic Risk Assessment (MGRA) Tier 2 model (MOECC, 2011d), will be considered, where relevant and appropriate.

In addition, the presence of NAPL in the subsurface requires a fourth phase be considered in the application of the J&E Model to assessment the potential for VI. This potential fourth phase will also be considered and included, as needed, in the CBRA. The USEPA (2000) model for assessing VI when NAPL is present will be considered for application in this assessment.

3.2.5 Volatile COCs in Outdoor Air

Volatile COCs from soil, groundwater, and NAPL may also migrate upwards through the unsaturated zone and be released to outdoor air at the ground surface or within a trench excavated during construction activities. These volatile COCs can then be inhaled by people present in the CBRA Area.

Estimation of exposure via the soil/groundwater-to-outdoor-air pathway involves calculating the predicted concentration of COC vapours that result in outdoor air because of the migration of vapours from subsurface soil layers and from groundwater through unsaturated soil into receptors' breathing space. The model described by Sanders and Stern (1994) will be used in the CBRA to calculate the flux or emission rate of each individual COC at the boundary between the surface of the soil and ambient air. To account for the presence of NAPL in the subsurface, where relevant, a fourth phase will be incorporated into the Sanders and Stern model. A box model (United States Environmental Protection Agency [USEPA], 1989) will then be employed as a conservative dispersion model to calculate air concentrations of each predicted COC emission from the soil surface. This model assumes steady-state conditions with instantaneous and complete mixing inside the "box." The box will have a 13-square-metre (m^2) base, bounded at the top by the mixing zone height of 2 metres (m), and hypothetically be ventilated by a steady flow of wind across the box. This box size was established to correspond to that of the atmosphere mixing cell described by MOECC (2011c). This box volume is considered to conservatively simulate the breathing zone for human receptors in outdoor conditions.

For persons involved in excavation activities, exposure to volatiles in outdoor air could additionally involve exposure to volatiles in air within an excavated trench. As such, the "box" could in fact be an excavated trench located within the subsurface. The flux of volatiles from the subsurface into a trench would be expected to be greater than that occurring at the surface because the walls of the trench would provide more surface area from which volatiles could discharge. In addition, the enclosed nature of an excavated trench would lead to decreased air exchange and increased potential exposure to subsurface volatiles via inhalation. To account for this scenario, the wind speed applied to the model will be set to 0.45 m per second, which represents the average wind speed in an excavation over a year's time (USEPA, 1999). Additionally, the surface area from which volatiles could flux will be increased to 69 m^2 to account for the exposed trench walls.

3.2.6 Groundwater to Surface Water Assessment

The groundwater to surface water pathway is a key pathway that will require assessment under projected future conditions, due to substantial changes to grades and subsurface conditions. As previously noted, Lake Ontario currently appears to exhibit a major hydraulic influence on groundwater elevations within the CBRA Area. Under the proposed future condition, groundwater flow regimes are anticipated to be controlled significantly by lake levels, but the construction of the new river valley will create new habitat and increased shoreline for groundwater discharge opportunities from areas of soil

and groundwater known to be contaminated with mobile COCs and potentially mobile NAPL – particularly from lands adjacent to the new water lot.

No standard model exists for the assessment of this pathway, in light of the proposed future conditions. Therefore, the approach to assessing the groundwater to surface water pathway in the CBRA will involve a combination of partitioning modelling, groundwater transport modelling, mixing and dilution effects modelling, and exposure assessment.

Partitioning models coupled with fate and groundwater transport models will be used to assess the impact of this pathway on the new river mouth. The partitioning models will account for the presence of NAPL as a fourth phase within the subsurface, as relevant, as NAPL can act as a source for dissolved COCs in groundwater. It is assumed that direct discharge of NAPL to the surface water will not be permitted (that is, it will be controlled) thus this scenario is not anticipated to be considered in the modelling. COCs loading into the river (based on the best estimate of potential partitioning and discharge from subsurface soils and groundwater) and subsequent dilution will be assessed over typical flow and low flow conditions in the Don River.

Conservative assumptions will first be applied to develop a CSM for dilution under the revitalization scenario. For example, dockwalls and containment structures of Essroc Quay will be assumed to be permeable and not inhibit groundwater discharge. Using statistics to derive a reasonable upper estimate of COC concentrations in groundwater from data collected in the land subareas, segments of shoreline will be defined and transport characteristics from empirical and literature sources will be developed. These will then be used to estimate contaminated groundwater flow and discharge into the future configuration of the naturalized Don River and the lake.

Historical Don River flow data will be assessed to select the best estimate of low-flow conditions (limiting the potential for mixing), as well as other conditions, such as lake level and groundwater level, to assess potential groundwater discharge along the perimeter of the revitalized CBRA land subareas. Shoreline segments may be groups based on geological similarity, hydrogeological similarity, and assumed physical discharge “windows.” Resulting estimates of groundwater volumes discharged to the Don River and lake will be applied for dilution modelling.

Because drift currents and nearshore currents in Toronto Harbour and Lake Ontario are expected to be significantly different from the current likely to be present in the Don River mouth, a multiple-source mixing model (typically employed for environmental permitting) will be used to estimate the long-term contribution from soil and groundwater in lands adjacent to the lake. This modeling approach will be applied as opposed to a dilution model as this modelling predicts long-term concentrations in mixing cells adjacent to the shore using Environmental Canada data on wave and nearshore current actions, and is thus expected to present a reasonable estimate of nearshore conditions

The modelling exercises will predict exposure concentrations in the lake or river, and the final stage of this evaluation will involve assessing the estimated concentrations in the context of MOECC aquatic protection values. As noted, conservative assumptions will first be applied to support this assessment, and those assumptions may then be adjusted as relevant to provide a reasonable assessment of the groundwater to surface water pathway.

3.3 Toxicological Information

Preliminary lists of proposed toxicity data for application in the CBRA have been compiled for both human and ecological receptors. Proposed human toxicity data are included in Table 11-5. Proposed ecological toxicity data for COCs in soil and groundwater are included in Tables 11-6 and 11-7, respectively.

3.4 CBRA Conclusions and Recommendations

The conclusions and recommendations in the CBRA will summarize the CBRA's objectives, approach, assumptions, risk levels, HQs and Intervention Values (IVs) for the COCs for each subarea. The IVs will be presented for each COC and each exposure pathway; the exposure pathways may be grouped based on the exposure zone described in Section 3.2.1. The IVs will be applied to assess the need for RMMs, the need for soil or groundwater treatment and to support soil and sediment reuse within the CBRA Area.

4. CBRA Implementation

The CBRA will be used to guide the excavation, construction and development of the environmental aspects of the flood protection. This includes the construction of the river valley and valley wall, the infill of Essroc Quay, grade land form changes, preservation of heritage structures and realignment of existing infrastructure. The CBRA will provide the tools to evaluate excavated or in place soil and thus determine soil reuse destinations, remediation or RMM requirements. The CBRA will consider groundwater conditions and under the future revitalized setting, the groundwater pathways that need mitigation.

The conclusions and recommendations in the CBRA will result in the development of sets of Intervention Values (IVs) for each subarea. It is the use and interpretation of these IVs that will give the guidance for the excavation, construction and development of the environmental aspects of the flood protection. The IVs will also be applied to assess the need for RMMs, the need for soil or groundwater treatment and to support soil and sediment reuse within the CBRA Area.

Multiple IVs for various media will be developed for each of the subareas for the various types of future receptors. The IVs may also be combined for use in an exposure zone to take into account multiple future receptors applicable to that exposure zone. Consideration of the vertical position of the soil will be important in defining the IV. For instance, flood protection may require the addition of up to 1.5 metres of soil on top of existing soil. IVs will take into account the ultimate position of the soil and groundwater in the subsurface and the significance of that position with respect to potentially completed exposure pathways (for example, existing soil that is to remain at surface, as opposed to existing soil that ultimately is at depth after flood protection). Within each subarea listed below, IVs for each COC will be defined in a manner similar to the example in Table 6.6 of the draft MOECC CBRA Guidance document (MOECC, 2014).

1. The Water Lot
2. Essroc Quay Infill Area
3. Villiers Island
4. Polson Island
5. Land east of the re-naturalized Don River (East Area)

Portions of the CBRA Area are targeted for revitalization to a more sensitive land use (for example, revitalization to parkland from former industrial land use), and will likely require the filing of an RSC in the future. Lands identified for a future RSC will undergo a separate RA process per O. Reg. 153/04 as required outside of the CBRA and required RMMs for those lands are expected to be implemented via a future Certificate of Property Use under O. Reg. 153/04. These potential locations requiring RSCs are shown on Figure 15. It is anticipated, however, that the information, models and scientific basis of the CBRA will help to support the conclusion of the future RAs. It is anticipated that IVs and resulting RMMs would be applicable to the future RAs conducted under the Brownfields regulation.

4.1 Soil and Sediment Reuse

The CBRA will develop IVs for each subarea based on the relevant media, identified receptors, exposure assumptions, and various land uses in each area. A unique characteristic of this CBRA, is the application of the CBRA to direct soil and sediment reuse. Soil from the Water Lot subarea is to be excavated to create the new river valley. Sediment in the Essroc Quay Infill Area may also be excavated prior to infilling. In both cases, the soil or sediment will be assessed based on the CBRA conclusions and either treated, remediated, reused on-site or disposed of off-site.

As noted with respect to the development of EPCs, IVs will be developed with consideration of "exposure zones" based on anticipated site use in each subarea. The exposure zone concept will be applied so that soil can be reused within the CBRA Area in a manner consistent with the CBRA and be

protective of human health and ecological receptors. The exposure zone concept will be particularly useful for soil and sediment reuse. The exposure zones will be zones where the soil or sediment may be applied or applications where the soil or sediment may be considered. Using the COC dataset from the soil and sediment planned for excavation, IVs will be developed for potential exposure zones for soil reuse applications such as the following:

- Upper 0.15 m of soil – relevant for human receptors not engaged in excavation or landscaping activities, as well as and shallow rooted vegetation (e.g., grass)
- Upper 0.5 m of soil – relevant for landscape workers and intermediate rooted vegetation
- Upper 1.5 m of soil – relevant for deep rooted vegetation and excavation workers
- Soil under hard cap surfaces – relevant for excavation workers
- Shallow sediment in water lot – relevant for aquatic vegetation and benthic receptors
- Infill soil in Essroc Quay
- Soil in garden lots (if any) – relevant for human produce consumption
- Soil used in cementitious forms
- Deeper soil below caps – exposure managed by RMM

The soil and sediment IVs for each exposure zone will be applied to direct the reuse of soil and sediment material excavated during the revitalization of the CBRA Area. Concentrations that exceed the IVs will be identified for further risk management or remediation.

4.2 RMMs

RMMs will be incorporated into the revitalization to support the management of COCs in place when risks exceeding acceptable levels cannot be ruled out (that is, IVs are not met in a SubArea for soil or groundwater remaining in place). RMMs may include a combination of engineered controls, administrative controls, and long-term monitoring, maintenance and record-keeping requirements, as summarized in Table 12-1. These RMMs align with those included in the MGRA (MOECC, 2011d). RMMs are established to block exposure pathways or reduce exposures to acceptable levels, or both. In some cases, remediation activities will also be applied to protect site receptors from exposure to COCs.

Currently, typical RMMs as included in the MGRA (MOECC, 2011d) are anticipated for the CBRA Area, although there is potential for some unique RMM features in the water lot (including the wetland potential for COC attenuation) and associated with stabilized structures, heritage buildings, future groundwater discharge to surface water of the water lot, and NAPL in lands outside the water lot. These unique RMMs have not yet been determined, and are expected to be refined during the consultation process outlined in Section 5. The type of RMM commonly referred to as capping to block contact with existing soil or groundwater is anticipated to be formulated from reused soil within the CBRA Area. The approach for determining the quality of the cap ties back to the previous Section 4.1.

Based on the current understanding of conditions across the CBRA Area and the planned construction activities, CH2M understands remedial activities for soil and groundwater impacts will be targeted to the planned water lot area, while other impacts in the planned park and development blocks are expected to be managed in place. However, it is currently assumed that COCs in these areas can be managed in place via the RMMs listed in Table 12-1 and noted in Figures 14A and 14B.

4.3 Soil and Groundwater Management Plans

The implementation of the CBRA will involve the management of soil and groundwater that is further detailed in Soil and Groundwater Management Plans. While the CBRA will develop a series of IVs for each SubArea and Exposure Zone, the SMP and GMP will combine the information into a practice manual for directing and guiding soil reuse and groundwater management in the CBRA Area.

5. Proposed Communication Plan

The CBRA Communication Plan is intended to present a meaningful and effective way to engage and to foster stakeholder participation in the development of the CBRA. The CBRA Communication Plan falls within the overall Don Mouth Naturalization and Port Lands Flood Protection Project (DMNP) Environmental Assessment (EA) Consultation Plan, the full implementation of which will not occur until project funding is secured. The Proposed TOR for the *Consultation Plan for the Port Lands Flood Protection and Enabling Infrastructure Design and Implementation Strategy, EAB file number EA 03 03 02, Version 1* (TRCA, 2015a) has been drafted and describes the context of the TOR as follows:

> *This ToR builds upon the consultation strategies established through two Environmental Assessment Projects. These two EAs are the Don Mouth Naturalization and Port Lands Flood Protection Project Environmental Assessment (DMNP EA) (March 2014) and the Lower Don Lands Master Plan Class Environmental Assessment Addendum and Environmental Study Report (LDL MP EA) (September 2014)). In January 2015, the Ministry of Environmental and Climate Change (MOECC) approved the DMNP EA, with the release of its formal Conditions of Approval. With the approval of the DMNP EA, the LDL Class EA came into effect.*

The principles that guide CBRA consultation activities are consistent with Waterfront Toronto's Public Consultation and Participation Strategy, a copy of which can be found on Waterfront Toronto's website (www.waterfrontoronto.ca), and are also consistent with the guiding principles described in the *Proposed DMNP EA Consultation Plan Terms of Reference* (Waterfront Toronto, 2015; TRCA, 2015a). The identified interested parties and government agencies will coincide with those identified in the overall EA Consultation Plan.

5.1 Objectives

The Communication Plan for the CBRA is a unique subset of the overall communication plan for the DMNP, with the following objectives:

1. Create or increase awareness of the CBRA process.
2. Meet the consultation commitments set forth by the DMNP EA and CBRA MOECC Guidelines.
3. Provide interested parties with opportunities to participate in the consultation process.
4. Determine public expectations for the CBRA and associated site characterization and RMMs.
5. Provide clear, concise information about the CBRA that is easy for the public to understand.
6. Gain additional knowledge of site conditions that may not have been previously identified from local participants.
7. Create opportunities for meaningful two-way exchange of information between the DMNP Project Team (Waterfront Toronto, City of Toronto, Toronto and Region Conservation Authority), their consultants, stakeholders (including core stakeholders such as MOECC, Aquatic Habitat Toronto, and the Ministry of Affordable Housing), government agencies, and consultation participants.
8. Produce an accurate and comprehensive CBRA that reflects feedback and advice.

5.2 CBRA Consultation Mechanisms

Communication for the CBRA is intended to be dynamic and will offer multiple opportunities for stakeholders to provide input into the CBRA. A variety of consultation mechanisms, such as pre-consultation workshops, small group meetings, and public information centres may be used to share

information with the identified stakeholders and to solicit their feedback and advice. Additional tools, such as newsletters and notices, website updates and social media, may also be employed in coordination with the overall communications about the DMNP.

5.3 First Nations Consultation

The DMNP is located within the area of the Toronto Purchase Specific Claim, which was settled between the Government of Canada and the Mississaugas of the New Credit First Nation in 2010. The Mississaugas of the New Credit First Nation were not the only Aboriginal community to reside within the Toronto area. Archaeological evidence indicates that many other Aboriginal communities have occupied the CBRA Area over the centuries. As such, efforts will be made to engage with First Nations. Engagement may include a variety of mechanisms to share information about the CBRA and seek feedback and input.

5.4 Reporting

A Record of Consultation will be maintained to document consultation events, feedback, input, and resulting application of the feedback (if applicable) within the CBRA. As per Conditions 3 and 4 of the MOECC *Conditions of Approval for the DMNP EA (MOECC, 2015)*, the CBRA consultation will be summarized in the Annual DMNP EA Compliance Monitoring Report. The Record of Consultation will also be included in the CBRA final submission.

6. Timelines

The anticipated timing for the completion of the CBRA is as follows:

- **Stakeholder Preconsultation – Spring and Summer 2016:** This phase of the work will involve further refining the preliminary items included in the CBRA TOR following the completion of the data collection activities, the confirmation of the data base, and a refined understanding of site development plans and projected final conditions. This effort is expected to involve the development of a series of technical memoranda targeted at specific technical items that support the development of the CBRA, including the CSM, exposure assumptions, the VI assessment approach, the groundwater to surface water assessment approach, the development of IVs, and so on.
- **Submission of CBRA to MOECC and Stakeholders – Fall 2016:** It is anticipated that the CBRA will be submitted jointly to the MOECC and other stakeholders for review and comment.
- **Revision of CBRA – Winter 2016:** It is expected that comments regarding the CBRA will be received from all parties by winter 2016 and a revised CBRA in response to those comments will commence at that time.
- **Seek Acknowledgement of CBRA – Early Spring 2017:** A second review of the CBRA by MOECC and other stakeholders is expected to occur early 2017, with the potential for acknowledgement on the CBRA occurring by spring 2017.

7. References

Adamas Environmental Inc. (Adamas). 1995a. *Phase III Environmental Site Assessment, 150 Commissioners Street.* Prepared for CP Rail System Properties Group. June.

Adamas Environmental Inc. (Adamas). 1995b. *Supplementary Phase III Environmental Site Assessment, 150 Commissioners Street.* Prepared for CP Rail System Properties Group. August 14.

Angus Environmental Ltd. 1995. *Risk Assessment For The Proposed Redeveloped Form of the Harkow Recycling Facility, 85 Commissioners Street, Toronto, Ontario*. Prepared for Harkow Aggregates and Recycling Limited/the City of Toronto Economic Development Corporation. March.

Canadian Council of Ministers of the Environment (CCME). 2008. *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil, User Guidance*. Prepared by O'Conner Associates Environmental Inc. and Meridian Environmental Inc. January.

CH2M HILL Canada Limited (CH2M). 2005a. *Draft Report, Supplemental Phase II Environmental Site Assessment, 150 Commissioners Street.* Prepared for Borden, Ladner and Gervais LLP. February.

CH2M HILL Canada Limited (CH2M). 2005b*. Draft Report, Supplemental Phase II Environmental Site Assessment, Site 52W - 105 Villiers Street.* Prepared for Borden, Ladner and Gervais LLP. February.

CH2M HILL Canada Limited (CH2M). 2005c. *Draft Report, Supplemental Phase II Environmental Site Assessment, 155 Villiers Street.* Prepared for Borden, Ladner and Gervais LLP. February.

CH2M HILL Canada Limited (CH2M). 2005d. *Draft Report, Supplemental Phase II Environmental Site Assessment, 165 Villiers Street.* Prepared for Borden, Ladner and Gervais LLP. February.

CH2M HILL Canada Limited (CH2M). 2008a. *Final Factual Report, Soil and Groundwater Investigation, 10 Munition Street.* Prepared for Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008b. *Final Factual Report, Soil and Groundwater Investigation, 54 Commissioners Street*. Prepared for the Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008c. *Final Factual Report, Phase II Environmental Site Assessment, 309 Cherry Street Right of Ways, 54 Commissioners Street*. Prepared for the Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008d. *Final Factual Report, Soil and Groundwater Investigation, 281 Cherry Street.* Prepared for Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008e. *Factual Report, Supplemental Phase II Environmental Site Assessment, Site 58 - 150 Commissioners Street.* Prepared for Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008f. *Factual Report, Supplemental Phase II Environmental Site Assessment, Site 52W - 105 Villiers Street*. Prepared for Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008g. *Factual Report, Supplemental Phase II Environmental Site Assessment, Site 52C, 155 Villiers Street.* Prepared for Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2008h. *Final Factual Report, Supplemental Phase II Environmental Site Assessment, Site 52E, 165 Villiers Street*. Prepared for Toronto Waterfront Revitalization Corporation. April.

CH2M HILL Canada Limited (CH2M). 2015. *Stage 1: Draft Preliminary Environmental Assessment and Geotechnical and Earthworks Report.* Port Lands, Toronto. Prepared for Waterfront Toronto. September 30.

Conestoga-Rovers and Associates (CRA). 2011. *Groundwater Monitoring Event – Spring 2011, 75 Commissioners Street, Toronto, Ontario.* Prepared for Toronto Port Lands Company. July 6.

Conestoga-Rovers and Associates (CRA). 2014. P*hase II Environmental Assessment, 312 Cherry Street.* Prepared for Toronto Port Lands Company. April.

Dames and Moore Canada (DMC). 1994. *Baseline Environmental Assessment, 97 Commissioners Street, Toronto, Ontario.* Prepared for Harbour Remediation and Transfer Inc. August 5.

Decommissioning Consulting Services Limited (DCS). 1993. (*Draft) Environmental Site Preparation, Proposed Harkow Facility, 85 Commissioners Street (Site 74)*. Prepared for the City of Toronto Economic Development Corporation. March.

Decommissioning Consulting Services Limited (DCS). 1997. *Site Characterization, Former CP Express Transport Site, Port Industrial Area, Toronto (150 Commissioners and 105-165 Villiers Street).* Prepared for Canadian Pacific Limited and Toronto Economic Development Corporation. April.

Decommissioning Consulting Services Limited (DCS). 1998. *Underground Storage Tank Removals, 150 Commissioners Street.* Prepared for Canadian Pacific Limited. March 1998.

Decommissioning Consulting Services Limited (DCS). 2000. *Pre-lease Commencement Audit, 75 Commissioners Street, Toronto, Ontario.* Prepared for the City of Toronto Economic Development Corporation. December.

Decommissioning Consulting Services Limited (DCS). 2002a. *Commencement Audit, 80 Commissioners Street*. Prepared for the City of Toronto Economic Development Corporation. November.

Decommissioning Consulting Services Limited (DCS). 2002b. *Phase 1 Environmental Site Assessment, 222 Cherry Street.* Prepared for Toronto Economic Development Corporation. October.

Decommissioning Consulting Services Limited (DCS). 2003. *Phase II Environmental Site Assessment, 222 Cherry Street*. Prepared for the City of Toronto Economic Development Corporation. February.

Decommissioning Consulting Services Limited (DCS). 2006. *Site Characterization Update, Former CP Express Transport Site, 150 Commissioners Street and 105 to 165 Villiers Street, Toronto, Ontario.* Prepared for the City of Toronto Economic Development Corporation. November 8.

Decommissioning Consulting Services Limited (DCS). 2007a. *(Draft) Termination Audit, 99 Commissioners Street, Toronto, Ontario*. Prepared for the City of Toronto Economic Development Corporation. February.

Decommissioning Consulting Services Limited (DCS). 2007b. *Supplementary Soil Investigation, 99 Commissioners Street, Toronto, Ontario.* Prepared for the City of Toronto Economic Development Corporation. May 11.

Decommissioning Consulting Services Limited (DCS). 2009. *Environmental Subsurface Characterization, PortLands Sports Complex, 85, 85, 99, 9A Commissioners Street, Toronto, Ontario*. Prepared for the City of Toronto Economic Development Corporation. November 9.

Decommissioning Consulting Services Limited (DCS). 2014. *Area-Wide Initiative Groundwater Monitoring and Sampling Results – 2013*. Prepared for Toronto Port Lands Company. June.

GHD Limited (GHD). 2015. *Port Lands Environmental, Geotechnical, and Hydrogeological Investigation, Port Lands, Toronto, Ontario. Report No. 2., Draft for Review*. Prepared for Waterfront Toronto. September 15.

Golder Associates Ltd. (Golder). 1991. *Preliminary Environmental Site Assessment, Quebec and Ontario Paper Company, Toronto Recycling Centre, Toronto, Ontario*. Prepared for Blake, Cassels and Graydon. May.

Golder Associates (Golder). 1992a. Phase I Environmental Site Assessment, 150 Commissioners Street. Prepared for CP Express and Transport (CPET). July 1, 1992.

Golder Associates (Golder). 1992b. *Phase II Environmental Site Assessment, 150 Commissioners Street.* Prepared for CP Express and Transport (CPET). July 1

Golder Associates Limited (Golder). 2012. *Draft- Limited Environmental Testing and Hazardous Materials Survey, 281 Cherry Street.* Prepared for Toronto Port Lands Company. August 31.

Golder Associates Limited (Golder). 2013. *Phase I Environmental Site Assessment, 312 Cherry Street*. Prepared for Essroc Italcementi Group. November 1.

Golder Associates Limited (Golder). 2014a. *Final Report: Phase One Environmental Site Assessment, 54 Commissioners Street, Toronto, Ontario*. Prepared for Waterfront Toronto. November 6.

Golder Associates Limited (Golder). 2014b. *Report: Phase Two Environmental Site Assessment, 54 Commissioners Street, Toronto, Ontario*. Prepared for Waterfront Toronto. November 6.

Golder Associates Limited (Golder). 2014c. *Final Report: Phase One Environmental Site Assessment, 130 Commissioners Street, Toronto, Ontario*. Prepared for Waterfront Toronto. November 18.

Golder Associates Limited (Golder). 2014d. *Final Report: Phase Two Environmental Site Assessment, 130 Commissioners Street, Toronto, Ontario*. Prepared for Waterfront Toronto. November 20.

Health Canada (HC). 2010. *Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA), Version 2.0*. Contaminated Sites Division, Safe Environments Directorate, Health Canada, Ottawa. September. Revised 2012.

Helsel DR (2005). Nondetects and Data Analysis. New York: John Wiley & Sons.

Jacques Whitford Stantec Limited (JWSL). 2009. *Biopile Soil Sampling Summary Report, Villiers Street Biopile Area.* Prepared for the City of Toronto Economic Development Corporation. June 3.

Johnson, P.C., and R.A. Ettinger (J&E). 1991. "Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings." *Environmental Science and Technology*. 25(8): 1445-1452.

Occupational Hygiene and Environment (OHE). 2011. *Phase II Environmental Site Assessment, 281 Cherry Street*. Prepared for Toronto Hydro-Electric System Limited. April.

Ontario Ministry of Environment and Climate Change (MOECC). 1999. *Ontario Typical Range of Chemical Parameters in Soil, Vegetation, Moss Bags and Snow.* As the "Ministry of the Environment and Energy". December 1993 (revised).

Ontario Ministry of the Environment and Climate Change (MOECC). 2005. *Procedures for the Use of Risk Assessment under Part XV.1 of the Environmental Protection Act*. PIBs 5404e. October.

Ontario Ministry of the Environment and Climate Change (MOECC). 2011a. "Records of Site Condition — Part XV.1 of the Act." *Environmental Protection Act*. Ontario Regulation (O. Reg.) 153/04, as amended.

Ontario Ministry of the Environment and Climate Change (MOECC). 2011b. *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*. April 15.

Ontario Ministry of the Environment and Climate Change (MOECC). 2011c. *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario.* April 15, 2011.

Ontario Ministry of the Environment and Climate Change (MOECC). 2011d. "Modified Generic Risk Assessment Model." Excel Spreadsheet. April 15.

Ontario Ministry of the Environment and Climate Change (MOECC). 2014. *Draft for Discussion, Guidance for Conducting Community Based Risk Assessments (CBRAs).* August, 2014.

Ontario Ministry of the Environment and Climate Change (MOECC). 2015. *Section 9 Notice of Approval to Proceed with the Undertaking, Re. An environmental assessment for Don Mouth Naturalization and Port Lands Flood Protection Project, EA 03 03 02*. January 28, 2015.

Proctor and Redfern Limited (P&R). 1992. *Environmental Investigation, 85 Commissioners Street, Toronto, Ontario*. Prepared for Toronto Harbour Commissioners. March 27.

Sanders, P.F. and A.H. Stern. 1994. Calculation of soil cleanup criteria for carcinogenic volatile organic compounds as controlled by the soil-to-indoor air exposure pathway. *Environmental Toxicology and Chemistry*, 13(8): 1367-1373.

Shacklette, H. and J. Boerngen. 1984. *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States*. United States Geological Survey Professional Paper 1270. United States Government Printing Office, Washington.

Shaheen & Peaker Limited (SPL). 1997. *Limited Environmental Investigation, 20 Polson Street, Toronto Ontario.* Prepared for United Castan Corporation. September 8.

Sciscione, Thomas/Coordinator, Aquatic Habitat Toronto, Toronto and Region Conservation Authority, personal communication to X, role/company. 2015.

SPL Consultants Limited (SPL). 2013. *Quality Control/Quality Assurance Report – Imported Shale: 101 Commissioners Street and 1 & 17 Basin Street, Toronto, Ontario*. Prepared for Toronto Waterfront Studios Development Inc. September 9.

Stantec Consulting Ltd. (Stantec). 2013. *2013 Soil Biopile Sampling Summary Report, Villiers Street Biopile Area*. Prepared for Toronto Port Lands Company. July 5.

SLR Consulting Canada Ltd. (SLR). 2009. *Subsurface Investigation in Support of the EA for the DMN and Port Lands Flood Protection Project.* Prepared for the Toronto and Region Conservation Authority. October 5.

Terrapex Environmental Ltd. (Terrapex). 2009. *Phase I Environmental Site Assessment, Preliminary Draft Report, 85-95 Commissioners Street, Toronto, Ontario*. Prepared for Toronto Port Lands Company, December 22.

Toronto and Region Conservation Authority. 2015a. Proposed *Don Mouth Naturalization and Port Lands Flood Protection Project (DMNP) Environmental Assessment (EA) Consultation Plan Terms of Reference.* Version 1. December 16, 2015.

United States Environmental Protection Agency (USEPA). 1989. *Risk Assessment Guidance for Superfund*. EPA/540/01. Washington, DC: USEPA.

United States Environmental Protection Agency (USEPA). 1999. *Derivation of a Volatilization Factor to Estimate Upper Bound Exposure Point Concentration for Workers in Trenches Flooded with Groundwater Off-gassing Volatile Organic Chemicals*. Region 8. REF: 8EPR-PS. July 29.

United States Environmental Protection Agency (USEPA). 2000. *User's Guide for the NAPL-SCREEN and NAPL-ADV Models for Subsurface Vapor Intrusion into Buildings*. Office of Emergency and Remedial Response, Washington, D.C. December.

U.S. Environmental Protection Agency (USEPA). 2004. *User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings*. Washington, DC: Office of Emergency and Remedial Response. February 22.

United States Environmental Protection Agency (USEPA). 2013. ProUCL Version 5.0.00 Technical Guide Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations EPA/600/R-07/041 September 2013 www.epa.gov

Waterfront Toronto. 2015. *Waterfront Revitalization Corporation Public Consultation and Participation Strategy*. www.towaterfront.ca. Accessed January 6, 2016.

Tables

Table 2-1. Potentially Contaminating Activities within the CBRA Area

Port Lands, Toronto, ON

Potentially Contaminating Activity (PCA)[a]	PCA Unique ID	Descriptions of PCAs	Location of PCA[b]		Contaminants of Potential Concern (based on AP method groups[c])	Media Potentially Impacted (groundwater and/or soil)	PCA Results in APEC	Resulting APEC	Rationale	Information Source	HER Reference (as applicable)	FIP Reference (as applicable)
28 - Gasoline and Associated Products Storage in Fixed Tanks	1	AST - A fuel oil AST was located within the warehouse building at 54 Commissioners Street. Golder (2014) observed that the AST did not have secondary containment and that localized staining of the floor was observed in the vicinity of the AST.	54 Commissioners Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-001	PCA within Study Area	HER	CH2M, 2007; Golder, 2014	-
32 - Iron and Steel Manufacturing and Processing 33 - Metal Treatment, Coating, Plating and Finishing 34 - Metal Fabrication	2	Former Foundry and Former Steel Machine Shop - A former foundry was reported to have been located on 309 Cherry Street from 1912 to 1917, and a former steel machine shop from 1928 to 1935. Heavy metals found in soils from previous investigations.	309 Cherry Street	Onsite	VOCs, PAHs, PHCs, complete metals and inorganics, phenols (ABNs) (if foundry sand)	Soil and Groundwater	YES	APEC-002	PCA within Study Area	HER	SLR, 2009	-
32 - Iron and Steel Manufacturing and Processing 33 - Metal Treatment, Coating, Plating and Finishing 34 - Metal Fabrication	3	Machine Shop and Foundry - The Queen's Foundry and later the Bond Engineering Works operated at 16 Munition Street from approximately 1917 to the 1970s. Historical reports indicate metal exceedances to 1.0 mbgs.	10 to 16 Munition Street	Onsite	VOCs, PAHs, PHCs, complete metals and inorganics, phenols (ABNs) (if foundry sand)	Soil and Groundwater	YES	APEC-003	PCA within Study Area	HER	CH2M, 2007; Golder, 2014	-
32 - Iron and Steel Manufacturing and Processing 34 - Metal Fabrication	4	Former Steel Fabrication, Metal Working and Shop - Structural Steel Fabrication (1920s to 1950s) and Metal Working and Shop Repair (1960s to 1980s). Impacts reported from historical reports to a depth of 1.5 mbgs (PHCs, PAHs, EC).	80 Commissioners Street	Onsite	Metals, PAHs, phenols (ABNs) (if foundry sand)	Soil and Groundwater	YES	APEC-004	PCA within Study Area	HER	CH2M, 2007; DCS, 2002b	-
32 - Iron and Steel Manufacturing and Processing 34 - Metal Fabrication	5	Former Steel Plant - British Forgings/Baldwin Steel Plant operated at this property from approximately 1914 to 1928.	21-51 and 63, 75, 85, 95, 99, 99a Commissioners Street, 181 to 185 Cherry Street	Onsite	Metals, PAHs, phenols (ABNs) (if foundry sand)	Soil and Groundwater	YES	APEC-005	PCA within Study Area	HER	CH2M, 2007; SLR, 2009	-
NA	6	Former Coal Storage - McColl Bros. Ltd./McColl Frontenac/Texaco developed land on the east side of Cherry Street and used 222 Cherry Street for coal storage (late 1940s to early 1950s).	222 Cherry Street	Onsite	Metals, PAHs	Soil and Groundwater	YES	APEC-006	PCA within Study Area	HER	DCS, 2002	-
55- Transformer Manufacturing, Processing and Use	7	Former Transformer Use - Presence of a row of four transformers shown on a 1973 FIP along the exterior of the east building wall.	222 Cherry Street	Onsite	PHCs, PCBs, VOCs	Soil and Groundwater	YES	APEC-007	PCA within Study Area	HER	DCS, 2002	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	8	Former UST - Presence of a UST shown on a 1973 FIP at the extreme southwestern corner of the building, located beneath the loading dock extension.	222 Cherry Street	Onsite	PHCs, VOCs, metals	Soil and Groundwater	YES	APEC-008	PCA within Study Area	HER	DCS, 2002	-
NA	9	Salt Usage - Site was used as a grocery store from 1973 to 2000 with a large portion of the Site dedicated to parking where salt application for de-icing was conducted.	222 Cherry Street	Onsite	Inorganics (EC, SAR)	Soil and Groundwater	YES	APEC-009	PCA within Study Area	HER	DCS, 2002	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	10	Fuel Oil Spill - EcoLog ERIS reports a fuel oil spill of unknown quantity from a UST located at 54 Polson Street in April 1993.	54 Polson Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-010	PCA within Study Area	HER	DCS, 2002	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	11	Oil Spill - EcoLog ERIS reports a catch basin at 63 Polson Street which was overflowing with oil and migrated to Polson Street in May 2000.	63 Polson Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-011	PCA within Study Area	HER	DCS, 2002	-
12 - Concrete, Cement and Lime Manufacturing	12	Cement Plant - Based on City Directories, Canada Cement Company/LaFarge Canada has operated at 54 Polsen Street (formerly Carton Street) since the early 1940s.	54 Polson Street	Onsite	pH	Soil and Groundwater	YES	APEC-012	PCA within Study Area	HER	DCS, 2002	-
NA	13	Former Coal Storage - City Directories list various coal companies at 190 Cherry Street between 1940 and 1951.	190 Cherry Street	Onsite	Metals, PAHs	Soil and Groundwater	YES	APEC-013	PCA within Study Area	HER	DCS, 2002	-
NA	14	Former Coal Storage - 1953 FIP shows coal stockpiled on the western half of 20 Polson Street (Toronto Fuels Ltd.).	20 Polson Street	Onsite	Metals, PAHs	Soil and Groundwater	YES	APEC-014	PCA within Study Area	HER	DCS, 2002	-
NA	15	Former Coal Storage - 1951 FIP shows coal stockpiles across 176 Cherry Street (Toronto Fuels Ltd. and Ontario Dock & Forwarding Co. Ltd).	176 Cherry Street	Onsite	Metals, PAHs	Soil and Groundwater	YES	APEC-015	PCA within Study Area	HER	DCS, 2002	-
30 - Importation of Fill Material of Unknown Quality	16	Imported Fill - Borehole logs for 20 Polson Street indicate the presence of fill materials .	20 Polson Street	Onsite	Metals/inorganics, PAHs, PHCs	Soil and Groundwater	YES	APEC-016	PCA within Study Area	HER	SPL, 1997	-
30 - Importation of Fill Material of Unknown Quality	17	Imported Fill - Borehole logs for 222 Cherry Street indicate the presence of fill materials.	222 Cherry Street	Onsite	Metals/inorganics, PAHs, PHCs	Soil and Groundwater	YES	APEC-017	PCA within Study Area	HER	DCS, 2003	-
46 - Rail Yards, Tracks and Spurs	18	Former Rail Spurs - 1973 and 1976 FIPs shows a rail spur entering 222 Cherry Street in the northwestern corner and running the length of the western property boundary to the southern wall of the building; 1976 FIP shows a rail spur entering 20 Polson Street from the centre of the eastern property boundary and running through the centre of the property before terminating on Polson Street near the southwestern corner of the property; 1951, 1973, and 1976 FIPs shows rail spurs entering the 176 Cherry Street near the northeastern corner of the property. One set runs through to the centre of the property, while another creates a large oval and links back to the northeastern corner. 1951, 1973, and 1976 FIPs shows rail spurs running in a east-west direction along almost the entire length of Polson Street, terminating at Lake Ontario. 1951, 1973 and 1976 FIPs shows rail spurs entering 54 Polson Street in the northeastern corner with one spur running towards the southern boundary (1951 only) and additional spurs running through the centre of the property terminating near the western property boundary.	176, 222 Cherry Street; 1-63 Polson Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-018	PCA within Study Area	HER	DCS, 2002	-
55- Transformer Manufacturing, Processing and Use	19	Former Transformer Use - 1973 FIP shows a transformer located on the south side of a cluster of four concrete silos on 54 Polson Street, adjacent to Polson Street.	54 Polson Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-019	PCA within Study Area	HER	DCS, 2002	-
32 - Iron and Steel Manufacturing and Processing 34 - Metal Fabrication 49 - Salvage Yard, including automobile wrecking	20	Scrap Metal Handling/Fabrication - 1973 FIP shows a scrap metal yard. City Directories list Warehouse Metals/Industrial Metal Co. of Canada between the years 1961 and 1982.	176 Cherry Street	Onsite	PCBs, VOCs, PAHs, PHCs, metals, phenols (ABNs) (if foundry sand)	Soil and Groundwater	YES	APEC-020	PCA within Study Area	HER	DCS, 2002	-
34 - Metal Fabrication	21	Former Can Company - 1976 FIP shows the Continental Can Company of Canada Limited located on the south side of Polson Street.	1 - 63 Polson Street	Onsite	Metals	Soil and Groundwater	YES	APEC-021	PCA within Study Area	HER	DCS, 2002	-
45 - Pulp, Paper and Paperboard Manufacturing and Processing	22	Former Paperboard Manufacturing - 1935 and 1951 FIPs show Dominion Boxboards Limited (1935) and Gair Co. Canada Limited (1951) located on the south side of Polson Street.	1 - 63 Polson Street	Onsite	Metals/inorganics	Soil and Groundwater	YES	APEC-022	PCA within Study Area	HER	DCS, 2002	-
11 - Commercial Trucking and Container Terminals 28 - Gasoline and Associated Products Storage in Fixed Tanks	23	Vehicle Storage Area - Golder (2013) indicates that the western portion of 312 Cherry Street was historically used for intermittent storage of vehicles and tractor trailers (1970s to 1990s). An AST was reportedly used for refuelling activities.	312 Cherry Street	Onsite	PHCs, BTEX, PAHs, metals (lead)	Soil and Groundwater	YES	APEC-023	PCA within Study Area	HER	Golder, 2013	-
46 - Rail Yards, Tracks and Spurs	24	Former Rail Spurs - Golder (2013) indicates that a railway line was located to the east of 312 Cherry Street and that spurs extended onto the property.	312 Cherry Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-024	PCA within Study Area	HER	Golder, 2013	-
55- Transformer Manufacturing, Processing and Use	25	Transformer Use - Golder (2013) reports the presence of a pad-mounted transformer (1,817 L) located north of the office building at 312 Cherry Street. A 2004 inspection report reviewed by Golder indicated the transformer oil PCB concentration is approximately 27 ppm.	312 Cherry Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-025	PCA within Study Area	HER	Golder, 2013	-
44 - Port Activities, including Operation and Maintenance of Wharves and Docks	26	Ship Docking Areas - Golder (2013) reports that docking areas on the north, west, and south sides of 312 Cherry Street may have been used by Century Coal for the storage and transfer of coal. SLR (2009) reports that the property was used as a foundry yard and ship dockage from 1912 to 1917.	312 Cherry Street	Onsite	PHCs, metals, PAHs, phenols (ABNs) (if foundry sand)	Soil and Groundwater	YES	APEC-026	PCA within Study Area	HER	Golder, 2013; SLR, 2009	-
46 - Rail Yards, Tracks and Spurs	27	Former Rail Spurs - ran from the west between Villiers and Commissioners Streets to the northeast corner of 165 Villiers (Golder, 1992a). The property at 10 Munition Street has been historically used for a railway right of way to access 309 Cherry Street (CH2M, 2008b). FIPs from 1935 and 1951 show a rail spur entering the property at 16 Munition Street from the north and running along the west side of the building (Golder, 2013). 1935 FIP shows a rail spur entering 54 Commissioners along the centre of the northern property boundary and terminating at the rear of the building; 1935 FIP shows a rail spur entering 54 Commissioners along the centre of the northern property boundary and terminating at the rear of the building(Golder, 2013; Golder, 2014). FIPs from 1935 and 1951 show a rail spur entering the property at 2 Villiers Street from the southeast corner (Golder, 2013).	Between Commissioners and Villiers Streets	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-027	PCA within Study Area	HER	Golder, 1992a	-
28 - Gasoline and Associated Products Storage in Fixed Tanks 51 - Solvent Manufacturing, Processing and Bulk Storage 58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	28	Solvent Recovery Operations - Anachemicia Chemicals, a solvent recovery company, had an oil fired boiler house, and four storage tanks located between the rail spurs on 165 Villiers Street. Waste products were received in 45 gallon drums and typically included mineral spirits, Shellsol and Varsol.	165 Villiers Street	Onsite	VOCs, PHCs, PAHs, PCBs, metals	Soil and Groundwater	YES	APEC-028	PCA within Study Area	HER	Golder, 1992a	-
NA	29	Grease Building - an "open grease building" was indicated along the rail spur on a 1955 site plan for Fielding Chemicals Limited. The DCS report (2006a) indicated that a previous Golder report noted the building to be present from 1954 to 1966.	150 Commissioners / along Rail Spur	Onsite	VOCs, BTEX, PHCs	Soil and Groundwater	YES	APEC-029	PCA within Study Area	HER	Golder, 1992a	-

Table 2-1. Potentially Contaminating Activities within the CBRA Area
Port Lands, Toronto, ON

Potentially Contaminating Activity (PCA)[a]	PCA Unique ID	Descriptions of PCAs	Location of PCA[b]		Contaminants of Potential Concern (based on AP method groups[c])	Media Potentially Impacted (groundwater and/or soil)	PCA Results in APEC	Resulting APEC	Rationale	Information Source	HER Reference (as applicable)	FIP Reference (as applicable)
NA	30	Former Coal Storage - Anthracite Briquette Company manufactured coal briquettes on 150 Commissioners Street beginning in 1919, and a coal shed was indicated on the southern portion of the property.	150 Commissioners	Onsite	PAHs, metals	Soil and Groundwater	YES	APEC-030	PCA within Study Area	HER	Golder, 1992a	-
30 - Importation of Fill Material of Unknown Quality	31	Imported Fill - Land reclamation occurred in the area in approximately 1913 to 1917. Material was dredged from the east end of the Toronto Harbour into the Ashbridges Bay area.	Study Area south of Keating Channel	Onsite	Metals/inorganics, PAHs, PHCs	Soil and Groundwater	YES	APEC-031	PCA within Study Area	HER	Golder, 1992a	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	32	Potential USTs - Two diesel USTs located east of the former building on 105 Villiers street identified in the Phase II ESA by Golder (1992). An area of 1,200 cubic meters was estimated to be impacted. The diesel tanks were removed from the site in November 1996. Strong odours were present in the soils surrounding the tanks but no evidence of visible product and no soils were removed. Verification samples (6) were below Table B industrial/commercial criteria.	105 Villiers	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-032	PCA within Study Area	HER	Golder, 1992b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	33	Potential USTs and AST - Four USTs were identified: two gasoline USTs in the west end of the 105 Villiers courtyard, and two fuel oil USTs on the east side of the 105 Villiers building (one within the building footprint and one just outside). The UST outside the east side had an estimated capacity of 250 gallon, the other UST sizes are unknown. One fuel oil AST was identified in the southeast corner of the 105 Villiers courtyard; size of the tank is 1000 gallons. Investigations conducted by Adamas and DCS have indicated the soil in the area of these tanks have been impacted with PHCs and BTEX due to filling operations and/or leaks from tanks. Geophysical surveys conducted by DCS (1997) could not confirm the presence of the USTs in the west end of the courtyard. The two USTs on the east side of 105 Villiers building were removed in December 1996. No evidence of grossly contaminated soils were observed; verification soil samples (9) were below Table B industrial/commercial criteria and the excavation was backfilled.	105 Villiers	Onsite	PHCs, BTEX, metals (lead)	Soil and Groundwater	YES	APEC-033	PCA within Study Area	HER	Adamas, 1995	-
7 - Boat Manufacturing	34	Ship Repairs - Two ship repair companies listed in City Directories for the years 1960 to 1976. DCS (2002b) indicated that these operations were conducted out of the buildings located on the southern property boundary of 80 Commissioners Street.	80 Commissioners Street	Onsite	Metals, PHCs, VOCs	Soil and Groundwater	YES	APEC-034	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	35	UST - An unused UST was located north of the building located in the southwestern corner of 80 Commissioners Street. DSC (2002b) measured product within the tank and estimated it's capacity as less than 4,500-L.	80 Commissioners Street	Onsite	PHCs, VOCs, metals (lead)	Soil and Groundwater	YES	APEC-035	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	36	Potential USTs, Oil/Water Separator - three potential fuel oil USTs were identified on the east side of the building at 105 Villiers Street; two USTs were 240 gallons and the third was 2000 gallons. Geophysical surveys conducted by DCS (1997) could not confirm the presence of these USTs, and investigations uncovered an oil water separator in the vicinity. The oil/water separator was removed November 1996, and a small amount of grossly contaminated soils were excavated (no volume indicated). 5 Verification samples were below Table B industrial/commercial criteria and the excavation was backfilled.	105 Villiers	Onsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-036	PCA within Study Area	HER	Adamas, 1995	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	37	Former UST - a 2000 gallon fuel oil UST was identified on the west side of the building at 155 Villiers Street; the UST was removed in December 1996 and the tank was noted to be rusted with perforations. Free product was observed on the groundwater infiltrating into the excavation, and grossly contaminated soil was excavated for disposal (volume not indicated). An extraction well was installed in June 1997.	155 Villiers Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-037	PCA within Study Area	HER	Adamas, 1995	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	38	Former UST - a 2000 gallon fuel oil UST was identified on the north side of the building at 150 Commissioners Street; the UST was removed in November 1996 and the tank was noted to be rusted with perforations. No evidence of grossly contaminated soils were observed; verification soil samples (3) were below Table B industrial/commercial criteria and the excavation was backfilled.	150 Commissioners	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-038	PCA within Study Area	HER	Adamas, 1995	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	39	Former UST - a 1000 gallon "dirty Varsol" UST was reported located on the north end of the building at 155 Villiers Street. The UST was removed in November 1996 and very strong solvent odours were present in the soils surrounding the tank including a visible sheen. The sidewalls of the excavation were advanced until the sheen was no longer observed. An approximate 80 m^2 area was excavated to a depth ranging from 2.5 to 2.7 mbgs. Seven verification soil samples were collected, two samples (on the north and west wall at 1.5 mbgs) indicated xylene concentrations above Table B industrial/commercial criteria with concentrations of 150 ppm and 128 ppm.	155 Villiers Street	Onsite	BTEX, PHCs, VOCs	Soil and Groundwater	YES	APEC-039	PCA within Study Area	HER	Adamas, 1995	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	40	Potential USTs - one fuel oil UST was identified within the building footprint at 155 Villiers, size of tank is unknown, Geophysical surveys conducted by DCS (1997) were not able to confirm the location/presence.	155 Villiers Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-040	PCA within Study Area	HER	Adamas, 1995	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	41	Former AST - two fuel oil ASTs were identified south of the building at 155 Villiers Street. Tanks had a capacity of 500 gallons.	155 Villiers Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-041	PCA within Study Area	HER	Adamas, 1995	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	42	Former UST - a 1000 gallon fuel oil UST was removed in November 1996. No grossly contaminated soils were observed; verification soil samples (4) were below Table B industrial/commercial criteria and the excavation was backfilled.	165 Villiers Street	Onsite	BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-042	PCA within Study Area	HER	Adamas, 1995	-
NA	43	Chemical Storage - Fielding & Sons (Later Fielding Chemicals Limited - Naval Stores and Heavy Chemicals) were brokers and dealers of a variety of products including spirits of turpentine and glues to soap powder and poultry netting. They occupied the property at 165 Villiers from approximately 1919 to approximately 1964.	165 Villiers Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-043	PCA within Study Area	HER	Adamas, 1995	-
NA	44	Smith Transport Warehousing - The Adamas report indicated the building on 150 Commissioners to be used for offices and sheds to support the transport business from 1935, but added warehousing in 1939 on the eastern end.	105 Villiers	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-044	PCA within Study Area	HER	Adamas, 1995	-
NA	45	Smith Transport Trailer Repair Shop - Smith Transport was a transport business; the building on the 155-165 Villiers property was built sometime after 1964 for the repair of trailers.	155-165 Villiers Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-045	PCA within Study Area	HER	Adamas, 1995	-
NA	46	Smith Transport Warehousing - The Adamas report indicated the building on 150 Commissioners to be used for warehousing. Smith Transport occupied this site from approximately 1949, and initially used it for temporary truck parking.	150 Commissioners	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-046	PCA within Study Area	HER	Adamas, 1995	-
18 - Electricity Generation, Transformation and Power Stations	47	Electrical Substation - Toronto Hydro operated an electrical substation at 281 Cherry Street from the 1920s to approximately 1995.	281 Cherry Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-047	PCA within Study Area	HER	OHE, 2011; CH2M, 2008	-
55 - Transformer Manufacturing, Processing and Use	48	Former Transformer Use - CH2M (2008) and OHE (2011) reports that up to two transformers were formerly located in the southeast corner of the building at 281 Cherry Street.	281 Cherry Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-048	PCA within Study Area	HER	OHE, 2011; CH2M, 2008	-
34 - Metal Fabrication	49	Commercial Refrigeration Manufacturer - Commercial refrigeration equipment has been manufactured, serviced, or both at 65 Villiers Street, from approximately the 1920s to the present. FIPs from 1935 and 1951 show coal storage, a garage, a woodworking building, and a welding room.	65 to 95 Villiers Street	Onsite	metals, PHCs, VOCs, PAHs	Soil and Groundwater	YES	APEC-049	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	50	UST - DCS (2002b) reports the presence of an oil UST within the main building at 65 Villiers Street based on information received from the TSSA.	65 to 95 Villiers Street	Onsite	PHCs, PAHs, BTEX	Soil and Groundwater	YES	APEC-050	PCA within Study Area	HER	DCS, 2002b	-
44 - Port Activities, including Operation and Maintenance of Wharves and Docks	51	Port Uses - City Directories indicate that 62 Villiers Street has been used by the Toronto Harbour Commissioners from at least the late 1920s for port uses. Use of this property as a Dry Dock was listed in the City Directories for 1927 only (the first year available for review).	62 Villiers Street	Onsite	PHCs, VOCs, metals, PAHs	Soil and Groundwater	YES	APEC-051	PCA within Study Area	HER	Golder, 2013	-
NA	52	Former Coal Storage - Based on City Directories and FIPs, Milnes Coal Co. operated from 2 Villiers Street from at least 1927 to 1935.	2 Villiers Street	Onsite	PAHs, Metals	Soil and Groundwater	YES	APEC-052	PCA within Study Area	HER	Golder, 2013	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	53	Former Gas Station - EcoLog ERIS reports the presence of a British American Oil Co. Ltd. service station located at 309 Cherry Street which had one 1,514-L gasoline UST and three 3,785-L gasoline USTs in 1934.	309 Cherry Street	Onsite	PHCs, BTEX, metals (lead)	Soil and Groundwater	YES	APEC-053	PCA within Study Area	HER	Golder, 2014	-
28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	54	Former Bulk Fuel Storage - McColl Bros./McColl Frontenac Oil Co. Ltd. at 309 Cherry Street is listed in EcoLog ERIS to have been a petroleum bulk storage site with tanks containing several hundred thousand litres of petroleum and crude oils for the years 1925 and 1930. Bulk fuel storage was conducted at the property from approximately 1938 to the 1990s. SLR (2014) reports that a 1987 Golder report indicates the presence of PHC contaminated at the property to a depth of 4 mbgs. Floating product ranging in thickness between 0.15 and 0.7 m was historically found in monitoring wells located in the centre of the property.	309 Cherry Street	Onsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-054	PCA within Study Area	HER	Golder, 2014; SLR, 2009	-

Table 2-1. Potentially Contaminating Activities within the CBRA Area
Port Lands, Toronto, ON

Potentially Contaminating Activity (PCA)[a]	PCA Unique ID	Descriptions of PCAs	Location of PCA[b]		Contaminants of Potential Concern (based on AP method groups[c])	Media Potentially Impacted (groundwater and/or soil)	PCA Results in APEC	Resulting APEC	Rationale	Information Source	HER Reference (as applicable)	FIP Reference (as applicable)
16 - Crude Oil Refining, Processing and Bulk Storage	55	Former Oil Recycling - AquaTech Blue Ltd. operated an oil recycling facility at 309 Cherry Street. The company was fined over $700,000 in August, 2000 for allowing the discharge of PHCs from this property to the Keating Channel. EcoLog ERIS reports that this property has PCB-containing equipment and stores PCBs (1999 and 2000). EcoLog ERIS reports several spills and explosive vapour readings in storm sewers between the years 1994 to 1999, which are associated with AquaTech Blue's use of the property.	309 Cherry Street	Onsite	PHC, BTEX, PAHs, PCBs, VOCs, metals/inorganics	Soil and Groundwater	YES	APEC-055	PCA within Study Area	HER	Golder, 2014	-
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	56	Waste Processing - Quantex Technologies has operated a waste transfer/processing facility at 309 Cherry Street from approximately 1999 to the present. EcoLog ERIS reports several spills for years between 2000 and 2011, which are associated with Quantex's use of the property.	309 Cherry Street	Onsite	PHC, BTEX, PAHs, PCBs, VOCs, metals/inorganics, OC pesticides	Soil and Groundwater	YES	APEC-056	PCA within Study Area	HER	Golder, 2014	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	57	USTs - EcoLog ERIS reports that the Toronto Port Authority operated a private fuel outlet at 62 Villiers Street between 2007 and 2011. The property is listed as having two USTs, one for gasoline and one for diesel (4,500 L each), both installed in 1989.	62 Villiers Street	Onsite	PHCs, BTEX, metals (lead)	Soil and Groundwater	YES	APEC-057	PCA within Study Area	HER	Golder, 2014	-
16 - Crude Oil Refining, Processing and Bulk Storage	58	Oil Storage - SLR (2009) reports that 2 Villiers Street was used for oil storage from approximately 1940 to 1950.	2 Villiers Street	Onsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-058	PCA within Study Area	HER	SLR, 2009	-
9 - Coal Gasification	59	Coal Gasification Plant - The Consumers Gas Company appears on FIPs from 1913 and 1924, and aerial photographs from 1947 at the southwestern corner of Eastern and Booth Avenues.	Southwestern corner of Eastern and Booth Avenues	Onsite/ Offsite	PHCs, BTEX, PAHs, VOCs, metals	Soil and Groundwater	YES	APEC-059	PCA within Study Area	FIP	-	1913, 1924
28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	60	Bulk Tank Farm - 1913 and 1924 FIP show a bulk tank farm on the north side of the Keating Channel on the east side of Cherry Street. The company name is not labelled in 1913, but is listed as the British North American Oil Company in the 1924 FIP. The structures/tanks associated with this property extend east to the Don River on the 1924 FIP. The tank farm, extending west from Cherry Street, south to the Keating Channel, north to the railway lines, and east to the Don River, is visible on aerial photographs until 1971. A 1983 aerial shows that all of the large ASTs have been removed from this property.	Northeastern corner of Cherry Street and Keating Channel, west to Don River	Onsite/ Offsite	PHCs, VOCs, PAHs, metals	Soil and Groundwater	YES	APEC-060	PCA within Study Area	FIP	-	1913
46 - Rail Yards, Tracks and Spurs	61	Railway Main Lines/Yard - Grand Trunk Railway lines are shown on the 1913 and 1924 FIPs. These railway lines are still in place based on current aerial mapping.	North of Keating Channel, west of Don River	Onsite/ Offsite	VOCs, PAHs, PHCs, metals, OC Pesticides, Chlorophenols	Soil and Groundwater	YES	APEC-061	PCA within Study Area	FIP, AER	-	1913, 1924
32- Iron and Steel Manufacturing and Processing	62	Iron Manufacturing - 1913 and 1924 FIPs show the National Iron Corporation Limited on a parcel of land located at the northwestern corner of Cherry Street on the north side of the Keating Channel, extending west to Parliament Street.	Northwestern corner of Cherry Street and Keating Channel	Onsite/ Offsite	Metals, PAHs, phenols (ABNs) (if foundry sand), PHCs	Soil and Groundwater	YES	APEC-062	PCA within Study Area	FIP, AER	-	1913, 1924
50 - Soap and Detergent Manufacturing, Processing and Bulk Storage	63	Soap Manufacturing - 1903, 1913, and 1924 FIPs shows the Sunlight Soap Works plant. Expansion to the main plant building is evident in the FIPs over the years, as is the construction of additional buildings.	South of Eastern Avenue, west of Don River, north of CNR Rail lines	Offsite	pH, SAR	Soil and Groundwater	YES	APEC-063	PCA upgradient of Study Area	FIP	-	1903, 1913, 1924
NA	64	Former Coal Storage - 1958 FIP indicates that Canada Coal Ltd. occupied 238 Cherry Street.	238 Cherry Street	Onsite	Metals, PAHs	Soil and Groundwater	YES	APEC-064	PCA within Study Area	HER	DCS, 2002	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	65	Former USTs/ASTs - EcoLog ERIS report cited in Golder (2013) indicated the presence of a 757-L tank of gasoline from 1919 and 1928 and a 378-L tank of gasoline in 1921 at 256 Cherry Street associated with Century Coal Ltd.	256 Cherry Street	Onsite	PHCs, BTEX, metals (lead)	Soil and Groundwater	YES	APEC-065	PCA within Study Area	HER	Golder, 2013	-
44 - Port Activities, including Operation and Maintenance of Wharves and Docks	66	Former Marine Terminal - According to City Directories, portions of 242 Cherry Street were used as a marine terminal/wharf from approximately 1925 to 1982.	242 Cherry Street	Onsite	PHCs, VOCs, metals, PAHs	Soil and Groundwater	YES	APEC-066	PCA within Study Area	HER	DCS, 2002	-
58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	67	Recycling and Waste Transfer Station - EcoLog ERIS report cited in Golder (2013) indicates that Turtle Island Recycling has several convictions under the Environmental Protection Act, for failure to comply with their Certificate of Approval, including illegal storage of wastes outdoors. The property is currently used as a recycling and waste transfer station operated by GFL Environmental.	242 Cherry Street	Onsite	Metals/inorganics, PAHs, PAHs, VOCs, PCBs, PHCs	Soil and Groundwater	YES	APEC-067	PCA within Study Area	HER	Golder, 2013	-
NA	68	Former Coal Storage - Century Coal occupied 256 and 312 Cherry Street from approximately 1932 to the late 1950s.	256 and 312 Cherry Street	Onsite	Metals, PAHs	Soil and Groundwater	YES	APEC-068	PCA within Study Area	HER	Golder, 2013	-
52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	69	Vehicle Maintenance and Storage - Golder (2014) reports that 54 Commissioners was used for personal vehicle maintenance between approximately 1995 and 2011, with vehicle storage occurring in the southwestern corner and along the western property boundary.	54 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-069	PCA within Study Area	HER	Golder, 2014	-
NA	70	Former Overhead Cranes - Crane runways/travelling cranes are depicted on both sides of the main building at 80 Commissioners on FIPs and City of Toronto drawings from 1941 and 1951. It is unknown whether these cranes were operated with hydraulics or other fuels.	80 Commissioners Street	Onsite	Metals, PHCs	Soil and Groundwater	YES	APEC-070	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	71	Waste Drum Storage and Potential UST - DSC (2002b) reports that they had previously observed an above ground fill pipe (potentially associated with a UST) and approximately 50 drums of used oil and paint sludges "on the northern limit" of the property during a Site visit in 1992.	80 Commissioners Street	Onsite	Metals, PHCs, VOCs	Soil and Groundwater	YES	APEC-071	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	72	ASTs - Two fuel ASTs were located at 80 Commissioners at the time of the DSC (2002b) site visit. One (2,270-L) was located on the exterior wall of the main building (northeast side) contained waste oil and the second (2,270-L) was located inside an area where generators are stored/serviced containing new oil. A third AST containing waste antifreeze (1,820-L) was located west of the exterior waste oil AST.	80 Commissioners Street	Onsite	Metals, PHCs, BTEX, glycols	Soil and Groundwater	YES	APEC-072	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	73	Former AST - DSC (2002b) reports that based on a review of a 1998 subsurface investigation, an aboveground heating oil storage tank may have historically been located in the southwestern corner of 80 Commissioners. The 1998 study advanced a test pit in this area and encountered hydrocarbon impacts, which were attributed to the oil tank. DSC (2002b) reports that the tank was not present during their site visit in 2002.	80 Commissioners Street	Onsite	PHCs, PHCs, BTEX	Soil and Groundwater	YES	APEC-073	PCA within Study Area	HER	DCS, 2002b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	74	AST - Golder (2014b) reports the presence of a diesel AST (without secondary containment), observed along the eastern property boundary of 130 Commissioners Street.	130 Commissioners Street	Onsite	PAHs, PHCs, BTEX	Soil and Groundwater	YES	APEC-074	PCA within Study Area	HER	Golder, 2014b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	75	AST - Golder (2014b) reports the presence of a diesel AST (without secondary containment), observed along the southern property boundary of 130 Commissioners Street.	130 Commissioners Street	Onsite	PAHs, PHCs, BTEX	Soil and Groundwater	YES	APEC-075	PCA within Study Area	HER	Golder, 2014b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	76	ASTs - Golder (2014b) reports the presence of two heating oil ASTs (without secondary containment), observed external to the northeast corner of the office building at 130 Commissioners Street.	130 Commissioners Street	Onsite	PHCs, PHCs, BTEX	Soil and Groundwater	YES	APEC-076	PCA within Study Area	HER	Golder, 2014b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	77	Potential UST - Golder (2014b) reports that a UST associated with a former pump island may have been located to the west of the Scale House at 130 Commissioners Street based on previous observations made by WESA of a fill port and vent pipe. A Site representative confirmed that gasoline was once dispensed from that area.	130 Commissioners Street	Onsite	PHCs, BTEX, metals (lead)	Soil and Groundwater	YES	APEC-077	PCA within Study Area	HER	Golder, 2014b	-
49 - Salvage Yard, including automobile wrecking 34 - Metal Fabrication	78	Scrap Metal Recycling - The property at 130 Commissioners Street has been used as a scrap metal recycling facility since the 1940s. A smelting furnace was reported to have been used to burn off the coverings and insulation from cables and wires.	130 Commissioners Street	Onsite	Metals and inorganics, VOCs, PHCs, PCBs	Soil and Groundwater	YES	APEC-078	PCA within Study Area	HER	Golder, 2014b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	79	Former ASTs - Golder (2014b) reports that two fuel oil ASTs were formerly present along the western exterior wall of the warehouse based on a 1979 FIP.	130 Commissioners Street	Onsite	PHCs, PAHs, BTEX	Soil and Groundwater	YES	APEC-079	PCA within Study Area	HER	Golder, 2014b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	80	Former ASTs - Golder (2014b) reports that a fuel oil AST was formerly present within the southwestern corner of the warehouse (washroom/change room addition) based on a 1979 FIP.	130 Commissioners Street	Onsite	PHCs, PAHs, BTEX	Soil and Groundwater	YES	APEC-080	PCA within Study Area	HER	Golder, 2014b	-
28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	81	Bulk Tank Farm - A 1947 aerial shows a bulk tank farm on the east side of the mouth of the Don River at the Keating Channel. It is unknown whether these tanks are associated with the British North American Oil Company tank farm located on the west side of the Don River (as shown on the 1924 FIP), or Imperial Oil tank farm located at the Don Roadway and Villiers Street (as shown on a 1951 FIP). The tank farm is not present in an 1950 aerial image, where a factory/plant and associated buildings are now visible. Prior to 1947, this parcel appeared vacant on the 1924 FIP, and as the "Gooderham & Worts cattle sheds" from 1884 to 1913.	21 Don Roadway	Onsite	PHCs, VOCs, PAHs, metals	Soil and Groundwater	YES	APEC-081	PCA within Study Area	FIP, AER	-	1884, 1899, 1903, 1913, 1924
34 - Metal Fabrication	82	Machine Shop - A machine shop is shown on a 1951 FIP associated with the Toronto Dry Dock Company and one associated with the Toronto Harbour Commissioners.	62 Villiers Street	Onsite	Metals, PHCs, VOCs, PAHs	Soil and Groundwater	YES	APEC-082	PCA within Study Area	HER	Terrapex, 2009	-
28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	83	Bulk Tank Farm - 1951 FIP shows five bulk ASTs covering the entire southern portion of 309 Cherry Street.	309 Cherry Street	Onsite	PHCs, VOCs, PAHs, metals	Soil and Groundwater	YES	APEC-083	PCA within Study Area	HER	Terrapex, 2009	-
50 - Soap and Detergent Manufacturing, Processing and Bulk Storage	84	Soap Manufacturing - It was reported that the Unilever Company operated out of a factory at 21 Don Roadway from the 1950s until 2012.	21 Don Roadway	Onsite	pH, SAR	Soil and Groundwater	YES	APEC-084	PCA within Study Area	AER	-	-

Table 2-1. Potentially Contaminating Activities within the CBRA Area
Port Lands, Toronto, ON

Potentially Contaminating Activity (PCA)[a]	PCA Unique ID	Descriptions of PCAs	Location of PCA[b]		Contaminants of Potential Concern (based on AP method groups[c])	Media Potentially Impacted (groundwater and/or soil)	PCA Results in APEC	Resulting APEC	Rationale	Information Source	HER Reference (as applicable)	FIP Reference (as applicable)
46 - Rail Yards, Tracks and Spurs	85	Rail Yard - A rail yard is present in current aerial photographs and those dating back to 1947.	Northeast corner Don River and Lake Shore Boulevard East	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-085	PCA within Study Area	AER	-	-
10 - Commercial Autobody Shops	86	Repair Garage - CRA (2010) reports that the property located at 480 Lake Shore Boulevard East is current used as an automobile repair business.	480 to 520 Lakeshore Boulevard East	Onsite/ Offsite	PHCs, VOCs, metals	Soil and Groundwater	YES	APEC-086	PCA within Study Area	HER	CRA, 2010	-
36 - Oil Production	87	Oil Pipeline - A Trans-Northern Pipeline meter station is located on the east side of the Don Roadway, just north of Lakeshore Boulevard East. The status and route of the pipeline in this area is not known.	Don Roadway, north of Lake Shore Boulevard East	Onsite	PHCs, VOCs, metals, PAHs	Soil and Groundwater	YES	APEC-087	PCA within Study Area	AER	-	-
58-Waste Disposal and Waste Management 30-Importation of Fill Material of Unknown Quality	88	Soil Remediation Facility - Harbour Remediation & Transfer Inc. occupied 97 Commissioners Street from approximately 1994 to present.	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-088	PCA within Study Area	HER	Dames & Moore, 1994	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	89	Former UST - Former UST, diesel pump and vent pipe reported by Dames & Moore (1994) to be present on the east portion of 97 Commissioners Street property, immediately south of the office building. At the time the report was written, the UST had been removed; the fuel pump was still present onsite.	97 Commissioners Street	Onsite	PHCs, PAHs, BTEX	Soil and Groundwater	YES	APEC-089	PCA within Study Area	HER	Dames & Moore, 1994	-
58-Waste Disposal and Waste Management	90	Waste and Chemical Product Storage - Dames & Moore (1994) reported nine 500 gallon storage drums grouped together at 97 Commissioners Street. Three drums were rusted and empty; one was full without a label; one was half full and in good condition labelled "Texaco multigrear EP". Rusted metal pipes were stored next to the drums. The location of the drum storage area is unclear as the report text described the area to be on the east side of the property while the appended photo describes the area to be present along the west property boundary. Both areas have been included on the PCA/APEC map.	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-090	PCA within Study Area	HER	Dames & Moore, 1994	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	91	Former ASTs/Storage Silos-Three large storage silos/ASTs were present on the southeast portion of 97 Commissioners Street; one was reported to be used as a water storage tank, the contents of the remaining two ASTs are unknown. Asphalt and concrete secondary containment berms were present around the tanks. All tanks were empty at the time of the D&M investigation.	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-091	PCA within Study Area	HER	Dames & Moore, 1994	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	92	Former ASTs/Storage Silos - Two storage silos/ASTs were present immediately south of the processing building (larger building) on 97 Commissioners Street. The contents of the two ASTs are unknown. Asphalt and concrete secondary containment berms were present around the tanks. All tanks were empty at the time of the D&M investigation.	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-092	PCA within Study Area	HER	Dames & Moore, 1994	-
55-Transformer Manufacturing, Processing and Use	93	Transformer Station - Dames and Moore (1994) reported the presence of a transformer station on the west side of the processing building at 97 Commissioners Street enclosed in a chain-link fence. Aerial photographs from the early 1970s indicated the presence of the transformer station however no date was visible on the outside transformer during the D&M site visit. It was not confirmed whether the transformer contained PCBs.	97 Commissioners Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-093	PCA within Study Area	HER	Dames & Moore, 1994	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	94	Oil Separator - D&M (1994) reported the presence of a two stage oil separator along the north wall of the processing building (larger building). A monitoring well was discovered by D&M in this area which contained Waterra tubing covered in residual diesel oil and water removed from the well had a black oily sheen and strong hydrocarbon odour.	97 Commissioners Street	Onsite	PHCs, PAHs, BTEX	Soil and Groundwater	YES	APEC-094	PCA within Study Area	HER	Dames & Moore, 1994	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	95	Former AST - Dames and Moore (1994) reported the presence of a former AST along the western boundary of 97 Commissioners Street.	97 Commissioners Street	Onsite	VOCs, PAH, PHCs	Soil and Groundwater	YES	APEC-095	PCA within Study Area	HER	Dames & Moore, 1994	-
49-Salvage Yard, including automobile wrecking	96	Rusted scrap metal parts and pile of metal pipes-Dames and Moore (1994) reported an area at the northwest corner of the processing building with a variety of rusted scarp metal parts and a pile of metal pipes.	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs, PCBs	Soil and Groundwater	YES	APEC-096	PCA within Study Area	HER	Dames & Moore, 1994	-
46-Rail Yards, Tracks and Spurs	97	Former Rail Spurs - Figure included in the Dames and Moore (1994) report shows a rail spur entering 97Commissioners along the centre western property boundary and terminating at the middle of the south property boundary. Based on current aerials of the site, the rail spurs no longer appear to be present.	97 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC Pesticides, Chlorophenols	Soil and Groundwater	YES	APEC-097	PCA within Study Area	HER	Dames & Moore, 1994	-
20-Explosives and Ammunition Manufacturing, Production and Bulk Storage	98	Artillery Shell Manufacturing - DSC (2000, 2009) and Golder (1991) reported that the property south of Commissioners Street were used for artillery shell manufacturing by British Forgings Limited during the First World War.	51, 75, 85, 99, 99a Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-098	PCA within Study Area	HER	DSC, 2000; DCS (2009); Golder, 1991	-
28-Gasoline and Associated Products Storage in Fixed Tanks	99	Bulk Tank Farm - According to DSC (2009) 75 Commissioners (formerly 85 Commissioners before being severed) was used as a bulk fuel storage tank farm by McColl Frontenac from approximately 1949 to 1964.	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-099	PCA within Study Area	HER	DSC, 2009	-
52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	100	Tractor Trailer Parking - Canadian Pacific Express used this 75 Commissioners Street for tractor trailor parking purposes (1964-1988) before it was severed from 85 Commissioners Street (DCS, 2000).	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-100	PCA within Study Area	HER	DSC, 2000	-
58 - Waste Disposal and Waste Management	101	Solid Waste Recycling Operation - DCS (2009) reported that Harkow Recycling and Aggregates operated a waste recycling facility at 75 Commissioners Street (1994-1999). According to Terrapex (2009) 75 Commissioners Street was listed from United Rentals and SP Canadian Film Production Inc. for a variety of wastes such as aromatic and aliphatic solvents, petroleum distillates, light fuels, waste oils & lubricants, crankcase oils, and paint, pigment and coating residues from 2001-2009.	75 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-101	PCA within Study Area	HER	DSC, 2009	-
52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems 11 - Commercial Trucking and Container Terminals	102	Heavy Equipment Rental Company - DCS (2000) reported that United Rentals, a heavy equipment rental company, leased the north portion of the 75 Commissioners Street property from 2000 to present. The portion of the site leased was to be used as an office and equipment yard used for storage maintenance and refuelling purposes.	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-102	PCA within Study Area	HER	DSC, 2000	-
8 - Chemical Manufacturing, Processing and Bulk Storage 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	103	Chemical Storage - DCS (2000) reported the presence of waste materials such as waste oils, hydraulic oils, xylene, gas cylinders, paint, grease in the work bay in the northern portion of the north building present at 75 Commissioners Street during their investigation in 2000. Staining of floor surfaces (oil and grease covered an 120 m^2 area) and product release stains were also noted during DCS (2000) investigation.	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-103	PCA within Study Area	HER	DSC, 2000	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	104	ASTs - Noted in the Terrapex (2009) report the presence of ASTs/jerry can along the eastern boundary of 75 Commissioners.	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-104	PCA within Study Area	HER	Terrapex, 2009	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	105	Tank Farm - DSC (2009) reported that the property at 85 Commissioners Street was used for bulk fuel storage tank farm by McColl Frontenac (1964-1988).	85 Commissioners Street	Onsite	PHC, metals/inorganics, PAHs, VOCs, BTEX	Soil and Groundwater	YES	APEC-105	PCA within Study Area	HER	DSC, 2009	-
52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	106	Truck Storage - DSC (2009) reported that the fuel storage tank farm was removed from the property at 85 Commissioners Street. Both 85 and 95 Commissioners Street were subsequently used for truck storage by Canadian Pacific Express and Transport .	85 and 95 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-106	PCA within Study Area	HER	DSC, 2009	-
30 - Importation of Fill Material of Unknown Quality	107	Imported Fill - DSC (2009) reported the presence of a small berm of fill material along the south portion of 85 Commissioners Street.	85 Commissioners Street	Onsite	Metals/inorganics, PAHs, PHCs	Soil and Groundwater	YES	APEC-107	PCA within Study Area	HER	DSC, 2009	-
NA	108	Lead Paint and Piping - Terrapex (2009) reported that painted surface with suspected lead based paints or solder joints of drain piping were present onsite.	85 Commissioners Street	Onsite	Metals (lead)	Soil and Groundwater	YES	APEC-108	PCA within Study Area	HER	Terrapex, 2009	-
58 - Waste Disposal and Waste Management 45 - Pulp, Paper and Paperboard Manufacturing and Processing	109	Solid Waste Recycling Operation - DCS (2009) reported that Consolidated Fibres operated a wood and paper recycling operation on 95 Commissioners Street between 1972-1985/86. Plymouth Paper Products was also noted to be present at 95 Commissioners during this period. DCS (2009) reported the presence of various waste recycling facilities including First Canadian Recycling Ind. Ltd, Quno Recycling Corp and Donohue Recycling Inc. during the period of 1989 to 2005. Wastes noted to be present on site include waste oils and lubricants, paint, pigment, coating residues, polymeric resins, oil skimmings and sludges. Both 85 and 95 Commissioners were listed with a CoA for waste disposal transfer station under Harkow Recycling Ltd. in 1998 and 1999.	85 and 95 Commissioners Street	Onsite	PHC, metals/inorganics, PAHs, VOCs, BTEX	Soil and Groundwater	YES	APEC-109	PCA within Study Area	HER	DSC, 2009	-
55 - Transformer Manufacturing, Processing and Use	110	Transformers - Fluorescent light fixtures, floor and wall mounted transformers were noted by Terrapex (2009) in the industrial building on 95 Commissioners Street.	95 Commissioners Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-110	PCA within Study Area	HER	Terrapex, 2009	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	111	Potential Former AST- Terrapex (2009) noted that a 1991 Golder report discussed the presence of a 2,250 L AST containing diesel fuel located in the loading dock area of 95 Commissioners Street for refuelling front end loaders. The site was listed as a private fuel outlet under Quebec and Ontario Paper Recycling Ltd.	95 Commissioners Street	Onsite	PHCs, PAHs, BTEX	Soil and Groundwater	YES	APEC-111	PCA within Study Area	HER	Terrapex, 2009	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	112	Former USTs - Terrapex (2009) noted the presence of a 9,000 L UST present in the southwest corner of 95 Commissioners Street. The UST was installed in 1974 and reportedly removed in 1993. A single wall UST containing diesel fuel was reportedly installed at 95 Commissioners in 1993. Terrapex (2009) noted that it was unclear as to whether there was one or two USTs associated with 95 Commissioners Street.	95 Commissioners Street	Onsite	BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-112	PCA within Study Area	HER	Terrapex, 2009	-

Table 2-1. Potentially Contaminating Activities within the CBRA Area

Port Lands, Toronto, ON

Potentially Contaminating Activity (PCA)[a]	PCA Unique ID	Descriptions of PCAs	Location of PCA[b]		Contaminants of Potential Concern (based on AP method groups[c])	Media Potentially Impacted (groundwater and/or soil)	PCA Results in APEC	Resulting APEC	Rationale	Information Source	HER Reference (as applicable)	FIP Reference (as applicable)
46-Rail Yards, Tracks and Spurs	113	Rail Spurs - According to Terrapex (2009), a CN rail spur line was present at the east side of the industrial building on 95 Commissioners Street.	95 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-113	PCA within Study Area	HER	Terrapex, 2009	-
47-Rubber Manufacturing and Processing	114	Used Rubber Recycling-DSC (2009) reported that National Rubber Technologies (used rubber recycler) was present on 99 Commissioners Street from 1993 until the year the report was written in 2009.	99 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-114	PCA within Study Area	HER	DSC, 2009	-
46 - Rail Yards, Tracks and Spurs	115	Rail Spurs - According to DCS (2009), rail tracks associated with the former British Forging operation formerly traversed the north portion of 99 Commissioners Street.	99 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-115	PCA within Study Area	HER	DSC, 2009	-
8 - Chemical Manufacturing, Processing and Bulk Storage 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	116	Chemical Storage - DCS (2009) reported the presence of a chemical storage enclosure on 99 Commissioners Street used to contain waste materials, 4,500L diesel fuel tank (appears to be in an AST) for NRT vehicles and lubricating oils, located along the west fence line south of the main building. Stained areas were observed on the adjacent concrete refuelling pad to the east of the enclosure during the DCS (2007) investigation. The diesel AST was constructed of steel and placed within a steel containment structure which was surrounded by a low concrete containment wall. No staining due to fuel spillage was observed around the storage tank however 15 cm of fuel was present at the base of the steel containment unit.	99 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-116	PCA within Study Area	HER	DSC, 2009	-
58 - Waste Disposal and Waste Management	117	Oil water separator - DSC (2009) reported that an oil water separator was present in the northcentral portion of the main building on the 99 Commissioners Street Property. Oil skimmings are pumped directly from the oi/water separator into a disposal truck.	99 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs	Soil and Groundwater	YES	APEC-117	PCA within Study Area	HER	DSC, 2009	-
47 - Rubber Manufacturing and Processing	118	Used Rubber Manufacturing Plant - DCS (2009) reported that the main building on the 99 Commissioners Street property is used solely for the storage and recycling of used vehicle tires. The southern half of the building serves as the receiving and storage area for the tires. The northern half of the building is occupied by several tire shredding lines, product storage and a maintenance shop. Process equipment used to melt shredded tire material (crumb) was also located in the north half of the building.	99 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-118	PCA within Study Area	HER	DSC, 2009	-
55 - Transformer Manufacturing, Processing and Use	119	Transformer Compound - DCS (2007) noted during their investigation that a transformer compound was present on the north west side of the main building on 99 Commissioners Street. DSC (2007) noted during their investigation that no equipment suspect of containing PCBs was observed as the main building was constructed 13 years after the federal ban on PCBs in new equipment.	99 Commissioners Street	Onsite	PCBs, PHCs, VOCs	Soil and Groundwater	YES	APEC-119	PCA within Study Area	HER	DSC, 2007	-
52-Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems NA	120	Fuel and Coal Storage-DCS(2009) reported that the 99A Commissioners Street was used for coal storage by Regal Coal Co. Ltd and fuel storage by Supertest Petroleum Co. Ltd between 1949 and 1961.	99a Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	Soil and Groundwater	YES	APEC-120	PCA within Study Area	HER	DSC, 2009	-
58 - Waste Disposal and Waste Management	121	Waste Processing Activities - DCS (2009) reported that 99 Commissioners Street was used by Harkow Aggregates for waste processing activities sometime after 1978 until 1989. During Harkow's occupancy of the property, a larger sized building was located within the south western part of the site with a smaller building in the northeast part of the site.	99a Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs,	Soil and Groundwater	YES	APEC-121	PCA within Study Area	HER	DSC, 2009	-
12 - Concrete, Cement and Lime Manufacturing 58 - Waste Disposal and Waste Management	122	Waste/Debris Piles - DSC (2009) reported that 99A Commissioners Street was vacant from approximately 1989 until the time their report was written and that numerous piles (one as high as 10 m) of brick, concrete and intermixed debris have been deposited on a majority of the site footprint, which has significantly reduced access to much of this property.	99a Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs, pH	Soil and Groundwater	YES	APEC-122	PCA within Study Area	HER	DSC, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	123	Former Tank Farm - Based on 1935 and 1951 FIPs and City Directories, Terrapex (2009) reported that the property at 225 Commissioners Street (formerly 101 Commissioners) was used as bulk fuel storage tank farm by Imperial Oil Ltd (mid 1930s-1980). 1935 FIP shows two 3,000,000 gal ASTs (oil tanks); 1953 aerial photo showed approximately 12 ASTs, 1951 FIP indicated 6 of these were 350,000-850,000 gal ASTs.	225 Commissioners (formerly 101 Commissioners)	Onsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-123	PCA within Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage 58 - Waste Disposal and Waste Management	124	Former Holding Pond - Based on a 1965 aerial photo (Terrapex, 2009), there appears to be a holding pond present in the southwest portion of 225 (formerly 101) Commissioners Street.	225 Commissioners (formerly 101 Commissioners)	Onsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-124	PCA within Study Area	HER	Terrapex, 2009	-
46 - Rail Yards, Tracks and Spurs	125	Rail Sidings - According to the 1951 FIPs (Terrapex, 2009) rail sidings were present on north porton of 225 (former 101) Commissioners Street.	225 Commissioners (formerly 101 Commissioners)	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-125	PCA within Study Area	HER	Terrapex, 2009	-
46 - Rail Yards, Tracks and Spurs	126	Rail Sidings - According to the 1951 FIPs (Terrapex, 2009) rail sidings were present south porton of 185 Villiers Street.	185 Villiers Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-126	PCA within Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	127	Former Fuel Oil Tank Farm - According to the 1951 FIP (Terrapex, 2009), Imperial Oil Ltd Bulk Plant had 6 steel ASTs ranging in size from approximately 2,000,000-3,000,000 gal on 185 Villiers Street.	185 Villiers Street	Onsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-127	PCA within Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	128	Former Fuel Oil Tank Farm - According to a 1951 FIP (Terrapex, 2009) Imperial Oil Ltd has 3 former fuel oil ASTs raning from approximately 1,000,000-2,000,000 gal at 625-675 Lake Shore Boulevard.	625-675 Lake Shore Boulevard	Onsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-128	PCA within Study Area	HER	Terrapex, 2009	-
9 - Coal Gasification	129	Former Coal Tar Distillation - According to the 1951 FIP (Terrapex, 2009), The Barrett Co. used this property at 685 Lake Shore Boulevanrd for distilling of crude cola tar and saturating roofing felt.	685 Lake Shore Boulevard	Offsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-129	PCA adjacent to Study Area	HER	Terrapex, 2009	-
46 - Rail Yards, Tracks and Spurs	130	Rail Sidings - According to the 1951 FIPs (Terrapex, 2009) rail sidings were on the central portion of 685 Lake Shore Blvd (1951 FIP; Terrapex, 2009)	685 Lake Shore Boulevard	Offsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-130	PCA adjacent to Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	131	Former Fuel Oil AST- According to the 1953 FIP (Terrapex, 2009) 225 Commissioners street had one 4,500,000 gal fuel oil tank owned by Fuel Oil Equipment Ltd.	225 Commisioners Street	Offsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-131	PCA adjacent to Study Area	HER	Terrapex, 2009	-
28 - Gasoline and Associated Products Storage in Fixed Tanks	132	Former ASTs - According to the 1953 and 1973 FIPs (Terrapex, 2009), Sun Oil Co. had 5-6 ASTs (at least 2 appear to be upward of 2,800,000 gal gasoline tanks) on the east portion of 225 Commissioners Street immediately east of the Fuel Oil Equipment AST.	225 Commisioners Street	Offsite	PHCs, BTEX, PAHs, metals (for gasoline tanks)	Soil and Groundwater	YES	APEC-132	PCA adjacent to Study Area	HER	Terrapex, 2009	-
NA	133	Former Coal Storage - According to the 1953 FIP in the Terrapex (2009) report, J. Frank Jones Coal Ltd. stockpiled coal at 15 and 1-17 Basin Street.	15 and 1-17 Basin Street	Offsite	PAHs, metals	Soil and Groundwater	YES	APEC-133	PCA adjacent to Study Area	HER	Terrapex, 2009	-
30 - Importation of Fill Material of Unknown Quality	134	Soil Material Stockpiles - Based on an aerial Google view of the site at 1-17 Basin Street there appears to be stock piled material along the southern portion of the property.	1-17 Basin Street	Offsite	<etals/inorganics, PAHs, PHCs	Soil and Groundwater	YES	APEC-134	PCA adjacent to Study Area	AER	-	-
58 - Waste Disposal and Waste Management 41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	135	Former Fuel Oil ASTs - According to the 1953 FIP (Terrapex, 2009), Fuel Oil Equipment Ltd occupied the property at 23 and 23 R Basin Street; 2 fuel oil ASTs were present (8,500,000 gal and 845,000 gal) and an oil and greasing room appear in the 1953 FIP.	23/23 R Basin Street	Offsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-135	PCA adjacent to Study Area	HER	Terrapex, 2009	-
30 - Importation of Fill Material of Unknown Quality	136	Soil Material Stockpiles - Based on an aerial Google view it appears that soil material is being stockpiled on the property at 101 Commissioners Street.	101 Commissioners Street	Onsite	Metals/inorganics, PAHs, PHCs	Soil and Groundwater	YES	APEC-136	PCA within Study Area	AER	-	-
28 - Gasoline and Associated Products Storage in Fixed Tanks 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	137	Former Tank Farm - According to 1951 and 1973 FIPs (Terrapex, 2009) Texaco Canada Oil Co. Ltd and McColl Frontenac Oil Co. used the majority of the block of land extending from 21 to 63 Commissioners Street (bound by Cherry Street to the west and the Shipping Channel to the south) as a tank farm. Approximately 34 ASTs were present across the site ranging in size from approximately 1600 barrels (Bbls) to more than 100,000 Bbls. Tanks contents varied across the site and included crude oil, benzol, furnace oil, gasoline, fuel oil and cycle (majority were approx. 80,000 Bbls). 28 smaller ASTs, approximately 1000 Bbls, were present in the northeast portion of the tank farm area and were noted to be blending and grease storage tanks. Texaco Canada occupied the western portion of the tank farm; McColl Frontenac occupied the eastern portion. Based on aerial photos from the Terrapex (2009) report, the tank farm was present on the property from 1947 until 1985; by 1992 many of the tanks had been removed. McColl Frontenac Oil Co. Ltd. – Oil Refinery (1925 to 1949); McColl Frontenac/Texaco – Petroleum Products Terminal, Blending, and Grease Plant (1949 to 1990); Imperial Oil (1990 to 1994). Historical reports indicate spills in the north section. LNAPL recovery program in 1990s. Full scale clean-up estimated to 310,000m^3 soil to 5.0 mbgs and 20,000 m^3 of LNAPL	21-63 Commissioners Street, 185 Cherry Street	Onsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-137	PCA within Study Area	HER	CH2M, 2007; Terrapex, 2009	-

Table 2-1. Potentially Contaminating Activities within the CBRA Area

Port Lands, Toronto, ON

Potentially Contaminating Activity (PCA)[a]	PCA Unique ID	Descriptions of PCAs	Location of PCA[b]		Contaminants of Potential Concern (based on AP method groups[c])	Media Potentially Impacted (groundwater and/or soil)	PCA Results in APEC	Resulting APEC	Rationale	Information Source	HER Reference (as applicable)	FIP Reference (as applicable)
41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	138	Former Oil Separator - According to a 1951 FIP (Terrapex, 2009) an oil seperator was present immediately northwest of the tank farm on the former Texaco Canada lands at 21 Commissioners Street. The oil seperator was likely part of Texaco Canada operations to the immediate south.	21 Commisioners Street	Onsite	PHCs, BTEX, PAHs	Soil and Groundwater	YES	APEC-138	PCA within Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	139	Former ASTs - According to a 1951 FIP (Terrapex, 2009) seven 500 Bbls marketing tanks were present in the northwest portion of the property at 21 Commissioners Street. Another four smaller ASTs were present immediately west of the marketing tanks, south of the garage. These tanks were likely part of the Texaco Canada operations to the immediate south.	21 Commisioners Street	Onsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-139	PCA within Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	140	Former Garage - According to a 1951 FIP (Terrapex, 2009) a garage was present at the northwest corner of the property at 21 Commissioners Street.	21 Commisioners Street	Onsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-140	PCA within Study Area	HER	Terrapex, 2009	-
59 - Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products	141	Cabinet Manufacterer - According to a 1951 FIP (Terrapex, 2009) a building that housed Kent McClain Ltd Cabinet Manufacturing was present in the north portion of 31-39 Commissioners Street. Noted within the building were a glue department, box making, finishing room and a garage immediately west of the main building. A smaller shipping and storge area was present immediately east of the main building.	31-39 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-141	PCA within Study Area	HER	Terrapex, 2009	-
41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	142	Blending and Grease Building, Tank House, Drum Reconditioning-shown in the 1951 FIP (Terrapex, 2009) as part of the McColl Fontenac operations at 63 Commissioners Street.	63 Commissioners Street	Onsite	PHCs, BTEX, PAHs, metals	Soil and Groundwater	YES	APEC-142	PCA within Study Area	HER	Terrapex, 2009	-
43 - Plastics (including Fibreglass) Manufacturing and Processing	143	Polymerization Plant - According to a 1951 FIP (Terrapex, 2009) a polymerization plant was present on the McColl Frontenac portion of the tank farm area (northwest portion) and appeared to be part of the oil processing operations part of the tank farm.	5741 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Soil and Groundwater	YES	APEC-143	PCA within Study Area	HER	Terrapex, 2009	-
46 - Rail Yards, Tracks and Spurs	144	Rail Sidings - According to the 1951 and 1973 FIPs (Terrapex, 2009) rail sidings were on the central north and south portion of the site occupied by Texaco Canada and McColl Frontenac.	33-63 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	Soil and Groundwater	YES	APEC-144	PCA within Study Area	HER	Terrapex, 2009	-

Notes:

[a] PCA – potentially contaminating activity (as defined by O.Reg. 153/04, as amended)

[b] Refer to Figure 4A through 4E for PCA/APEC locations

[c] As noted in the "*Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*" March 9, 2004, amended as of July 1, 2011.

NA - Not applicable, the PCA does not fit into the available MOECC PCA types, however is still considered of potential environmental concern as a PCA.
"-" - no information
ABNs - acid-base neutrals
AER - Aerial Photograph
APEC – Area of Potential Environmental Concern
AST – Aboveground storage tank
BTEX – Benzene, toluene, ethylbenzene, and xylenes
cm - centimetres
EC – Electrical conductivity
FIP – Fire insurance plan
HER – Historical Environmental Reports
ID – Identification
L - litres
LNAPL - light non-aqueous phase liquid
m – metre
m^3 – cubic metres
mbgs - metres below ground surface
MOECC – Ontario Ministry of the Environment and Climate Change
offsite – on an adjacent or adjoining property to the Study Area
onsite – within the Port Lands Study Area
PAHs – Polycyclic aromatic hydrocarbons
PCA – Potentially contaminating activity
PCBs – Polychlorinated biphenyls
PHCs – Petroleum hydrocarbons
SAR – Sodium adsorption ratio
UST – Underground storage tank
VOCs – Volatile organic compounds

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-001	AST - A fuel oil AST was located within the warehouse building at 54 Commissioners Street. Golder (2014) observed that the AST did not have secondary containment and that localized staining of the floor was observed in the vicinity of the AST.	28 - Gasoline and Associated Products Storage in Fixed Tanks	54 Commissioners Street	Onsite	BTEX, PHCs, PAHs	PAHs, PCB, PHC, VOC/BTEX	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil only. No groundwater sampling completed at APEC.
APEC-002	Former Foundry and Former Steel Machine Shop - A former foundry was reported to have been located on 309 Cherry Street from 1912 to 1917, and a former steel machine shop from 1928 to 1935. Heavy metals found in soils from previous investigations.	32 - Iron and Steel Manufacturing and Processing 33 - Metal Treatment, Coating, Plating and Finishing 34 - Metal Fabrication	309 Cherry Street	Onsite	VOCs, PAHs, PHCs, complete metals and inorganics, phenols (ABNs) (if foundry sand)	ABN, pH, PAHs, VOCs, metals/inorganics, PCBs, PHCs	ABN, pH, PAHs, VOCs, metals/inorganics, PCBs, PHCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-003	Machine Shop and Foundry - The Queen's Foundry and later the Bond Engineering Works operated at 16 Munition Street from approximately 1917 to the 1970s. Historical reports indicate metal exceedances to 1.0 mbgs.	32 - Iron and Steel Manufacturing and Processing 33 - Metal Treatment, Coating, Plating and Finishing 34 - Metal Fabrication	10 to 16 Munition Street	Onsite	VOCs, PAHs, PHCs, complete metals and inorganics, phenols (ABNs) (if foundry sand)	None	None	No sample locations associated with APEC
APEC-004	Former Steel Fabrication, Metal Working and Shop - Structural Steel Fabrication (1920s to 1950s) and Metal Working and Shop Repair (1960s to 1980s). Impacts reported from historical reports to a depth of 1.5 mbgs (PHCs, PAHs, EC).	32 - Iron and Steel Manufacturing and Processing 34 - Metal Fabrication	80 Commissioners Street	Onsite	Metals, PAHs, phenols (ABNs) (if foundry sand)	pH, PAHs, VOCs, metals/inorganics, PCBs, PHCs	pH, PAHs, VOCs, metals/inorganics, PHCs	Not all COCs have been captured by current or historical sampling activities. Phenols (ABNs) not currently analyzed for in soil or groundwater.
APEC-005	Former Steel Plant - British Forgings/Baldwin Steel Plant operated at this property from approximately 1914 to 1928.	32 - Iron and Steel Manufacturing and Processing 34 - Metal Fabrication	21-51 and 63, 75, 85, 95, 99, 99a Commissioners Street, 181 to 185 Cherry Street	Onsite	Metals, PAHs, phenols (ABNs) (if foundry sand)	pH, PAHs, VOCs, metals/inorganics, PHCs	pH, PAHs, VOCs, metals/inorganics, PHCs	Not all COCs have been captured by current or historical sampling activities. Phenols (ABNs) not currently analyzed for in soil or groundwater.
APEC-006	Former Coal Storage - McColl Bros. Ltd./McColl Frontenac/Texaco developed land on the east side of Cherry Street and used 222 Cherry Street for coal storage (late 1940s to early 1950s).	NA	222 Cherry Street	Onsite	Metals, PAHs	pH, PAHs, VOCs, metals/inorganics, PHCs, PCBs	pH, PAHs, VOCs, metals/inorganics, PHCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-007	Former Transformer Use - Presence of a row of four transformers shown on a 1973 FIP along the exterior of the east building wall.	55- Transformer Manufacturing, Processing and Use	222 Cherry Street	Onsite	PHCs, PCBs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	None	Not all COCs have been captured by current or historical sampling activities. PCBs not currently analyzed for in soil or groundwater. No groundwater sampling completed at APEC.
APEC-008	Former UST - Presence of a UST shown on a 1973 FIP at the extreme southwestern corner of the building, located beneath the loading dock extension.	28 - Gasoline and Associated Products Storage in Fixed Tanks	222 Cherry Street	Onsite	PHCs, VOCs, metals	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil; however, not all COCs have been captured for groundwater. PHCs not currently analyzed for in groundwater.
APEC-009	Salt Usage - Site was used as a grocery store from 1973 to 2000 with a large portion of the Site dedicated to parking where salt application for de-icing was conducted.	NA	222 Cherry Street	Onsite	Inorganics (EC, SAR)	pH, inorganics (incl. EC, SAR)/metals, PAHs, PCB, PHC, VOC	pH, inorganics (incl. EC, SAR)/metals, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-010	Fuel Oil Spill - EcoLog ERIS reports a fuel oil spill of unknown quantity from a UST located at 54 Polson Street in April 1993.	28 - Gasoline and Associated Products Storage in Fixed Tanks	54 Polson Street	Onsite	BTEX, PHCs, PAHs	None	None	No sample locations associated with APEC
APEC-011	Oil Spill - EcoLog ERIS reports a catch basin at 63 Polson Street which was overflowing with oil and migrated to Polson Street in May 2000.	28 - Gasoline and Associated Products Storage in Fixed Tanks	63 Polson Street	Onsite	BTEX, PHCs, PAHs	None	None	No sample locations associated with APEC
APEC-012	Cement Plant - Based on City Directories, Canada Cement Company/LaFarge Canada has operated at 54 Polsen Street (formerly Carton Street) since the early 1940s.	12 - Concrete, Cement and Lime Manufacturing	54 Polson Street	Onsite	pH	None	None	No sample locations associated with APEC
APEC-013	Former Coal Storage - City Directories list various coal companies at 190 Cherry Street between 1940 and 1951.	NA	190 Cherry Street	Onsite	Metals, PAHs	None	None	No sample locations associated with APEC

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-014	Former Coal Storage - 1953 FIP shows coal stockpiled on the western half of 20 Polson Street (Toronto Fuels Ltd.).	NA	20 Polson Street	Onsite	Metals, PAHs	pH, PAHs, VOCs, metals/inorganics, PHCs, PCBs, perchlorate	pH, PAHs, VOCs, metals/inorganics, PHCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-015	Former Coal Storage - 1951 FIP shows coal stockpiles across 176 Cherry Street (Toronto Fuels Ltd. and Ontario Dock & Forwarding Co. Ltd).	NA	176 Cherry Street	Onsite	Metals, PAHs	None	None	No sample locations associated with APEC
APEC-016	Imported Fill - Borehole logs for 20 Polson Street indicate the presence of fill materials .	30 - Importation of Fill Material of Unknown Quality	20 Polson Street	Onsite	Metals/inorganics, PAHs, PHCs	pH, PAHs, VOCs, metals/inorganics, PHCs, PCBs, perchlorate	pH, PAHs, VOCs, metals/inorganics, PHCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-017	Imported Fill - Borehole logs for 222 Cherry Street indicate the presence of fill materials.	30 - Importation of Fill Material of Unknown Quality	222 Cherry Street	Onsite	Metals/inorganics, PAHs, PHCs	pH, inorganics/ metals, PAHs, PHCs, VOCs, PCBs	pH, inorganics/metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-018	Former Rail Spurs - 1973 and 1976 FIPs shows a rail spur entering 222 Cherry Street in the northwestern corner and running the length of the western property boundary to the southern wall of the building; 1976 FIP shows a rail spur entering 20 Polson Street from the centre of the eastern property boundary and running through the centre of the property before terminating on Polson Street near the southwestern corner of the property; 1951, 1973, and 1976 FIPs shows rail spurs entering the 176 Cherry Street near the northeastern corner of the property. One set runs through to the centre of the property, while another creates a large oval and links back to the northeastern corner. 1951, 1973, and 1976 FIPs shows rail spurs running in a east-west direction along almost the entire length of Polson Street, terminating at Lake Ontario. 1951, 1973 and 1976 FIPs shows rail spurs entering 54 Polson Street in the northeastern corner with one spur running towards the southern boundary (1951 only) and additional spurs running through the centre of the property terminating near the western property boundary.	46 - Rail Yards, Tracks and Spurs	176, 222 Cherry Street; 1-63 Polson Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	pH, inorganics/ metals, PAHs, PHCs, VOCs, PCBs, Perchlorate	pH, inorganics/metals, PAHs, PHCs, VOCs	Not all COCs have been captured by current or historical sampling activities. OC Pesticides and chlorophenols not currently analyzed for in soil or groundwater.
APEC-019	Former Transformer Use - 1973 FIP shows a transformer located on the south side of a cluster of four concrete silos on 54 Polson Street, adjacent to Polson Street.	55- Transformer Manufacturing, Processing and Use	54 Polson Street	Onsite	PCBs, PHCs, VOCs	None	None	No sample locations associated with APEC
APEC-020	Scrap Metal Handling/Fabrication - 1973 FIP shows a scrap metal yard. City Directories list Warehouse Metals/Industrial Metal Co. of Canada between the years 1961 and 1982.	32 - Iron and Steel Manufacturing and Processing 34 - Metal Fabrication 49 - Salvage Yard, including automobile wrecking	176 Cherry Street	Onsite	PCBs, VOCs, PAHs, PHCs, metals, phenols (ABNs) (if foundry sand)	None	None	No sample locations associated with APEC
APEC-021	Former Can Company - 1976 FIP shows the Continental Can Company of Canada Limited located on the south side of Polson Street.	34 - Metal Fabrication	1 - 63 Polson Street	Onsite	Metals	None	None	No sample locations associated with APEC
APEC-022	Former Paperboard Manufacturing - 1935 and 1951 FIPs show Dominion Boxboards Limited (1935) and Gair Co. Canada Limited (1951) located on the south side of Polson Street.	45 - Pulp, Paper and Paperboard Manufacturing and Processing	1 - 63 Polson Street	Onsite	Metals/inorganics	None	None	No sample locations associated with APEC
APEC-023	Vehicle Storage Area - Golder (2013) indicates that the western portion of 312 Cherry Street was historically used for intermittent storage of vehicles and tractor trailers (1970s to 1990s). An AST was reportedly used for refuelling activities.	11 - Commercial Trucking and Container Terminals 28 - Gasoline and Associated Products Storage in Fixed Tanks	312 Cherry Street	Onsite	PHCs, BTEX, PAHs, metals (lead)	pH, PAHs, VOCs, metals/inorganics, PHCs	pH, PAHs, VOCs, metals/inorganics, PHCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-024	Former Rail Spurs - Golder (2013) indicates that a railway line was located to the east of 312 Cherry Street and that spurs extended onto the property.	46 - Rail Yards, Tracks and Spurs	312 Cherry Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-025	Transformer Use - Golder (2013) reports the presence of a pad-mounted transformer (1,817 L) located north of the office building at 312 Cherry Street. A 2004 inspection report reviewed by Golder indicated the transformer oil PCB concentration is approximately 27 ppm .	55- Transformer Manufacturing, Processing and Use	312 Cherry Street	Onsite	PCBs, PHCs, VOCs	None	None	No sample locations associated with APEC
APEC-026	Ship Docking Areas - Golder (2013) reports that docking areas on the north, west, and south sides of 312 Cherry Street may have been used by Century Coal for the storage and transfer of coal. SLR (2009) reports that the property was used as a foundry yard and ship dockage from 1912 to 1917.	44 - Port Activities, including Operation and Maintenance of Wharves and Docks	312 Cherry Street	Onsite	PHCs, metals, PAHs, phenols (ABNs) (if foundry sand)	None	None	No sample locations associated with APEC
APEC-027	Former Rail Spurs - ran from the west between Villiers and Commissioners Streets to the northeast corner of 165 Villiers (Golder, 1992a). The property at 10 Munition Street has been historically used for a railway right of way to access 309 Cherry Street (CH2M, 2008b). FIPs from 1935 and 1951 show a rail spur entering the property at 16 Munition Street from the north and running along the west side of the building (Golder, 2013). 1935 FIP shows a rail spur entering 54 Commissioners along the centre of the northern property boundary and terminating at the rear of the building; 1935 FIP shows a rail spur entering 54 Commissioners along the centre of the northern property boundary and terminating at the rear of the building(Golder, 2013; Golder, 2014). FIPs from 1935 and 1951 show a rail spur entering the property at 2 Villiers Street from the southeast corner (Golder, 2013).	46 - Rail Yards, Tracks and Spurs	Between Commissioners and Villiers Streets	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	pH, ABNs, PAHs, VOCs, metals/ inorganics, PHCs	ABNs, PAHs, VOCs, metals/inorganics, PHCs	Not all COCs have been captured by current or historical sampling activities. OC Pesticides and chlorophenols not currently analyzed for in soil or groundwater.
APEC-028	Solvent Recovery Operations - Anachemicia Chemicals, a solvent recovery company, had an oil fired boiler house, and four storage tanks located between the rail spurs on 165 Villiers Street. Waste products were received in 45 gallon drums and typically included mineral spirits, Shellsol and Varsol.	28 - Gasoline and Associated Products Storage in Fixed Tanks 51 - Solvent Manufacturing, Processing and Bulk Storage 58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	165 Villiers Street	Onsite	VOCs, PHCs, PAHs, PCBs, metals	PAHs, VOCs, inorganics/metals, PHCs	ABNs, PAHs, VOCs, OCP, metals/ inorganics, PHCs	Not all COCs have been captured by current or historical sampling activities. PCBs not currently analyzed for in soil or groundwater.
APEC-029	Grease Building - an "open grease building" was indicated along the rail spur on a 1955 site plan for Fielding Chemicals Limited. The DCS report (2006a) indicated that a previous Golder report noted the building to be present from 1954 to 1966.	NA	150 Commissioners / along Rail Spur	Onsite	VOCs, BTEX, PHCs	None	None	No sample locations associated with APEC
APEC-030	Former Coal Storage - Anthracite Briquette Company manufactured coal briquettes on 150 Commissioners Street beginning in 1919, and a coal shed was indicated on the southern portion of the property.	NA	150 Commissioners	Onsite	PAHs, Metals	ABNs, PAHs, VOCs, OCP, metals/ inorganics, PHCs	ABNs, OCP, PAHs, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil however not all COCs have been captured for groundwater. Metals are not currently analyzed for in groundwater.
APEC-031	Imported Fill - Land reclamation occurred in the area in approximately 1913 to 1917. Material was dredged from the east end of the Toronto Harbour into the Ashbridges Bay area.	30 - Importation of Fill Material of Unknown Quality	Study Area south of Keating Channel	Onsite	metals/inorganics, PAHs, PHCs	ABNs, PAHs, VOCs, OCP, Inorganics, metals, PHCs, pH, PCB, ortho-phosphate	ABNs, PAHs, VOCs, OCP, Inorganics, Metals, PHCs, pH, SVOC, PCB	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-032	Potential USTs - Two diesel USTs located east of the former building on 105 Villiers street identified in the Phase II ESA by Golder (1992). An area of 1,200 cubic meters was estimated to be impacted. The diesel tanks were removed from the site in November 1996. Strong odours were present in the soils surrounding the tanks but no evidence of visible product and no soils were removed. Verification samples (6) were below Table B industrial/commercial criteria.	28 - Gasoline and Associated Products Storage in Fixed Tanks	105 Villiers	Onsite	BTEX, PHCs, PAHs	Inorganics/metals, PAHs, PHCs, VOCs	Inorganics/metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-033	Potential USTs and AST - Four USTs were identified: two gasoline USTs in the west end of the 105 Villiers courtyard, and two fuel oil USTs on the east side of the 105 Villiers building (one within the building footprint and one just outside). The UST outside the east side had an estimated capacity of 250 gallon, the other UST sizes are unknown. One fuel oil AST was identified in the southeast corner of the 105 Villiers courtyard; size of the tank is 1000 gallons. Investigations conducted by Adamas and DCS have indicated the soil in the area of these tanks have been impacted with PHCs and BTEX due to filling operations and/or leaks from tanks. Geophysical surveys conducted by DCS (1997) could not confirm the presence of the USTs in the west end of the courtyard. The two USTs on the east side of 105 Villiers building were removed in December 1996. No evidence of grossly contaminated soils were observed; verification soil samples (9) were below Table B industrial/commercial criteria and the excavation was backfilled.	28 - Gasoline and Associated Products Storage in Fixed Tanks	105 Villiers	Onsite	PHCs, BTEX, metals (lead)	Inorganics/metals, PAHs, PHCs, VOCs, ABNs, OCPs, pH	Inorganics/metals (incl. lead), PAHs, PHCs, VOCs/BTEX, ABNs, OCPs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-034	Ship Repairs - Two ship repair companies listed in City Directories for the years 1960 to 1976. DCS (2002b) indicated that these operations were conducted out of the buildings located on the southern property boundary of 80 Commissioners Street.	7 - Boat Manufacturing	80 Commissioners Street	Onsite	Metals, PHCs, VOCs	None	None	No sample locations associated with APEC
APEC-035	UST - An unused UST was located north of the building located in the southwestern corner of 80 Commissioners Street. DSC (2002b) measured product within the tank and estimated it's capacity as less than 4,500-L.	28 - Gasoline and Associated Products Storage in Fixed Tanks	80 Commissioners Street	Onsite	PHCs, VOCs, metals (lead)	None	None	No sample locations associated with APEC
APEC-036	Potential USTs, Oil/Water Separator - three potential fuel oil USTs were identified on the east side of the building at 105 Villiers Street; two USTs were 240 gallons and the third was 2000 gallons. Geophysical surveys conducted by DCS (1997) could not confirm the presence of these USTs, and investigations uncovered an oil water separator in the vicinity. The oil/water separator was removed November 1996, and a small amount of grossly contaminated soils were excavated (no volume indicated). 5 Verification samples were below Table B industrial/commercial criteria and the excavation was backfilled.	28 - Gasoline and Associated Products Storage in Fixed Tanks	105 Villiers	Onsite	PHCs, BTEX, PAHs	None	None	No sample locations associated with APEC
APEC-037	Former UST - a 2000 gallon fuel oil UST was identified on the west side of the building at 155 Villiers Street; the UST was removed in December 1996 and the tank was noted to be rusted with perforations. Free product was observed on the groundwater infiltrating into the excavation, and grossly contaminated soil was excavated for disposal (volume not indicated). An extraction well was installed in June 1997.	28 - Gasoline and Associated Products Storage in Fixed Tanks	155 Villiers Street	Onsite	BTEX, PHCs, PAHs	None	None	No sample locations associated with APEC
APEC-038	Former UST - a 2000 gallon fuel oil UST was identified on the north side of the building at 150 Commissioners Street; the UST was removed in November 1996 and the tank was noted to be rusted with perforations. No evidence of grossly contaminated soils were observed; verification soil samples (3) were below Table B industrial/commercial criteria and the excavation was backfilled.	28 - Gasoline and Associated Products Storage in Fixed Tanks	150 Commissioners	Onsite	BTEX, PHCs, PAHs	Inorganics/metals, PAHs, PHCs, VOCs, PCBS	Inorganics/metals, VOCs, PCBS	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil however not all COCs have been captured for groundwater. PAHs and PHCs are not currently analyzed for in groundwater.
APEC-039	Former UST - a 1000 gallon "dirty Varsol" UST was reported located on the north end of the building at 155 Villiers Street. The UST was removed in November 1996 and very strong solvent odours were present in the soils surrounding the tank including a visible sheen. The sidewalls of the excavation were advanced until the sheen was no longer observed. An approximate 80 m^2 area was excavated to a depth ranging from 2.5 to 2.7 mbgs. Seven verification soil samples were collected, two samples (on the north and west wall at 1.5 mbgs) indicated xylene concentrations above Table B industrial/commercial criteria with concentrations of 150 ppm and 128 ppm.	28 - Gasoline and Associated Products Storage in Fixed Tanks	155 Villiers Street	Onsite	BTEX, PHCs, VOCs	Inorganics/metals (lead)	None	No COCs have been captured by current or historical sampling activities for soil. No groundwater sampling completed at APEC.
APEC-040	Potential USTs - one fuel oil UST was identified within the building footprint at 155 Villiers, size of tank is unknown, Geophysical surveys conducted by DCS (1997) were not able to confirm the location/presence.	28 - Gasoline and Associated Products Storage in Fixed Tanks	155 Villiers Street	Onsite	BTEX, PHCs, PAHs	None	None	No sample locations associated with APEC

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-041	Former AST - two fuel oil ASTs were identified south of the building at 155 Villiers Street. Tanks had a capacity of 500 gallons.	28 - Gasoline and Associated Products Storage in Fixed Tanks	155 Villiers Street	Onsite	BTEX, PHCs, PAHs	None	None	No sample locations associated with APEC
APEC-042	Former UST - a 1000 gallon fuel oil UST was removed in November 1996. No grossly contaminated soils were observed; verification soil samples (4) were below Table B industrial/commercial criteria and the excavation was backfilled.	28 - Gasoline and Associated Products Storage in Fixed Tanks	165 Villiers Street	Onsite	BTEX, PHCs, PAHs	Inorganics/metals (not all O.Reg. 153/040 metals included), ortho-phosphate	None	No COCs have been captured by current or historical sampling activities for soil. No groundwater sampling completed at APEC.
APEC-043	Chemical Storage - Fielding & Sons (Later Fielding Chemicals Limited - Naval Stores and Heavy Chemicals) were brokers and dealers of a variety of products including spirits of turpentine and glues to soap powder and poultry netting. They occupied the property at 165 Villiers from approximately 1919 to approximately 1964.	NA	165 Villiers Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	ABNs, OCP, PAHs, PHCs, VOCs, pH, metals/inorganics	ABNs, OCP, PAHs, PHCs, VOCs, pH, metals/inorganics	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-044	Smith Transport Warehousing - The Adamas report indicated the building on 150 Commissioners to be used for offices and sheds to support the transport business from 1935, but added warehousing in 1939 on the eastern end.	NA	105 Villiers	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Inorganics/metals, PAHs, PHCs, VOCs	Inorganics/metals (not all O.Reg. 153/04 metals are included), VOCs, pH	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil however not all COCs have been captured for groundwater. Some metals have not been analyzed for in groundwater.
APEC-045	Smith Transport Trailer Repair Shop - Smith Transport was a transport business; the building on the 155-165 Villiers property was built sometime after 1964 for the repair of trailers.	NA	155-165 Villiers Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Inorganics/metals, PAHs, PHCs, VOCs, pH	Inorganics/metals, PAHs, PHCs, VOCs, pH, ABNs, OCP	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-046	Smith Transport Warehousing - The Adamas report indicated the building on 150 Commissioners to be used for warehousing. Smith Transport occupied this site from approximately 1949, and initially used it for temporary truck parking.	NA	150 Commissioners	Onsite	VOCs, PHCs, metals/inorganics, PAHs	Inorganics/metals, PAHs, PHCs, VOCs, ABNs, OCP, PCBs, SVOCs, pH	Inorganics/metals, PAHs, PHCs, VOCs, ABNs, OCP, PCBs, SVOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-047	Electrical Substation - Toronto Hydro operated an electrical substation at 281 Cherry Street from the 1920s to approximately 1995.	18 - Electricity Generation, Transformation and Power Stations	281 Cherry Street	Onsite	PCBs, PHCs, VOCs	ABNs, Inorganics/metals, PHCs, PCBs, VOCs, pH	ABNs, Inorganics/metals, PHCs, PCBs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-048	Former Transformer Use - CH2M (2008) and OHE (2011) reports that up to two transformers were formerly located in the southeast corner of the building at 281 Cherry Street.	55 - Transformer Manufacturing, Processing and Use	281 Cherry Street	Onsite	PCBs, PHCs, VOCs	None	None	No sample locations associated with APEC.
APEC-049	Commercial Refrigeration Manufacturer - Commercial refrigeration equipment has been manufactured, serviced, or both at 65 Villiers Street, from approximately the 1920s to the present. FIPs from 1935 and 1951 show coal storage, a garage, a woodworking building, and a welding room.	34 - Metal Fabrication	65 to 95 Villiers Street	Onsite	Metals, PHCs, VOCs, PAHs	None	None	No sample locations associated with APEC.
APEC-050	UST - DCS (2002b) reports the presence of an oil UST within the main building at 65 Villiers Street based on information received from the TSSA.	28 - Gasoline and Associated Products Storage in Fixed Tanks	65 to 95 Villiers Street	Onsite	PHCs, PAHs, BTEX	None	None	No sample locations associated with APEC.
APEC-051	Port Uses - City Directories indicate that 62 Villiers Street has been used by the Toronto Harbour Commissioners from at least the late 1920s for port uses. Use of this property as a Dry Dock was listed in the City Directories for 1927 only (the first year available for review).	44 - Port Activities, including Operation and Maintenance of Wharves and Docks	62 Villiers Street	Onsite	PHCs, VOCs, metals, PAHs	Inorganics/metals, PAHs, PHCs, VOCs, pH, PCBs	Inorganics/metals, PAHs, PHCs, VOCs, pH	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-052	Former Coal Storage - Based on City Directories and FIPs, Milnes Coal Co. operated from 2 Villiers Street from at least 1927 to 1935.	NA	2 Villiers Street	Onsite	PAHs, metals	Inorganics/metals, PAHs, PHCs, VOCs, pH	Inorganics/metals, PAHs, PHCs, VOCs, pH	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-053	Former Gas Station - EcoLog ERIS reports the presence of a British American Oil Co. Ltd. service station located at 309 Cherry Street which had one 1,514-L gasoline UST and three 3,785-L gasoline USTs in 1934.	28 - Gasoline and Associated Products Storage in Fixed Tanks	309 Cherry Street	Onsite	PHCs, BTEX, metals (lead)	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs, PCBs	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs, PCBs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-054	Former Bulk Fuel Storage - McColl Bros./McColl Frontenac Oil Co. Ltd. at 309 Cherry Street is listed in EcoLog ERIS to have been a petroleum bulk storage site with tanks containing several hundred thousand litres of petroleum and crude oils for the years 1925 and 1930. Bulk fuel storage was conducted at the property from approximately 1938 to the 1990s. SLR (2014) reports that a 1987 Golder report indicates the presence of PHC contaminated at the property to a depth of 4 mbgs. Floating product ranging in thickness between 0.15 and 0.7 m was historically found in monitoring wells located in the centre of the property.	28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	309 Cherry Street	Onsite	PHCs, BTEX, PAHs, metals	Inorganics/metals, PAHs, PHCs, VOCs, pH, PCBs, ABNs	Inorganics/metals, PAHs, PHCs, VOCs, pH, PCBs, ABNs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-055	Former Oil Recycling - AquaTech Blue Ltd. operated an oil recycling facility at 309 Cherry Street. The company was fined over $700,000 in August, 2000 for allowing the discharge of PHCs from this property to the Keating Channel. EcoLog ERIS reports that this property has PCB-containing equipment and stores PCBs (1999 and 2000). EcoLog ERIS reports several spills and explosive vapour readings in storm sewers between the years 1994 to 1999, which are associated with AquaTech Blue's use of the property.	16 - Crude Oil Refining, Processing and Bulk Storage	309 Cherry Street	Onsite	PHC, BTEX, PAHs, PCBs, VOCs, metals/inorganics	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs, PCBs	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs, PCBs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-056	Waste Processing - Quantex Technologies has operated a waste transfer/processing facility at 309 Cherry Street from approximately 1999 to the present. EcoLog ERIS reports several spills for years between 2000 and 2011, which are associated with Quantex's use of the property.	58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	309 Cherry Street	Onsite	PHC, BTEX, PAHs, PCBs, VOCs, metals/inorganics, OC pesticides	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs, PCBs	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs, PCBs	Not all COCs have been captured by current or historical sampling activities. OC Pesticides not currently analyzed for in soil or groundwater.
APEC-057	USTs - EcoLog ERIS reports that the Toronto Port Authority operated a private fuel outlet at 62 Villiers Street between 2007 and 2011. The property is listed as having two USTs, one for gasoline and one for diesel (4,500 L each), both installed in 1989.	28 - Gasoline and Associated Products Storage in Fixed Tanks	62 Villiers Street	Onsite	PHCs, BTEX, metals (lead)	pH, inorganics/metals, PAHs, PHCs, VOCs, PCBs	pH, inorganics/metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-058	Oil Storage - SLR (2009) reports that 2 Villiers Street was used for oil storage from approximately 1940 to 1950.	16 - Crude Oil Refining, Processing and Bulk Storage	2 Villiers Street	Onsite	PHCs, BTEX, PAHs, metals	pH, inorganics/metals, PAHs, PHCs, VOCs	pH, inorganics/metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-059	Coal Gasification Plant - The Consumers Gas Company appears on FIPs from 1913 and 1924, and aerial photographs from 1947 at the southwestern corner of Eastern and Booth Avenues.	9 - Coal Gasification	Southwestern corner of Eastern and Booth Avenues	Onsite/Off site	PHCs, BTEX, PAHs, VOCs, metals	None	None	No sample locations associated with APEC
APEC-060	Bulk Tank Farm - 1913 and 1924 FIP show a bulk tank farm on the north side of the Keating Channel on the east side of Cherry Street. The company name is not labelled in 1913, but is listed as the British North American Oil Company in the 1924 FIP. The structures/tanks associated with this property extend east to the Don River on the 1924 FIP. The tank farm, extending west from Cherry Street, south to the Keating Channel, north to the railway lines, and east to the Don River, is visible on aerial photographs until 1971. A 1983 aerial shows that all of the large ASTs have been removed from this property.	28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	Northeastern corner of Cherry Street and Keating Channel, west to Don River	Onsite/ Offsite	PHCs, VOCs, PAHs, metals	ABNs, PAHs, VOCs, CP, OCP, metals/ inorganics, PHCs, pH, PCB	ABNs, PAHs, VOCs, CP, OCP, metals/ inorganics, PHCs, pH, PCB, metals	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-061	Railway Main Lines/Yard - Grand Trunk Railway lines are shown on the 1913 and 1924 FIPs. These railway lines are still in place based on current aerial mapping.	46 - Rail Yards, Tracks and Spurs	North of Keating Channel, west of Don River	Onsite/ Offsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	Selenium	No COCs have been captured by current or historical sampling activities.
APEC-062	Iron Manufacturing - 1913 and 1924 FIPs show the National Iron Corporation Limited on a parcel of land located at the northwestern corner of Cherry Street on the north side of the Keating Channel, extending west to Parliament Street.	32- Iron and Steel Manufacturing and Processing	Northwestern corner of Cherry Street and Keating Channel	Onsite/ Offsite	Metals, PAHs, phenols (ABNs) (if foundry sand), PHCs	None	None	No sample locations associated with APEC
APEC-063	Soap Manufacturing - 1903, 1913, and 1924 FIPs shows the Sunlight Soap Works plant. Expansion to the main plant building is evident in the FIPs over the years, as is the construction of additional buildings.	50 - Soap and Detergent Manufacturing, Processing and Bulk Storage	South of Eastern Avenue, west of Don River, north of CNR Rail lines	Offsite	pH, SAR	None	None	No sample locations associated with APEC

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-064	Former Coal Storage - 1958 FIP indicates that Canada Coal Ltd. occupied 238 Cherry Street.	NA	238 Cherry Street	Onsite	Metals, PAHs	None	None	No sample locations associated with APEC
APEC-065	Former USTs/ASTs - EcoLog ERIS report cited in Golder (2013) indicated the presence of a 757-L tank of gasoline from 1919 and 1928 and a 378-L tank of gasoline in 1921 at 256 Cherry Street associated with Century Coal Ltd.	28 - Gasoline and Associated Products Storage in Fixed Tanks	256 Cherry Street	Onsite	PHCs, BTEX, metals (lead)	pH, inorganics/ metals, PAHs, PHC, VOC	pH, inorganics/ metals, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-066	Former Marine Terminal - According to City Directories, portions of 242 Cherry Street were used as a marine terminal/wharf from approximately 1925 to 1982.	44 - Port Activities, including Operation and Maintenance of Wharves and Docks	242 Cherry Street	Onsite	PHCs, VOCs, metals, PAHs	pH, inorganics/ metals, PAHs, PHC, VOC, PCBs	pH, inorganics/ metals, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-067	Recycling and Waste Transfer Station - EcoLog ERIS report cited in Golder (2013) indicates that Turtle Island Recycling has several convictions under the Environmental Protection Act, for failure to comply with their Certificate of Approval, including illegal storage of wastes outdoors. The property is currently used as a recycling and waste transfer station operated by GFL Environmental.	58 - Waste Disposal and Waste Management, including thermal treatment, landfilling and transfer of waste, other than use of biosoils as soil conditioners	242 Cherry Street	Onsite	Metals/inorganics, PAHs, PAHs, VOCs, PCBs, PHCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil. No groundwater sampling completed at APEC.
APEC-068	Former Coal Storage - Century Coal occupied 256 and 312 Cherry Street from approximately 1932 to the late 1950s.	NA	256 and 312 Cherry Street	Onsite	Metals, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-069	Vehicle Maintenance and Storage - Golder (2014) reports that 54 Commissioners was used for personal vehicle maintenance between approximately 1995 and 2011, with vehicle storage occurring in the southwestern corner and along the western property boundary.	52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	54 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	PAHs, PHC, VOC, PCBs	None	Not all COCs have been captured by current or historical sampling activities. Metals not currently analyzed for in soil. No groundwater sampling completed at APEC.
APEC-070	Former Overhead Cranes - Crane runways/travelling cranes are depicted on both sides of the main building at 80 Commissioners on FIPs and City of Toronto drawings from 1941 and 1951. It is unknown whether these cranes were operated with hydraulics or other fuels.	NA	80 Commissioners Street	Onsite	Metals, PHCs	pH, inorganics/ metals, PAHs, PHC, VOC, PCBs, ABNs	pH, inorganics/ metals, PAHs, PHC, VOC, PCBs, ABNs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-071	Waste Drum Storage and Potential UST - DSC (2002b) reports that they had previously observed an above ground fill pipe (potentially associated with a UST) and approximately 50 drums of used oil and paint sludges "on the northern limit" of the property during a Site visit in 1992.	28 - Gasoline and Associated Products Storage in Fixed Tanks	80 Commissioners Street	Onsite	Metals, PHCs, VOCs	None	None	No sample locations associated with APEC
APEC-072	ASTs - Two fuel ASTs were located at 80 Commissioners at the time of the DSC (2002b) site visit. One (2,270-L) was located on the exterior wall of the main building (northeast side) contained waste oil and the second (2,270-L) was located inside an area where generators are stored/serviced containing new oil. A third AST containing waste antifreeze (1,820-L) was located west of the exterior waste oil AST.	28 - Gasoline and Associated Products Storage in Fixed Tanks	80 Commissioners Street	Onsite	Metals, PHCs, BTEX, glycols	None	None	No sample locations associated with APEC
APEC-073	Former AST - DSC (2002b) reports that based on a review of a 1998 subsurface investigation, an aboveground heating oil storage tank may have historically been located in the southwestern corner of 80 Commissioners. The 1998 study advanced a test pit in this area and encountered hydrocarbon impacts, which were attributed to the oil tank. DSC (2002b) reports that the tank was not present during their site visit in 2002.	28 - Gasoline and Associated Products Storage in Fixed Tanks	80 Commissioners Street	Onsite	PHCs, PHCs, BTEX	None	None	No sample locations associated with APEC
APEC-074	AST - Golder (2014b) reports the presence of a diesel AST (without secondary containment), observed along the eastern property boundary of 130 Commissioners Street.	28 - Gasoline and Associated Products Storage in Fixed Tanks	130 Commissioners Street	Onsite	PAHs, PHCs, BTEX	None	None	No sample locations associated with APEC
APEC-075	AST - Golder (2014b) reports the presence of a diesel AST (without secondary containment), observed along the southern property boundary of 130 Commissioners Street.	28 - Gasoline and Associated Products Storage in Fixed Tanks	130 Commissioners Street	Onsite	PAHs, PHCs, BTEX	None	None	No sample locations associated with APEC
APEC-076	ASTs - Golder (2014b) reports the presence of two heating oil ASTs (without secondary containment), observed external to the northeast corner of the office building at 130 Commissioners Street.	28 - Gasoline and Associated Products Storage in Fixed Tanks	130 Commissioners Street	Onsite	PHCs, PHCs, BTEX	None	None	No sample locations associated with APEC

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-077	Potential UST - Golder (2014b) reports that a UST associated with a former pump island may have been located to the west of the Scale House at 130 Commissioners Street based on previous observations made by WESA of a fill port and vent pipe. A Site representative confirmed that gasoline was once dispensed from that area.	28 - Gasoline and Associated Products Storage in Fixed Tanks	130 Commissioners Street	Onsite	PHCs, BTEX, metals (lead)	None	None	No sample locations associated with APEC
APEC-078	Scrap Metal Recycling - The property at 130 Commissioners Street has been used as a scrap metal recycling facility since the 1940s. A smelting furnace was reported to have been used to burn off the coverings and insulation from cables and wires.	49 - Salvage Yard, including automobile wrecking 34 - Metal Fabrication	130 Commissioners Street	Onsite	Metals and inorganics, VOCs, PHCs, PCBs	pH, inorganics/ metals, PAHs, PHC, VOC, PCBs, ABNs	Inorganics/metals, PAHs, PHC, VOC, PCBs, SVOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-079	Former ASTs - Golder (2014b) reports that two fuel oil ASTs were formerly present along the western exterior wall of the warehouse based on a 1979 FIP.	28 - Gasoline and Associated Products Storage in Fixed Tanks	130 Commissioners Street	Onsite	PHCs, PAHs, BTEX	None	None	No sample locations associated with APEC
APEC-080	Former ASTs - Golder (2014b) reports that a fuel oil AST was formerly present within the southwestern corner of the warehouse (washroom/change room addition) based on a 1979 FIP.	28 - Gasoline and Associated Products Storage in Fixed Tanks	130 Commissioners Street	Onsite	PHCs, PAHs, BTEX	None	None	No sample locations associated with APEC
APEC-081	Bulk Tank Farm - A 1947 aerial shows a bulk tank farm on the east side of the mouth of the Don River at the Keating Channel. It is unknown whether these tanks are associated with the British North American Oil Company tank farm located on the west side of the Don River (as shown on the 1924 FIP), or Imperial Oil tank farm located at the Don Roadway and Villiers Street (as shown on a 1951 FIP). The tank farm is not present in an 1950 aerial image, where a factory/plant and associated buildings are now visible. Prior to 1947, this parcel appeared vacant on the 1924 FIP, and as the "Gooderham & Worts cattle sheds" from 1884 to 1913.	28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	21 Don Roadway	Onsite	PHCs, VOCs, PAHs, metals	None	None	No sample locations associated with APEC
APEC-082	Machine Shop - A machine shop is shown on a 1951 FIP associated with the Toronto Dry Dock Company and one associated with the Toronto Harbour Commissioners.	34 - Metal Fabrication	62 Villiers Street	Onsite	Metals, PHCs, VOCs, PAHs	None	None	No sample locations associated with APEC
APEC-083	Bulk Tank Farm - 1951 FIP shows five bulk ASTs covering the entire southern portion of 309 Cherry Street.	28 - Gasoline and Associated Products Storage in Fixed Tanks 16 - Crude Oil Refining, Processing and Bulk Storage 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	309 Cherry Street	Onsite	PHCs, VOCs, PAHs, metals	PHCs, VOCs, ABNs, PCBs	pH, inorganics/ metals, PAHs, PHCs, VOCs, ABNs	Not all COCs have been captured by current or historical sampling activities. Metals not currently analyzed for in soil. All COCs analyzed for in groundwater.
APEC-084	Soap Manufacturing - It was reported that the Unilever Company operated out of a factory at 21 Don Roadway from the 1950s until 2012.	50 - Soap and Detergent Manufacturing, Processing and Bulk Storage	21 Don Roadway	Onsite	pH, SAR	None	None	No sample locations associated with APEC.
APEC-085	Rail Yard - A rail yard is present in current aerial photographs and those dating back to 1947.	46 - Rail Yards, Tracks and Spurs	Northeast corner Don River and Lake Shore Boulevard East	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC.
APEC-086	Repair Garage - CRA (2010) reports that the property located at 480 Lake Shore Boulevard East is current used as an automobile repair business.	10 - Commercial Autobody Shops	480 to 520 Lakeshore Boulevard East	Onsite/ Offsite	PHCs, VOCs, metals	pH, inorganics/ metals, PAHs, PHC, VOC, PCBs, ABNs, CP, OCP	inorganics/metals, PAHs, PHC, VOC, PCBs, ABNs, CP, OCP	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-087	Oil Pipeline - A Trans-Northern Pipeline meter station is located on the east side of the Don Roadway, just north of Lakeshore Boulevard East. The status and route of the pipeline in this area is not known.	36 - Oil Production	Don Roadway, north of Lake Shore Boulevard East	Onsite	PHCs, VOCs, metals, PAHs	None	None	No sample locations associated with APEC.
APEC-088	Soil Remediation Facility - Harbour Remediation & Transfer Inc. occupied 97 Commissioners Street from approximately 1994 to present.	58-Waste Disposal and Waste Management 30-Importation of Fill Material of Unknown Quality	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil. No groundwater sampling completed at APEC.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-089	Former UST - Former UST, diesel pump and vent pipe reported by Dames & Moore (1994) to be present on the east portion of 97 Commissioners Street property, immediately south of the office building. At the time the report was written, the UST had been removed; the fuel pump was still present onsite.	28 - Gasoline and Associated Products Storage in Fixed Tanks	97 Commissioners Street	Onsite	PHCs, PAHs, BTEX	None	None	No sample locations associated with APEC.
APEC-090	Waste and Chemical Product Storage - Dames & Moore (1994) reported nine 500 gallon storage drums grouped together at 97 Commissioners Street. Three drums were rusted and empty; one was full without a label; one was half full and in good condition labelled "Texaco multigrear EP". Rusted metal pipes were stored next to the drums. The location of the drum storage area is unclear as the report text described the area to be on the east side of the property while the appended photo describes the area to be present along the west property boundary. Both areas have been included on the PCA/APEC map.	58-Waste Disposal and Waste Management	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	None	None	No sample locations associated with APEC.
APEC-091	Former ASTs/Storage Silos-Three large storage silos/ASTs were present on the southeast portion of 97 Commissioners Street; one was reported to be used as a water storage tank, the contents of the remaining two ASTs are unknown. Asphalt and concrete secondary containment berms were present around the tanks. All tanks were empty at the time of the D&M investigation.	28 - Gasoline and Associated Products Storage in Fixed Tanks	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	None	None	No sample locations associated with APEC.
APEC-092	Former ASTs/Storage Silos - Two storage silos/ASTs were present immediately south of the processing building (larger building) on 97 Commissioners Street. The contents of the two ASTs are unknown. Asphalt and concrete secondary containment berms were present around the tanks. All tanks were empty at the time of the D&M investigation.	28 - Gasoline and Associated Products Storage in Fixed Tanks	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	None	None	No sample locations associated with APEC.
APEC-093	Transformer Station - Dames and Moore (1994) reported the presence of a transformer station on the west side of the processing building at 97 Commissioners Street enclosed in a chain-link fence. Aerial photographs from the early 1970s indicated the presence of the transformer station however no date was visible on the outside transformer during the D&M site visit. It was not confirmed whether the transformer contained PCBs.	55-Transformer Manufacturing, Processing and Use	97 Commissioners Street	Onsite	PCBs, PHCs, VOCs	None	None	No sample locations associated with APEC.
APEC-094	Oil Separator - D&M (1994) reported the presence of a two stage oil separator along the north wall of the processing building (larger building). A monitoring well was discovered by D&M in this area which contained Waterra tubing covered in residual diesel oil and water removed from the well had a black oily sheen and strong hydrocarbon odour.	28 - Gasoline and Associated Products Storage in Fixed Tanks	97 Commissioners Street	Onsite	PHCs, PAHs, BTEX	None	None	No sample locations associated with APEC.
APEC-095	Former AST - Dames and Moore (1994) reported the presence of a former AST along the western boundary of 97 Commissioners Street.	28 - Gasoline and Associated Products Storage in Fixed Tanks	97 Commissioners Street	Onsite	VOCs, PAHs, PHCs	None	None	No sample locations associated with APEC.
APEC-096	Rusted scrap metal parts and pile of metal pipes-Dames and Moore (1994) reported an area at the northwest corner of the processing building with a variety of rusted scarp metal parts and a pile of metal pipes.	49-Salvage Yard, including automobile wrecking	97 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs, PCBs	None	None	No sample locations associated with APEC.
APEC-097	Former Rail Spurs - Figure included in the Dames and Moore (1994) report shows a rail spur entering 97Commissioners along the centre western property boundary and terminating at the middle of the south property boundary. Based on current aerials of the site, the rail spurs no longer appear to be present.	46-Rail Yards, Tracks and Spurs	97 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Not all COCs have been captured by current or historical sampling activities. OC Pesticides and chlorophenols not currently analyzed for in soil or groundwater.
APEC-098	Artillery Shell Manufacturing - DSC (2000, 2009) and Golder (1991) reported that the property south of Commissioners Street were used for artillery shell manufacturing by British Forgings Limited during the First World War.	20-Explosives and Ammunition Manufacturing, Production and Bulk Storage	51, 75, 85, 99, 99a Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-099	Bulk Tank Farm - According to DSC (2009) 75 Commissioners (formerly 85 Commissioners before being severed) was used as a bulk fuel storage tank farm by McColl Frontenac from approximately 1949 to 1964.	28-Gasoline and Associated Products Storage in Fixed Tanks	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-100	Tractor Trailer Parking - Canadian Pacific Express used this 75 Commissioners Street for tractor trailor parking purposes (1964-1988) before it was severed from 85 Commissioners Street (DCS, 2000).	52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-101	Solid Waste Recycling Operation - DCS (2009) reported that Harkow Recycling and Aggregates operated a waste recycling facility at 75 Commissioners Street (1994-1999). According to Terrapex (2009) 75 Commissioners Street was listed from United Rentals and SP Canadian Film Production Inc. for a variety of wastes such as aromatic and aliphatic solvents, petroleum distillates, light fuels, waste oils & lubricants, crankcase oils, and paint, pigment and coating residues from 2001-2009.	58 - Waste Disposal and Waste Management	75 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-102	Heavy Equipment Rental Company - DCS (2000) reported that United Rentals, a heavy equipment rental company, leased the north portion of the 75 Commissioners Street property from 2000 to present. The portion of the site leased was to be used as an office and equipment yard used for storage maintenance and refuelling purposes.	52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems 11 - Commercial Trucking and Container Terminals	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-103	Chemical Storage - DCS (2000) reported the presence of waste materials such as waste oils, hydraulic oils, xylene, gas cylinders, paint, grease in the work bay in the northern portion of the north building present at 75 Commissioners Street during their investigation in 2000. Staining of floor surfaces (oil and grease covered an 120 m2 area) and product release stains were also noted during DCS (2000) investigation.	8 - Chemical Manufacturing, Processing and Bulk Storage 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	None	None	No sample locations associated with APEC.
APEC-104	ASTs - Noted in the Terrapex (2009) report the presence of ASTs/jerry can along the eastern boundary of 75 Commissioners.	28 - Gasoline and Associated Products Storage in Fixed Tanks	75 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-105	Tank Farm - DSC (2009) reported that the property at 85 Commissioners Street was used for bulk fuel storage tank farm by McColl Frontenac (1964-1988).	28 - Gasoline and Associated Products Storage in Fixed Tanks	85 Commissioners Street	Onsite	PHC, metals/inorganics, PAHs, VOCs, BTEX	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-106	Truck Storage - DSC (2009) reported that the fuel storage tank farm was removed from the property at 85 Commissioners Street. Both 85 and 95 Commissioners Street were subsequently used for truck storage by Canadian Pacific Express and Transport .	52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	85 and 95 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-107	Imported Fill - DSC (2009) reported the presence of a small berm of fill material along the south portion of 85 Commissioners Street.	30 - Importation of Fill Material of Unknown Quality	85 Commissioners Street	Onsite	Metals/inorganics, PAHs, PHCs	None	None	No sample locations associated with APEC.
APEC-108	Lead Paint and Piping - Terrapex (2009) reported that painted surface with suspected lead based paints or solder joints of drain piping were present onsite.	NA	85 Commissioners Street	Onsite	Metals (Lead)	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-109	Solid Waste Recycling Operation - DCS (2009) reported that Consolidated Fibres operated a wood and paper recycling operation on 95 Commissioners Street between 1972-1985/86. Plymouth Paper Products was also noted to be present at 95 Commissioners during this period. DCS (2009) reported the presence of various waste recycling facilities including First Canadian Recycling Ind. Ltd, Quno Recycling Corp and Donohue Recycling Inc. during the period of 1989 to 2005. Wastes noted to be present on site include waste oils and lubricants, paint, pigment, coating residues, polymeric resins, oil skimmings and sludges. Both 85 and 95 Commissioners were listed with a CoA for waste disposal transfer station under Harkow Recycling Ltd. in 1998 and 1999.	58 - Waste Disposal and Waste Management 45 - Pulp, Paper and Paperboard Manufacturing and Processing	85 and 95 Commissioners Street	Onsite	PHC, metals/inorganics, PAHs, VOCs, BTEX	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-110	Transformers - Fluorescent light fixtures, floor and wall mounted transformers were noted by Terrapex (2009) in the industrial building on 95 Commissioners Street.	55 - Transformer Manufacturing, Processing and Use	95 Commissioners Street	Onsite	PCBs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	None	Not all COCs have been captured by current or historical sampling activities. PCBs not currently analyzed for soil. No groundwater sampling completed at APEC.
APEC-111	Potential Former AST- Terrapex (2009) noted that a 1991 Golder report discussed the presence of a 2,250 L AST containing diesel fuel located in the loading dock area of 95 Commissioners Street for refuelling front end loaders. The site was listed as a private fuel outlet under Quebec and Ontario Paper Recycling Ltd.	28 - Gasoline and Associated Products Storage in Fixed Tanks	95 Commissioners Street	Onsite	PHCs, PAHs, BTEX	pH, inorganics/ metals, PAHs, PHC, VOCs	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil. No groundwater sampling completed at APEC.
APEC-112	Former USTs - Terrapex (2009) noted the presence of a 9,000 L UST present in the southwest corner of 95 Commissioners Street. The UST was installed in 1974 and reportedly removed in 1993. A single wall UST containing diesel fuel was reportedly installed at 95 Commissioners in 1993. Terrapex (2009) noted that it was unclear as to whether there was one or two USTs associated with 95 Commissioners Street.	28 - Gasoline and Associated Products Storage in Fixed Tanks	95 Commissioners Street	Onsite	BTEX, PHCs, PAHs, metals	None	None	No sample locations associated with APEC
APEC-113	Rail Spurs - According to Terrapex (2009), a CN rail spur line was present at the east side of the industrial building on 95 Commissioners Street.	46-Rail Yards, Tracks and Spurs	95 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC.
APEC-114	Used Rubber Recycling-DSC (2009) reported that National Rubber Technologies (used rubber recycler) was present on 99 Commissioners Street from 1993 until the year the report was written in 2009.	47-Rubber Manufacturing and Processing	99 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-115	Rail Spurs - According to DCS (2009), rail tracks associated with the former British Forging operation formerly traversed the north portion of 99 Commissioners Street.	46 - Rail Yards, Tracks and Spurs	99 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC.
APEC-116	Chemical Storage - DCS (2009) reported the presence of a chemical storage enclosure on 99 Commissioners Street used to contain waste materials, 4,500L diesel fuel tank (appears to be in an AST) for NRT vehicles and lubricating oils, located along the west fence line south of the main building. Stained areas were observed on the adjacent concrete refuelling pad to the east of the enclosure during the DCS (2007) investigation. The diesel AST was constructed of steel and placed within a steel containment structure which was surrounded by a low concrete containment wall. No staining due to fuel spillage was observed around the storage tank however 15 cm of fuel was present at the base of the steel containment unit.	8 - Chemical Manufacturing, Processing and Bulk Storage 52 - Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems	99 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-117	Oil water separator - DSC (2009) reported that an oil water separator was present in the northcentral portion of the main building on the 99 Commissioners Street Property. Oil skimmings are pumped directly from the oi/water separator into a disposal truck.	58 - Waste Disposal and Waste Management	99 Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs	None	None	No sample locations associated with APEC.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-118	Used Rubber Manufacturing Plant - DCS (2009) reported that the main building on the 99 Commissioners Street property is used solely for the storage and recycling of used vehicle tires. The southern half of the building serves as the receiving and storage area for the tires. The northern half of the building is occupied by several tire shredding lines, product storage and a maintenance shop. Process equipment used to melt shredded tire material (crumb) was also located in the north half of the building.	47 - Rubber Manufacturing and Processing	99 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil. No groundwater sampling completed at APEC.
APEC-119	Transformer Compound - DCS (2007) noted during their investigation that a transformer compound was present on the north west side of the main building on 99 Commissioners Street. DSC (2007) noted during their investigation that no equipment suspect of containing PCBs was observed as the main building was constructed 13 years after the federal ban on PCBs in new equipment.	55 - Transformer Manufacturing, Processing and Use	99 Commissioners Street	Onsite	PCBs, PHCs, VOCs	None	None	No sample locations associated with APEC.
APEC-120	Fuel and Coal Storage-DCS(2009) reported that the 99A Commissioners Street was used for coal storage by Regal Coal Co. Ltd and fuel storage by Supertest Petroleum Co. Ltd between 1949 and 1961.	52-Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems NA	99a Commissioners Street	Onsite	VOCs, BTEX, PHCs, PAHs, metals	pH, inorganics/ metals, PAHs, PHC, VOCs	pH, inorganics/ metals, PAHs, PHC, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-121	Waste Processing Activities - DCS (2009) reported that 99 Commissioners Street was used by Harkow Aggregates for waste processing activities sometime after 1978 until 1989. During Harkow's occupancy of the property, a larger sized building was located within the south western part of the site with a smaller building in the northeast part of the site.	58 - Waste Disposal and Waste Management	99a Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-122	Waste/Debris Piles - DSC (2009) reported that 99A Commissioners Street was vacant from approximately 1989 until the time their report was written and that numerous piles (one as high as 10 m) of brick, concrete and intermixed debris have been deposited on a majority of the site footprint, which has significantly reduced access to much of this property.	12 - Concrete, Cement and Lime Manufacturing 58 - Waste Disposal and Waste Management	99a Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs, pH	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-123	Former Tank Farm - Based on 1935 and 1951 FIPs and City Directories, Terrapex (2009) reported that the property at 225 Commissioners Street (formerly 101 Commissioners) was used as bulk fuel storage tank farm by Imperial Oil Ltd (mid 1930s-1980). 1935 FIP shows two 3,000,000 gal ASTs (oil tanks); 1953 aerial photo showed approximately 12 ASTs, 1951 FIP indicated 6 of these were 350,000-850,000 gal ASTs.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	225 Commissioners (formerly 101 Commissioners)	Onsite	PHCs, BTEX, PAHs	pH, metals/ inorganics, PAHs, PHC, VOC	pH, metals/ inorganics, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-124	Former Holding Pond - Based on a 1965 aerial photo (Terrapex, 2009), there appears to be a holding pond present in the southwest portion of 225 (formerly 101) Commissioners Street.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage 58 - Waste Disposal and Waste Management	225 Commissioners (formerly 101 Commissioners)	Onsite	PHCs, BTEX, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil. No groundwater sampling completed at APEC.
APEC-125	Rail Sidings - According to the 1951 FIPs (Terrapex, 2009) rail sidings were present on north porton of 225 (former 101) Commissioners Street.	46 - Rail Yards, Tracks and Spurs	225 Commissioners (formerly 101 Commissioners)	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC
APEC-126	Rail Sidings - According to the 1951 FIPs (Terrapex, 2009) rail sidings were present south porton of 185 Villiers Street.	46 - Rail Yards, Tracks and Spurs	185 Villiers Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC.
APEC-127	Former Fuel Oil Tank Farm - According to the 1951 FIP (Terrapex, 2009), Imperial Oil Ltd Bulk Plant had 6 steel ASTs ranging in size from approximately 2,000,000-3,000,000 gal on 185 Villiers Street.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	185 Villiers Street	Onsite	PHCs, BTEX, PAHs	pH, metals/ inorganics, PAHs, PHC, VOC	pH, metals/ inorganics, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-128	Former Fuel Oil Tank Farm - According to a 1951 FIP (Terrapex, 2009) Imperial Oil Ltd has 3 former fuel oil ASTs raning from approximately 1,000,000-2,000,000 gal at 625-675 Lake Shore Boulevard.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	625-675 Lake Shore Boulevard	Onsite	PHCs, BTEX, PAHs	pH, inorganics/ metals, PAHs, PHCs, VOCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-129	Former Coal Tar Distillation - According to the 1951 FIP (Terrapex, 2009), The Barrett Co. used this property at 685 Lake Shore Boulevanrd for distilling of crude cola tar and saturating roofing felt.	9 - Coal Gasification	685 Lake Shore Boulevard	Offsite	PHCs, BTEX, PAHs, metals	None	None	No sample locations associated with APEC.
APEC-130	Rail Sidings - According to the 1951 FIPs (Terrapex, 2009) rail sidings were on the central portion of 685 Lake Shore Blvd (1951 FIP; Terrapex, 2009)	46 - Rail Yards, Tracks and Spurs	685 Lake Shore Boulevard	Offsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC.
APEC-131	Former Fuel Oil AST- According to the 1953 FIP (Terrapex, 2009) 225 Commissioners street had one 4,500,000 gal fuel oil tank owned by Fuel Oil Equipment Ltd.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	225 Commisioners Street	Offsite	PHCs, BTEX, PAHs	None	None	No sample locations associated with APEC.
APEC-132	Former ASTs - According to the 1953 and 1973 FIPs (Terrapex, 2009), Sun Oil Co. had 5-6 ASTs (at least 2 appear to be upward of 2,800,000 gal gasoline tanks) on the east portion of 225 Commissioners Street immediately east of the Fuel Oil Equipment AST.	28 - Gasoline and Associated Products Storage in Fixed Tanks	225 Commisioners Street	Offsite	PHCs, BTEX, PAHs, metals (for gasoline tanks)	None	None	No sample locations associated with APEC
APEC-133	Former Coal Storage - According to the 1953 FIP in the Terrapex (2009) report, J. Frank Jones Coal Ltd. stockpiled coal at 15 and 1-17 Basin Street.	NA	15 and 1-17 Basin Street	Offsite	PAHs, metals	None	None	No sample locations associated with APEC.
APEC-134	Soil Material Stockpiles - Based on an aerial Google view of the site at 1-17 Basin Street there appears to be stock piled material along the southern portion of the property.	30 - Importation of Fill Material of Unknown Quality	1-17 Basin Street	Offsite	Metals/inorganics, PAHs, PHCs	None	None	No sample locations associated with APEC.
APEC-135	Former Fuel Oil ASTs - According to the 1953 FIP (Terrapex, 2009), Fuel Oil Equipment Ltd occupied the property at 23 and 23 R Basin Street; 2 fuel oil ASTs were present (8,500,000 gal and 845,000 gal) and an oil and greasing room appear in the 1953 FIP.	58 - Waste Disposal and Waste Management 41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	23/23 R Basin Street	Offsite	PHCs, BTEX, PAHs	None	None	No sample locations associated with APEC.
APEC-136	Soil Material Stockpiles - Based on an aerial Google view it appears that soil material is being stockpiled on the property at 101 Commissioners Street.	30 - Importation of Fill Material of Unknown Quality	101 Commissioners Street	Onsite	Metals/inorganics, PAHs, PHCs	pH, inorganics/ metals, PAHs, PHCs, VOCs	None	Current and/or historical sampling activities have captured the COCs associated with this APEC for soil. No groundwater sampling completed at APEC.
APEC-137	Former Tank Farm - According to 1951 and 1973 FIPs (Terrapex, 2009) Texaco Canada Oil Co. Ltd and McColl Frontenac Oil Co. used the majority of the block of land extending from 21 to 63 Commissioners Street (bound by Cherry Street to the west and the Shipping Channel to the south) as a tank farm. Approximately 34 ASTs were present across the site ranging in size from approximately 1600 barrels (Bbls) to more than 100,000 Bbls. Tanks contents varied across the site and included crude oil, benzol, furnace oil, gasoline, fuel oil and cycle (majority were approx. 80,000 Bbls). 28 smaller ASTs, approximately 1000 Bbls, were present in the northeast portion of the tank farm area and were noted to be blending and grease storage tanks. Texaco Canada occupied the western portion of the tank farm; McColl Frontenac occupied the eastern portion. Based on aerial photos from the Terrapex (2009) report, the tank farm was present on the property from 1947 until 1985; by 1992 many of the tanks had been removed. McColl Frontenac Oil Co. Ltd. – Oil Refinery (1925 to 1949); McColl Frontenac/Texaco – Petroleum Products Terminal, Blending, and Grease Plant (1949 to 1990); Imperial Oil (1990 to 1994). Historical reports indicate spills in the north section. LNAPL recovery program in 1990s. Full scale clean-up estimated to 310,000m^3 soil to 5.0 mbgs and 20,000 m^3 of LNAPL.	28 - Gasoline and Associated Products Storage in Fixed Tanks 41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	21-63 Commissioners Street, 185 Cherry Street	Onsite	PHCs, BTEX, PAHs, metals	pH, metals/ inorganics, PAHs, PHC, VOC	pH, metals/ inorganics, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.

Table 2-2. Areas of Potential Environmental Concern within the Port Lands

Port Lands, Toronto, ON

Areas of Potential Environmental Concern (APEC)		PCA[a]	Location of PCA[b]		COCs (based on AP method groups2,3)	List of Parameter Groups tested (soil)	List of Parameter Groups Tested (GW)	Comments
APEC-138	Former Oil Separator - According to a 1951 FIP (Terrapex, 2009) an oil seperator was present immediately northwest of the tank farm on the former Texaco Canada lands at 21 Commissioners Street. The oil seperator was likely part of Texaco Canada operations to the immediate south.	41 - Petroleum-derived Gas Refining, Manufacturing, Processing and Bulk Storage	21 Commisioners Street	Onsite	PHCs, BTEX, PAHs	None	None	No sample locations associated with APEC.
APEC-139	Former ASTs - According to a 1951 FIP (Terrapex, 2009) seven 500 Bbls marketing tanks were present in the northwest portion of the property at 21 Commissioners Street. Another four smaller ASTs were present immediately west of the marketing tanks, south of the garage. These tanks were likely part of the Texaco Canada operations to the immediate south.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	21 Commisioners Street	Onsite	PHCs, BTEX, PAHs, metals	None	None	No sample locations associated with APEC.
APEC-140	Former Garage - According to a 1951 FIP (Terrapex, 2009) a garage was present at the northwest corner of the property at 21 Commissioners Street.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	21 Commisioners Street	Onsite	PHCs, BTEX, PAHs, metals	None	None	No sample locations associated with APEC.
APEC-141	Cabinet Manufacterer - According to a 1951 FIP (Terrapex, 2009) a building that housed Kent McClain Ltd Cabinet Manufacturing was present in the north portion of 31-39 Commissioners Street. Noted within the building were a glue department, box making, finishing room and a garage immediately west of the main building. A smaller shipping and storge area was present immediately east of the main building.	59 - Wood Treating and Preservative Facility and Bulk Storage of Treated and Preserved Wood Products	31-39 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	pH, metals/ inorganics, PAHs, PHC, VOC	pH, metals/ inorganics, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-142	Blending and Grease Building, Tank House, Drum Reconditioning-shown in the 1951 FIP (Terrapex, 2009) as part of the McColl Fontenac operations at 63 Commissioners Street.	41 - Petroleum - derived Gas Refining, Manufacturing, Processing and Bulk Storage	63 Commissioners Street	Onsite	PHCs, BTEX, PAHs, metals	pH, metals/ inorganics, PAHs, PHC, VOC	pH, metals/ inorganics, PAHs, PHC, VOC	Current and/or historical sampling activities have captured the COCs associated with this APEC for both soil and groundwater.
APEC-143	Polymerization Plant - According to a 1951 FIP (Terrapex, 2009) a polymerization plant was present on the McColl Frontenac portion of the tank farm area (northwest portion) and appeared to be part of the oil processing operations part of the tank farm.	43 - Plastics (including Fibreglass) Manufacturing and Processing	5741 Commissioners Street	Onsite	VOCs, PHCs, metals/inorganics, PAHs	None	None	No sample locations associated with APEC.
APEC-144	Rail Sidings - According to the 1951 and 1973 FIPs (Terrapex, 2009) rail sidings were on the central north and south portion of the site occupied by Texaco Canada and McColl Frontenac.	46 - Rail Yards, Tracks and Spurs	33-63 Commissioners Street	Onsite	VOCs, PAHs, PHCs, metals, OC pesticides, chlorophenols	None	None	No sample locations associated with APEC.

Notes:

CrVI - hexavalent Chromium
Cu - Copper
D(ah)A - Dibenzo(ah)anthracene
EC – Electrical conductivity
F2 - PHCs (C10-C16 Fraction)
F3 - PHCs (C16-C34 Fraction)
F4 - PHCs (>C34 Fraction)
Hg - Mercury
MeCl- - Methylene Chloride
MeHg - Methyl Mercury
Mo - Molybdenum
PAHs – Polycyclic aromatic hydrocarbons
PCA – Potentially contaminating activity
PCE - Tetrachloroethylene
Pb - Lead
PCBs – Polychlorinated biphenyls
PHCs – Petroleum hydrocarbons
Sb - Antimony
Se - Selenium
TCE - Trichloroethylene
UST – Underground Storage Tank
VC - Vinyl Chloride
VOCs – Volatile organic compounds
Zn - Zinc

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Preliminary Environmental Site Assessment, Quebec and Ontario Paper Company, Toronto Recycling Centre, Toronto, Ontario	May 1991	Golder Associates Ltd.	Blake, Cassels & Graydon	Investigation comprised of a site inspection, interview with site operations personnel, MOE file and historical air photo review and an intrusive investigation to determine presence and range of impacted materials across the site. A total of 8 boreholes and 3 monitoring wells were installed. Soil and groundwater samples were collected and submitted for laboratory analysis. The report noted that the most significant environmental concern was related to the gasoline UST which has the potential for onsite and offsite impacts. Other impacts noted include elevated metals (lead and arsenic), oil and grease, TOC, manganese, benzene and phenolics concentrations.
Environmental Investigation for the Toronto Harbour Commissioners, 85 Commissioners Street, Toronto, Ontario	March 27, 1992	Proctor & Redfern Limited	Toronto Harbour Commissioners	Proctor & Redfern Limited were retained by the THC to conduct additional sampling and analysis to more fully document the soil characteristics at 85 Commissioners Street. 28 test pits were excavated, 16 of which were near locations sampled in a previous sampling program and 12 "new" locations to provide adequate site coverage. Samples were taken of the fill material to groundwater depth. Most samples were analyzed for BTEX, samples from the "new" locations were analyzed for oil and grease and the selected heavy metals consisting of copper, chromium, cadmium and lead; six samples were analyzed for PAH as a result of field observations. Based on the investigation results Proctor and Redfern developed a variety of scenarios for redevelopment of the proposed Harkow site with a total cost of $870,000 with the most significant cost, being that of engineered fill, is based on obtaining fill material from commercial sources.
Phase II Environmental Assessment- 105-165 Villiers Street and 150 Commissioners Street, Toronto, Ontario	July 1992	Golder Associates Ltd.	CP Express and Transport	Phase II ESA comprised of the following investigative techniques: (i) ground surface electromagnetic geophysics; (ii) soil vapour survey and (iii) additional monitoring wells for further characterization of soil and groundwater. The geophysics survey identified a number of buried objects such as fuel tanks/drums, utility lines and old foundations. The shallow soil vapour survey was used to delineate areas of gross petroleum/solvent impacts and locate addition boreholes. Data collected suggests site has been moderately impacted by organic compounds. Floating product was measured in one monitoring well.
Phase I Environmental Assessment- 105-165 Villiers Street and 150 Commissioners Street, Toronto, Ontario	July 1992	Golder Associates Ltd.	CP Express and Transport	Phase I ESA comprised a site history review and borehole drilling program. Thirteen (13) boreholes were drilled and sampled across the site. Monitoring wells were installed in each borehole; one deep monitoring well was installed, no groundwater samples were collected as part of the investigation. Hydrocarbon and chemical/solvent odours and impacts were noted at various locations across the site.
Draft-Environmental Site Preparation, Proposed Harkow Facility, 85 Commissioners Street	March 1993	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	Outlines the remedial program developed on the basis of findings and recommendations in the DSC Decommissioning Plan report dated December 4, 1992. The report proposed to proceed with a remedial option involving the selective removal of contaminated soil and/or treatment to reduce the concentration of inorganic and organic parameters in the soil to a level meeting the requirements of the Harkow Certificate of Approval for a waste management site. It was also proposed that NAPLs be removed from the groundwater surface as part of the site remediation program.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Baseline Environmental Assessment, 97 Commissioners Street, Toronto, Ontario	August 5, 1994	Dames and Moore, Canada	Harbour Remediation and Transfer Inc.	A baseline environmental assessment was conducted by Dames and Moore to assess current conditions on-site prior the treatment of contaminated soils by Harbour Remediation and Transfer Inc. Three boreholes (BH1-BH3) were drilled on April 15, 1994 and all were installed as monitoring wells. Two existing monitoring wells were also present onsite (BH4 and BH5) during the investigation. Groundwater removed from BH5 had a black oily sheen and strong hydrocarbon odour. Soil and groundwater samples were submitted for laboratory analysis; soil results were compared to the CCME Remediation Criteria for Soils (1991) and the MOEE Guidelines for Decommissioning and Clean-up of Sites in Ontario (1989); groundwater results were compared to the CCME Interim Remediation Criteria for Water (1991) and the MOEE Ontario Drinking Water Objectives (1992). The following conclusions were reached during the assessment: • Diesel UST which was removed contributed to onsite contamination; a two stage oil separator may also have impacted the site. • Elevated metals and inorganic concentrations were found across the site in both soil and groundwater. Regular sampling of existing monitoring wells across the site was recommended.
Risk Assessment for the Proposed Redevelped Form of the Harkow Recycling Facility, 85 Commissioners Street, Toronto, Ontario	March 1995	Angus Environmental Limited	City of Toronto Economic Development Corporation	Risk Assessment undertaken to estimate the potential health effects that future tenants of users of the site might realize after remediation and redevelopment. Generally it was found that the proposed redevelopment will not result in unacceptable exposures and as a result human health concerns should not be a cause for altering the proposed design of the facility.
Supplementary Phase III Work at 105-165 Villiers Street and 150 Commissioner's Street , Toronto, Ontario	August 14, 1995	ADAMAS Environmental Inc.	CP Rail System	Supplementary Phase III included excavation of thirty-two (32) test pits, drilling of five boreholes, and laboratory analysis of soil and groundwater samples. Seventeen (17) petroleum storage tanks found to be present and require removal. Approximately 39,150 m^3 soil were identified for remediation or removal from the soil so that remaining soil meets relevant criteria. Groundwater concentrations of pyrene found to exceed relevant criteria. VOC contamination measured in wells on and surrounding 165 Villiers Street. LNAPL and DNAPL contamination identified. Offsite migration of contaminants northward and southward was observed. Possible soil and groundwater remedial measures identified.
Underground Storage Tank Removals – 105-165 Villiers/ 150 Commissioners, Toronto, Ontario	March 1998	Decommissioning Consulting Services Limited	Canadian Pacific Limited	Eight USTs and one oil/water interceptor were removed from the 105-165 Villiers/150 Commissioners site. Remediation criteria was to remove any grossly contaminated soil in the excavation. One excavation location has total xylene concentrations in excess of the MOE Table B criteria.
Pre-lease Commencement Audit, 75 Commissioners Street, Toronto, Ontario	December 2000	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	The facility inspection and site investigation work that that was completed as part of the audit, was carried out to identify the presence of waste or other concerns within the portion of the building to be leased by United Rentals, as well as establish baseline subsurface conditions for future comparison with the findings of a termination audit at the end of the lease to permit a determination to be made of the

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				contribution to overall environmental liabilities at the site, if any, caused during the new tenant's occupancy. The subsurface investigation was comprised of the advancement of five boreholes (BH1 –BH5), two of which were installed as monitoring wells. Soil samples were collected and analyzed for metals, anions, TPH, VOCs, PAH and PCBs. Groundwater samples were analyzed for metals, anions, pH, VOCs and TPH. The investigation was carried out to confirm the presence of historical petroleum hydrocarbon contamination in soil at levels exceeding the MOE Table B industrial/commercial criteria across of the site. Inorganic impacts consisting of arsenic, cadmium and boron were also found at shallower depths in localized areas in the northeastern portion of the site at levels marginally above their respective guidelines. The presence of asphalt pavement over the affected areas provides all necessary exposure protection in this regard. No groundwater impacts were identified during the course of the investigation that exceeded the MOE Table B Standards.
Commencement Audit, 80 Commissioners Street, Toronto, Ontario	November 2002	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	A site inspection and facility evaluation that consisted of an audit was carried out to identify the presence of waste or other concerns on the subject property, which was to be leased by PS Production Services Ltd. (subtenant and occupant of the site), as well as establish baseline conditions for future comparison with the findings of a termination audit at the end of the lease to permit a determination to be made with respect to the contribution to overall environmental liabilities at the site, if any, caused during PS Production's occupancy of the site as the primary tenant. The assessment of facility conditions identified a number of issues which have either had a direct impact on the site or pose potential regulatory compliance issues with respect to handling and disposal including designated substances, PCBs, CFCs and asbestos. ASTs and USTs were also identified onsite. Based upon the subsurface contaminants confirmed to exist on the site (inorganics, PAHs, heavy oil), it was not considered that any requirement exists to proceed with any form of soil cleanup from a human health and safety or ecological perspective. It was recommended that removal and disposal of contaminated soil be considered if building or infrastructure expansion plans were to be implemented in the future to manage soil that is excavated from affected areas.
Phase I Environmental Site Assessment- Knob Hill Farms Lease 222 Cherry Street, Toronto, Ontario	October 31, 2002	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	Phase I ESA investigating the condition of the property and potential for the presence of environmental liabilities that may be attributable to actual use of the tenants, Knob Hill Farms. Potential environmental issues associated with the past use on and adjacent to the noted property include: • metals and PAH from historic coal storage; • PCB contamination from a row of transformers; • PHC from fuel oil leak from a UST on the adjacent Canada Cement property; and, It is considered likely that some subsurface environmental liability issues may have accrued during the term of Sevendon/ Knob Hill lease including inorganic contaminants in near-surface soil and PHC contamination in near-surface soil. It is suspected that fluorescent ballast present within the building may contain PCBs, based on the building construction date.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Phase II Environmental Site Assessment- 222 Cherry Street	February 2003	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	Phase II ESA completed at 222 Cherry Street consisted of completion of five (5) boreholes to assess subsurface soil conditions, including completion of one (1) borehole as a monitoring well to assess Phase I findings with included coal fuel stockpiles and storage, a former transformer location, USTs and stained areas. Soil samples were submitted for laboratory analysis for metals, light fuels, heavy oil total petroleum hydrocarbons, PCBs, PAHs and BTEX. Groundwater samples were submitted for laboratory analysis of metals, PAHs, TPH and BTEX. Samples were compared against the applicable MOE Table B Soil and Groundwater Standards. Elevated electrical conductivity was observed in shallow fill soils at three locations. Elevated arsenic concentrations were found in soil at one location. No groundwater exceedances were reported.
Site Characterization Update-Former CP Express Transport Site	November 2006	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	Undertaken in support of the Purchase and Sale agreement between TEDCO and Canadian Pacific Express and Transport (CPET) for 150 Commissioners Street and 155 Villiers Street and related to the Lease Termination for 105 and 165 Villiers. No major environmental issues were identified that would add significantly to the soil and groundwater previously identified on the CPET site and would not materially affect the cost of redevelopment of the site.
Supplementary ESA- CPET Lands Purchase & Lease Termination, 150 Commissioners Street and 105 to 165 Villiers Street, Toronto, Ontario	October 5, 2006	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	Agreement made by Fairmont for TEDCO to acquire the former CPET lands at 150 Commissioners Street and 155 Villiers Street in the Toronto Port Lands. Review of information confirms no significant issues over and above those that had already been identified. Proposal to conduct a supplementary investigation was included which was comprised of drilling six boreholes, installation of 3 monitoring wells. Information will be used to address the presence of previously unidentified environmental liabilities that would changes the transaction to TEDCO.
Draft Termination Audit, 99 Commissioners Street, Toronto, Ontario	February 2007	Decommissioning Consulting Services Limited	The City of Toronto Economic Development Corporation	Investigation completed as part of the Termination Audit for the property at 99 Commissioners Street to inspect and evaluate existing site conditions for the purpose of assessing the impact of the current tenant activities on the quality and condition of the existing facilities, as well as on soil and groundwater quality. The data review identified evidence of mainly VOC and hydrocarbon contamination on site likely associated with the former presence of the British Forging and operation and adjacent former fuel storage facilities. No significant issues were identified in association with the use of the property by National Rubber Inc. since 1993. Information regarding a diesel spill and staining concerns were noted; DCS recommended a limited Phase II investigation be undertaken.
Supplementary Soil Investigation, 99 Commissioners Street, Toronto, Ontario	May 2007	Decommissioning Consulting Services Limited	The City of Toronto Economic Development Corporation	DCS installed two boreholes (BH-1 and, BH-2) to investigate the presence and significance of petroleum hydrocarbon contamination in soil underlying a stained concrete vehicle refueling pad. The laboratory analysis reported no detectable concentrations of PHCs.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Factual Report-Supplemental Phase II Environmental Site Assessment-105 Villiers Street	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	Supplemental Phase II ESA completed for 105 Villiers Street. The environmental soil quality information was summarized as follows: • Fill quality information collected historically by others has noted concentrations of volatile organic compound (VOC) including chlorinated hydrocarbon, PAH and PHC parameters that were greater than historical MOE commercial/industrial and residential/parkland guidelines. • Fill quality information collected by CH2M during the 2005 investigation has identified heavy metal, volatile organic compound (xylenes), PAH and CCME PHC Fractions parameter concentrations above MOE Table 3 residential/parkland standards. The environmental groundwater quality information was summarized as follows: • Groundwater quality information collected by others during previous site work notes concentrations of volatile organic compound (benzene) and PAH parameters which are greater than historical MOE non-potable water guidelines. • Groundwater quality information collected by CH2M during the 2005 investigation has identified heavy metal (mercury) and PAH parameter concentrations greater than current MOE generic non-potable groundwater quality standards. In addition, elevated CCME PHC fractions concentrations were reported although at the time of the investigation there were no CCME PHC MOE Table 3 standards for these fractions for a non-potable water condition.
Factual Report-Supplemental Phase II Environmental Site Assessment-165 Villiers Street, Toronto, Ontario	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	The supplemental Phase II ESA environmental soil quality information for 165 Villiers Street can be summarized as follows: • Fill quality information collected historically by others has noted concentrations of VOC, BTEX and chlorinated hydrocarbon parameters, and PHC parameters that were greater than historical, applicable MOE commercial/ industrial and residential/parkland guidelines. • Fill quality information collected by CH2M during the 2005 investigation has identified heavy metal (boron), volatile organic compound (toluene and total xylenes), and CCME PHC Fractions parameter concentrations above MOE Table 3 residential/parkland standards. The supplemental Phase II ESA environmental groundwater quality information for 165 Villiers Street can be summarized as follows: • Groundwater quality information collected by others during previous site work notes concentrations of VOC parameters, BTEX and chlorinated hydrocarbons, which are greater than historical MOE non-potable water guidelines. • Groundwater quality information collected by CH2M during the 2005 investigation has identified heavy metal (mercury), VOC (cis-1,2 Dichloroethylene, Toluene, Xylene and Vinyl Chloride), and PAH parameter concentrations greater than current MOE generic non-potable groundwater quality standards. • The 2005 investigation confirmed the presence of a 5-mm thick petroleum-like product layer on the groundwater surface at the monitoring well BH-167 location.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Factual Report-Supplemental Phase II Environmental Site Assessment-155 Villiers Street	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	The supplemental Phase II ESA environmental soil quality information for 155 Villiers Street can be summarized as follows: • Fill quality information collected historically by others has noted concentrations of VOC, and PHC parameters that were greater than historical, applicable MOE residential/parkland guidelines. • Fill quality information collected by CH2M during the 2005 investigation has identified heavy metal, VOCs, and PHC parameter concentrations above MOE Table 3 residential/parkland standards. The supplemental Phase II ESA environmental groundwater quality information for 155 Villiers Street can be summarized as follows: • Groundwater quality information collected by others during previous site work notes concentrations of volatile organic compound (toluene and xylenes) parameters that are greater than historical MOE non-potable water guidelines. • Groundwater quality information collected by CH2M during the 2005 investigation has identified heavy metal (mercury) and VOC (xylene) parameter concentrations greater than current MOE generic non-potable groundwater quality standards. Elevated CCME PHC fraction concentrations were also encountered; however, there are currently no non-potable groundwater standards for these fractions. The 2005 investigation also confirmed the presence of a 193-mm thick petroleum-like product layer on the groundwater surface approximately 15 metres north of historical test pit TP18 at the BH/MW 159 location. A 50 mm thick petroleum-like product layer on the groundwater surface was also encountered at the BH/MW 163 location along the east property boundary.
Factual Report-Supplemental Phase II Environmental Site Assessment-150 Commissioners Street	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	For this investigation CH2M supervised the installation of six (6) boreholes and four (4) borehole/groundwater monitoring wells at the site. A total of thirty-three (33) soil samples from nine (9) boreholes/monitoring well locations were submitted for laboratory analysis from various depths collected at the Site. In general, soil samples were submitted to analyze for the following chemical parameters: Volatile Organic Compounds (VOCs), Canadian Council of Ministers of the Environment Petroleum Hydrocarbon Fractions (CCME PHC Fractions), Polycyclic Aromatic Hydrocarbons (PAHs) and Heavy Metals (metals, including Arsenic (As), Zinc (Zn) and Mercury (Hg)). A total of three (3) groundwater monitoring wells were sampled. Groundwater samples were submitted for laboratory analysis of VOCs, CCME PHC Fractions, PAHs and metals. MOE Table 3 parkland/residential/institutional property use standards for a coarse grain - textured soil (where specified) in a non-potable groundwater condition were used for comparison with the results of chemical analysis on selected soil and groundwater samples. The supplemental Phase II ESA environmental soil quality information for 150 Commissioners Street summarized as follows: • Fill quality information collected historically by others has noted concentrations of heavy metal, volatile organic compound

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				(VOC), polycyclic aromatic hydrocarbon (PAH) and petroleum hydrocarbon (PHC) parameters that are greater than current provincial generic commercial/industrial land use standards. • Fill quality information collected by CH2M during the 2005 supplemental Phase II investigation has identified heavy metal and PHC parameter concentrations that are greater than current provincial generic residential/parkland land use standards. At depths greater than 0.6 mbgs, black staining and hydrocarbon-like odours were noted in the soil samples collected from BH-173, BH-169, and BH-170 location. The supplemental Phase II ESA environmental groundwater quality information for 150 Commissioners Street summarized as follows: • Groundwater quality information collected by others during previous site work notes concentrations of VOCs and PAH parameters that are greater than current provincial generic non-potable groundwater standards. • Groundwater quality information collected by CH2M during the 2005 investigation identified only one heavy metal (mercury) parameter concentration at one groundwater sample location greater than current MOE generic non-potable groundwater quality standards. Elevated CCME PHC F2 and F3 fraction concentrations were also found at this same well location. No phase-separated hydrocarbons were detected in the four monitoring wells installed by CH2M HILL.
Final Factual Report-Soil and Groundwater Investigation-10 Munition Street	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	Investigation comprised the completion of one (1) monitoring well installed at 10 Munition Street near 309 Cherry Street. In general, soil and groundwater samples were collected for PHC, VOC, PAH, and metals analysis. PHC F1 concentrations in soil exceeded the MOE Table 3 standard. The PHC F2, F3 and F4 concentrations met the standard. No VOC or PAH parameters were reported to be present in soil at concentrations exceeding the MOE Table 3 standards. All PHC fractions (F1-F4) were detected in the sample taken from the well, with the highest concentration detected (38, 000 µg/L) present in the F2 range. PAH, VOCs and metals concentrations did not exceed the MOE Table 3 Standards.
Final Factual Report-Phase II Environmental Site Assessment-309 Cherry Street ROWs, 54 Commissioners Street	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	Phase II ESA completed for the roadways (rights-of-way) surrounding 309 Cherry Street and at 54 Commissioners Street. Sewer sampling and inspections were completed. The property of interest was 309 Cherry Street; however, access to the site was not obtained at the time of this ESA. Drilling locations were established in the roadways of Cherry, Commissioners Villiers and Munition Streets, and at the adjacent property at 54 Commissioners Street. Several large waste oil storage tanks of unknown age and condition were present at 309 Cherry Street. The report indicates that improper waste disposal practices have been documented in the past at the site, including disposal of wastes into sewers. Twelve monitoring wells were installed, including three at 54 Commissioners Street. Soil and groundwater samples were collected for PHC, PCB and PAH analysis. At 54 Commissioners Street soil were reported to be impacted by PHC F1 and F2, BTEX and PAH. At 309 Cherry Street ROW soil was reported to be impacted by PHC F1, F2 and/or F3. Sheen was observed on well purge water at a number of monitoring wells which as per the requirements of the

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				O. Reg. 153/04 Standards would not meet the applicable site condition standard in relation to a petroleum hydrocarbon given the presence of visible petroleum hydrocarbon film or sheen in the ground water at the selected wells.
Final Factual Report, Soil and Groundwater Investigation- 281 Cherry Street, Toronto, Ontario	April 2008	CH2M HILL Canada Limited	Toronto Waterfront Revitalization Corporation	This factual report presents subsurface information gained as a result of an earlier investigation carried out for TWRC by Toronto Waterfront Joint Venture. One monitoring well was installed at the 281 Cherry Street site, southeast of a former transformer sub-station. Soil and groundwater samples were collected for PHC, VOC, PCBs, and PAH analysis. The laboratory analytical results for soil indicated that the PHC, VOC, and PAH concentrations met the MOE Table 3 standards at MW 13. PCBs were not detected in soil. The laboratory did not detect any PHC (F1- F4) parameters in the groundwater sample. The laboratory analytical results indicated that the groundwater VOC and PAH concentrations met the MOE Table 3 Standards.
Subsurface Investigation in Support of the Environmental Assessment for the Don Mouth Naturalization and Port Lands Flood Protection Project	October 5, 2009	SLR Consulting (Canada) Ltd.	Toronto and Region Conservation Authority	The SLR investigation consisted of a utility location survey, the drilling of sixty-eight (68) boreholes with forty-six (46) completed as monitoring wells, the collection of soil and groundwater samples for environmental laboratory analysis, and the collection of geotechnical data. Metals and inorganics impacts in soil and/or groundwater above the MOE Table 1 or 3 Standards determined to be applicable across the site. Polycyclic Aromatic Hydrocarbon (PAH) soil and/or groundwater impacts above the MOE Table 1 or 3 MOE Standards determined to be applicable were identified across the site. PHC soil impacts above the MOE Table 3 Standards determined to be applicable were identified across the site. Volatile Organic Compound (VOC) soil and/or groundwater impacts above the MOE Table 1 or 3 Standards determined to be applicable were identified across the site. Soil and groundwater impacts were identified across the Site possibly as a result of impacted fill being placed at the Site or from the various historical industrial uses of the Site. The most significant impacts were identified at and down gradient of the portion of land that includes 21-63 Commissioners Street and 186 Cherry Street. SLR identified LNAPL in monitoring wells BH144, BH147, BH148 and BH150 ranging from 0.01 to 0.30 metres in thickness. These impacts were likely the result of the historical use of this Site for petroleum refining, storage and distribution.
Environmental Subsurface Characterization, PortLands Sports Complex, 85, 95, 99, 99A Commissioners Street, Toronto, Ontario	November 9, 2009	Decommissioning Consulting Services Limited	City of Toronto Economic Development Corporation	DCS completed a joint geotechnical/environmental subsurface investigation of TEDCO-owned land comprising four properties located at 85, 95, 99 and 99A Commissioners Street in the Port Lands Industrial District (PIA) of the City of Toronto. Consideration was being given to the use of the properties for the construction of a sports complex. Nine boreholes (DCS BH09-1 to 9) were installed to investigate the subsurface conditions with two being completed as monitoring wells (BH09-1 and 2). Soil concentrations at 85 and 95 Commissioners exceeded the Table 3 ICC Standards for boron, PAHs, and PHC F2-F4, At 99/99A Commissioners metals, EC, SAR, PAHs and PHCs exceeded the Table 3 RPI Standards. Marginal exceedances for PAHs were found in groundwater.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Draft Phase I Environmental Site Assessment, 85-95 Commissioners Street, Toronto, Ontario	December 22, 2009	Terrapex Environmental Ltd.	Toronto Port Lands Company	A Phase I ESA was completed which identified actual and potential sources of contamination on the properties associated with 85-95 Commissioners Street. Several areas of potential and actual contamination were noted as follows: • Presence of various industrial facilities across the site including Supertest Petroleum, artillery shell manufactures, steel companies, and recycling facilities • Waste generators for a variety of wastes including waste oils, lubricants, paint, pigment, etc. were registered at the site and adjacent sites. • Private fuel outlet and the presence of USTs • Potential free phase observed in a manhole. • Potentially contaminating activities taking place at neighboring properties that could impact the site. Further sampling was recommended to determine presence of actual environmental concerns at the site.
Phase II Environmental Site Assessment- 281 Cherry Street, Toronto, Ontario	April 2011	Occupational Hygiene and Environment	Toronto Hydro-Electric System Limited	Phase II ESA characterizing subsurface environmental conditions and the collection and submission of soil and ground water samples for laboratory analysis, for the former electrical transformer station located at 281 Cherry Street in Toronto, Ontario. A total of ten (10) boreholes were advanced to depths ranging from approximately 1.2 m (BH8) to 4.9 m below grade. Four (4) of the boreholes were completed as ground water monitoring wells. Eleven (11) soil samples and four (4) ground water samples were collected from the site and submitted for laboratory analysis of benzene, toluene, ethyl benzene and xylenes (BTEX), volatile organic compounds (VOCs), petroleum hydrocarbons (PHC, F1 to F4 fractions), polychlorinated biphenyls (PCBs) and/or selected metals. PHC (F2) concentrations in soil exceeding the applicable MOE Table 3 Standards were observed at borehole location BH7 in the north eastern portion of the Property inside the building. Elevated PHC concentrations in the F1-F3 range were detected in ground water sampled from MW4. However, no derived values existed at the time the report was written for comparative purposes against the applicable table Standards. Review of the analytical results for this ground water sample indicated that concentrations of VOCs, PHCs (F1-F4), PCBs and/or selected metals were below the applicable Table 3 Standards. Based on the calculated ground water direction of flow, from North to South, OHE noted that there was potential for off-site impacts from the neighbouring properties. OHE recommended the development of a remedial plan with additional delineation of the identified soil exceedances and additional investigation into potential soil and groundwater impacts to and/or from offsite properties based on their findings.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Groundwater Monitoring Event - Spring 2011, 75 Commissioners Street, Toronto, Ontario	July 6, 2011	Conestoga-Rovers & Associates	Toronto Port Lands Company	A previous monitoring well (BH-1) installed by DCS in 2000 was sampled as part of this investigation. All analyzed parameters were detected in the groundwater at concentrations below the applicable MOE Table 3 (non-potable) standards and no evidence of LNAPL or DNAPL was found. No evidence of free phase product was encountered during the well development and sampling activities.
Draft- Limited Environmental Testing and Hazardous Materials Survey-281 Cherry Street	August 31, 2012	Golder Associates Ltd.	Toronto Port Lands Company	Evaluated groundwater conditions at 281 Cherry Street, and included collection of an indoor ambient-air sample from the Site building and included completion of a limited, non-intrusive survey of the Site for hazardous material/designated substances prior to the execution of a Purchase and Sale agreement. Four (4) existing onsite MWs were resampled, a 24-hour indoor air sample was collected and a hazardous materials survey was completed. Exceedances of the MOE Table 3 Standards were observed at one monitoring well location for PHC F2 and F3. Air monitoring results found that no concentrations in excess of the provided criteria were present.
2013 Soil Biopile Sampling Summary Report-Villiers Street Biopile Area	July 5, 2013	Stantec Consulting Ltd.	Toronto Port Lands Company	Stantec Consulting Ltd. (Stantec) prepared this report for the Toronto Port Lands Company to document the soil sampling activities at 150 Commissioners Street in Toronto, Ontario. The site, located at the southeast corner of Villiers Street and the Don Roadway contained approximately 31,750 cubic metres (63,500 tonnes) of petroleum-impacted soil undergoing bioremediation in a series of windrow stockpiles. Sampling was restricted to the north portion of the site, where approximately 11,000 cubic metres of soil cover approximately 50% of the site area. Soils at the site were primarily impacted by petroleum hydrocarbon (PHC) fractions 2 and 3 (F2 and F3) exceeding the Ontario Table 3 Site Condition Standard for an industrial/commercial/community property use. The 40% remainder of soil stockpiles required additional time for bioremediation to occur. The following summarizes the methodology of the soil sampling program: • Based on an approximate volume of 11,000 cubic metres, the soil piles were divided into 160-cubic-metre sections and a discrete soil sample was collected by hand augering and/or digging to a depth of approximately 0.3 m below the biopile surface. • A discrete soil sample recovered from each 160-cubic-metre section was submitted to Maxxam Analytics Inc. (Maxxam) for analysis of one or more of the following chemical parameters: PHC F1 to F4, BTEX, VOCs, selected metals and inorganics, and/or PCBs. Soil quality of the 11,000 cubic metres of biopile windrows included: • Approximately 8,000 cubic metres of soil met the Ontario Table 3 SCS for ICC land uses for the parameters tested. • Approximately 5,600 cubic metres of soil met the Ontario Table 3 SCS for RPI land use for the parameters. • Approximately 8,000 cubic metres of soil met the Ontario Table 2 SCS for an ICC land uses for the parameters tested. • Approximately 5,440 cubic metres of soil met the Ontario Table 2 SCS for RPI land uses for the parameters tested. • None of the soil met the Ontario Table 1 SCS.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Quality Control of Quality Assurance Report - imported Shale: 101 Commissioners Street and 1 & 17 Basin Street. Toronto, Ontario	September 9, 2013	SPL Consultants Limited	Toronto Waterfront Studios Development Inc.	SPL was retained by TWSD to evaluate the requirements under O.Reg. 153/04 as amended, for shale importation to a Record of Site Condition property in accordance with the CPU attached to the receiving property. The receiving property (herein referred to as the "receiving site") is 101 Commissioners Street, and 1 & 17 Basin Street in the City of Toronto. SPL's scope of work for this project included the following: 1. Development of a Soil Management Plan (SMP); 2. Monitoring of Receiving Site in accordance with the CPU and SMP; 3. Review of Contractor's importation documentation; 4. Collection and submission of shale samples for analysis to determine importation suitability; and 5. Generation of a confirmation and verification report. SPL concluded the following: 1. One hundred and forty one (141) samples were submitted for analysis and met the Table 1 Standards which supports the importation of 38,000 m^3 of shale to the receiving site. GFL records indicate that a total of 37,260 m3 of shale was imported from the source site to the receiving site. 2. Placement of a minimum of 0.15 m of crushed concrete was completed (per the SMP and CPU). As crushed concrete is a non-soil treatment, analysis of this material was not conducted. Crushed concrete was imported on July 5, 8, 10, Lt and 12, 2013. A total of 292 loads of crushed concrete were imported to the receiving site. 3. Following placement of the crushed concrete a topographic survey was completed to allow an accurate cross section of the cap thicknesses to meet the requirements of the CPU.
Phase One Environmental Site Assessment, 312 Cherry Street, Toronto, Ontario	November 2013	Golder Associates Ltd.	Essroc Italcementi Group	Phase One ESA completed in accordance with O.Reg. 153/04 conducted as part of the extended lease agreement for the Phase One Property at 312 Cherry Street. The following APECs were identified: APEC 1: The historic and/or current presence of fill material on Site. APEC 2: The western portion of the Site was used historically for the storage of cement tankers. Trimac reportedly had an AST at the Site that was used for refuelling, but no AST was present at the time of the Site visit. APEC 3: Evidence of historic rail spurs that traversed the Site from east to west across the central portion of the Site and along the northern and southern property boundaries were observed. APEC 4: A pad-mounted transformer, constructed in 1957, was observed on Site. APEC 5: Ship docking areas may have been used historically by Century Coal between the 1930s to 1950s. APEC 6: An off-Site waste disposal facility approximately 20 m east of the Site (309 Cherry Street) was used historically as a gasoline service station and petroleum bulk storage site.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Final- Phase II Environmental Site Assessment, 312 Cherry Street, Toronto, Ontario	April 2014	Conestoga-Rovers and Associates	Toronto Port Lands Company	Phase II Environmental Site Assessment of the property located at 312 Cherry Street, Toronto, Ontario conducted between January 31 and February 12, 2014 in general accordance with the document entitled, "CSA Standard Z769-00, Phase II Environmental Site Assessment" for conducting environmental site assessments. The objective was to investigate the general soil and groundwater quality at the Site to document environmental conditions at the time of the termination of the lease. The work is being done as part of an environmental exit audit prior to Essroc ltalcementi Group leaving the site. Three monitoring wells and 2 boreholes were advanced (MW1-14, MW5-14 MW6-14, BH2-13, and BH3-14) during the investigation. The fill was comprised of various amounts of rock fragments, gravel, sand, clay, and silt, some of which had wood debris, PHC-like staining, or orange staining. All soil samples had either PHC F1 to F4, PAHs, metals and/or VOCs concentrations that were above the MOE Table 9 Standard. The soil exceedances were associated with the fill material at the Site and are sporadic in nature. All parameters sampled in groundwater, where detected, were less than the MOE Table 9 Standards with exception of anthracene at MW1-14.
Annual Report- Area-Wide Initiative Groundwater Monitoring And Sampling Results - 2013	June 2014	Decommissioning Consulting Services Limited	Toronto Port Lands Company	DSC carried out environmental groundwater monitoring activities in the Port Lands as part of an ongoing Area-Wide Initiative (AWI) which comprised groundwater level monitoring, free product survey and groundwater sampling. Information was collected from 38 monitoring wells in July 2013 and 20 monitoring wells in October 2013. The groundwater samples were analyzed for general chemistry and inorganic parameters including metals, volatile organic compounds (VOCs), petroleum hydrocarbons (PHCs) and polycyclic aromatic hydrocarbons (PAHs). Investigation data were compared against the AWI trigger values and the MOE Table 3 and Table 9 SCS as applicable. Free product (NAPL) was observed in MW-4B in July 2013 sampling event in a thickness of less than 2 mm. No evidence of free product (NAPL) was observed in any of the monitoring wells in October 2013 sampling event. Sheen was observed in purged water recovered from MW11-6 and MW-100B during the July 2013 sampling event and from MW11-6 during the October 2013 sampling event. Concentrations of inorganic parameters in groundwater samples collected in the July 2013 and October 2013 sampling events exceeded the MOE Table 3 or Table 9 Standards for sodium at MW-24A and MW-24B, chloride at MW-24A and MW-24B and zinc at MW11-1. Concentrations of PHCs in groundwater samples collected in the July 2013 and October 2013 sampling events exceeded the MOE Table 3 or Table 9 Standards for predominantly F1 and F2 fraction PHCs at monitoring wells MW-14, MW11-6, MW11-7, MW-4A, MW-4B, MW-100A, MW-100B, MW-0707, MW-12A, MW-12B, MW-13A and MW-13B. Concentrations of VOCs in groundwater samples collected in the July 2013 and October 2013 sampling events exceeded the MOE Table 3 or Table 9 Standards for benzene at

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				monitoring wells at MW-4A, MW11-6 and MW11-7 and vinyl chloride and trans-1,2-dichloroethene at MW11-5. Concentrations of PAHs in groundwater samples collected in the July 2013 and October 2013 sampling events all met the MOE Table 3 or Table 9 Site SCS at all groundwater monitoring wells with exception of anthracene at MW-100A, MW11-6 and MW11-7, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene at MW11-6 and MW-101B and benzo(a)pyrene and chrysene at MW11-6.
Final-Phase I Environmental Site Assessment, 54 Commissioners Street, Toronto, Ontario	November 6, 2014	Golder Associates Ltd.	Waterfront Toronto	Phase I ESA completed for the property located at 54 Commissioners Street. Based on information obtained and reviewed as part of this report the following APECs were identified to be associated with the subject property: • APEC 1-The historic and/or current presence of fill material onsite. • APEC 2-One empty AST present at the site formerly used for fuel storage. • APEC 3-Areas of the site used for personal vehicle maintenance and vehicle storage • APEC 4-An off-site waste disposal facility adjacent to the site was historically used as a gasoline service station and petroleum bulk storage site. Waste disposal facility also present here, listed as a waste generator. • APEC 5-Evidence of historic rail spurs and rail line activities • APEC 6-An off-site large scale petroleum refinery approximately 50 m south of the site.
Final Report-Phase I Environmental Site Assessment-130 Commissioners Street, Toronto, Ontario	November 18, 2014	Golder Associates Ltd.	Waterfront Toronto	Phase I ESA completed in accordance with O. Reg. 153/04 identified the following six (6) APECs in association with 130 Commissioners Street: APEC 1-Historical and/or current presence of fill material onsite. APEC 2-The presence of four (4) ASTs and one (1) UST at various locations across the site. APEC 3-Use of the site as a scrap metal recycling/processing facility. APEC 4-Adjacent properties 105 and 155 were formerly used for vehicle repair, storage and refueling. 105 Villiers was used for stone blocks and vehicles. APEC 5-The presence of former rail spurs onsite. APEC 6-Adjacent property, 150 Commissioners Street, was formerly used as a petroleum bulk storage site by Imperial Oil and was also a registered generator of solvent wastes and had three registered spills. PCB impacts were also noted on 150 Commissioners Street.
Final Report-Phase II Environmental Site Assessment-130 Commissioners Street, Toronto, Ontario	November 20, 2014	Golder Associates Ltd.	Waterfront Toronto	Phase II ESA identified impacts to soil and groundwater for PHCs, VOCs, PAHs, metals/inorganics. The impacts were observed in various areas around the Site and were not limited to one location. Concentrations of inorganic parameters in groundwater samples collected in the July 2013 and October 2013 sampling events exceeded the MOE Table 3 or Table 9 Site Condition Standards (SCS) for sodium at MW-24A and MW-24B, chloride at MW-24A and MW-24B and zinc at MW11-1. Concentrations of PHCs in groundwater samples collected in the July 2013 and October 2013 sampling events exceeded the MOE Table 3 or Table 9 SCS for predominantly F1 and F2

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				fraction PHCs at monitoring wells MW-14, MW11-6, MW11-7, MW-4A, MW-4B, MW-100A, MW-100B, MW-0707, MW-12A, MW-12B, MW-13A and MW-13B. There are no UCLs specific to PHCs. Concentrations of VOCs in groundwater samples collected in the July 2013 and October 2013 sampling events exceeded the MOE Table 3 or Table 9 SCS for benzene at monitoring wells at MW-4A, MW11-6 and MW11-7 and vinyl chloride and trans-1,2-dichloroethene at MW11-5. Concentrations of PAHs in groundwater samples collected in the July 2013 and October 2013 sampling events all met the MOE Table 3 or Table 9 Site SCS at all groundwater monitoring wells with exception of anthracene at MW-100A, MW11-6 and MW11-7, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene at MW11-6 and MW-101B and benzo(a)pyrene and chrysene at MW11-6. Groundwater impacts at the Site are related to PHC F1, F2 and benzene. Free phase NAPL was identified at one location.
Final-Phase II Environmental Site Assessment, 54 Commissioners Street, Toronto, Ontario	November 6, 2014	Golder Associates Ltd.	Waterfront Toronto	Phase II ESA was comprised of drilling four (4) boreholes which were all completed as monitoring wells. Soil sampling was completed at all locations, two additional existing monitoring wells were monitored. Groundwater samples could not be collected at the site due to the presence of free-phase product being detected at all borehole locations. The thickness of the free-phase product ranged between 0.002 and 0.003 m in the monitoring wells. Soil at the site was reported to be impacted with VOCs, PAHs, PHCs, PCBs, metals/organics all of which exceeded the MOECC Table 3 Standards at all locations.
Limited Environmental Investigation, 20 Polson Street, Toronto, Ontario	September 8, 1997	Shaheen & Peaker Limited	United Castan Corporation	The fieldwork carried out by S&P consisted of drilling a total six (6) sampled boreholes. Four (4) representative samples were submitted for chemical analysis and results were compared with the applicable MOEE Table B Standard. S&P's borehole investigation indicated that the tested soils had not been adversely impacted by the presence of heavy metals or PAHs. Elevated levels of EC and SAR were noted on the site. When considering residential land use criteria, an elevated concentration of TPH-heavy oils was also noted in the central portion of the area of investigation in addition to the elevated EC and SAR. The report noted that at the locations where elevated concentrations of heavy oils, arsenic, and/or cobalt were identified, soil remediation would be required in order to meet current MOEE criteria. If the site use remains commercial/industrial in nature, no remediation of the soils in the vicinity of S&P's boreholes appears warranted. However, during test pitting completed by MMM (1993), elevated concentrations of heavy oils were noted at MMM's TP5 and elevated arsenic was noted at MMM's TP11 and were suspected at TP12. These soils would require removal to meet applicable MOEE Table B Standards. If the site is to be redeveloped for residential land use, remediation of soils containing elevated heavy oils in S&P's BH4 as well as heavy oils and trace metals at various MMM test pit locations would be required. It appeared that the majority of the impacted soils are within the upper 0.5 to 1.5 m of fill.

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
Draft Phase II Environmental Site Assessment-480 Lakeshore Boulevard East, Toronto, Ontario	2006	Golder Associates Ltd.	Toronto Waterfront Revitalization Corporation	Golder Associates Ltd. ("Golder") was retained by the Toronto Waterfront Revitalization Corporation ("TWRC") to conduct a Phase II Environmental Site Assessment ("ESA") of the property located at 480 Lakeshore Boulevard East, in the City of Toronto, Ontario. The primary objective of the intrusive investigations described herein is to characterize the subsurface conditions at the Site as follows. The scope of work of the Phase II ESA included: • Excavating thirteen (13) test pits to a maximum depth of to 2.1 mbgs; • Drilling fifteen (15) boreholes to a maximum depth of 8.5 mbgs; • Equipping each borehole drilled at the Site with a groundwater monitoring well; and • Collecting soil and groundwater samples for subsequent chemical analyses of one, or more of the following parameters: heavy metals, volatile organic compounds (VOCs), petroleum hydrocarbons (fractions F1 through F4), semi-volatile organic compounds and polychlorinated biphenyls (PCBs). The key findings of the Phase II ESA are: • Soil samples retrieved from within fill material unit at the Site were visually impacted with petroleum hydrocarbons and were characterized as emanating faint to very strong petroleum hydrocarbons odours when handled. • Soil underlying the site is impacted with respect to heavy metals, petroleum hydrocarbons and semi-volatile organic compounds. • The groundwater underlying the site is impacted with petroleum hydrocarbons and semivolatile organic compounds. Golder encountered light non-aqueous phase liquid (LNAPL) in four groundwater wells installed at the Site in this investigation. The thickness of LNAPL measured in groundwater monitoring well installed during this assessment ranged from less than 1 cm to 97 cm. • There appears to be a potential for migration of contaminants onto and off the Site. The presence of LNAPL in groundwater monitoring wells installed along the central portion of the Site suggests that free product may be migrating onto the municipal roadway that separates the western and central portions of the Site. • None of the three (3) composite soil samples that were subjected to Toxicity Characteristic Leaching Procedure analyses in this Phase II ESA are considered to be hazardous according to Ontario Regulation 558. As such, these soil samples could be classified as non-hazardous material for off-Site disposal.
Phase III Environmental Site Assessment (ESA)-150 Commissioners Street, Toronto, Ontario	June 1995	ADAMAS Environmental Inc.	CP Rail Systems Properties Group	ADAMAS Environmental Inc. was retained by CP Rail System Properties Group to conduct a Phase I Environmental Site Assessment of the subject property. At the time the report was written the subject property collectively known as 150 Commissioners Street in Toronto, Ontario consisted of four parcels of land with the following civic addresses; 150 Commissioners Street, and 105, 155, 165 Villiers Street. The scope of work undertaken for this report consisted of the following tasks:

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				1) Review, assessment and interpretation of all previous investigative work performed at the site (including Phase I and II ESAs completed by Golder [1992], DCS Remedial Evaluation [1994] and ADAMAS supplementary ESA [1995]); 2) Identification of areas of current and historical potential environmental concern at the site; 3) Identification of parameters indicative of soil impact at the site; 4) Identification of the remediation criteria to be used at the site, drawn from existing and proposed provincial and federal guidelines, and; 5) Quantification of the general soil quality across the site. On the basis of the findings of the previous environmental assessment work carried out by Golder and DCS at 150 Commissioners Street in conjunction with ADAMAS's supplementary subsurface investigation, the following conclusions were reached: • A total of seventeen storage tanks which contain various petroleum products are present at the site and should be removed in order to eliminate the major sources of contamination at this site. • The relevant criteria used to assess the materials at the site were: – Level II Site Sensitivity criteria listed in the MOEE Interim Guidelines for the Assessment and Management of Petroleum Contaminated Sites in Ontario, (August, 1993); – Surface and Subsurface criteria for Industrial/Commercial land use listed on tables B and D in the Proposed MOEE Guidelines for the Clean-up of Contaminated Sites in Ontario (DRAFT), (July, 1994). • The estimated maximum quantity of soil impacted by organic (TPH, BTEX, PAHs, VOCs) parameters in excess of the above noted criteria is on the order of 34,070 cubic meters. • The estimated maximum quantity of soils impacted by inorganic (Arsenic) parameters which exceed the above noted criteria is on the order of 500 cubic meters. • The soils identified above (total of 34,565 cubic meters) should be remediated or removed from the site so that all remaining soils meet the relevant criteria. • Possible remedial measures for the materials impacted by organic contaminants included: (1) Excavate and dispose impacted soils at a landfill and Backfill excavations with clean fill. (2) Excavate and remediate soils ex-situ and Backfill excavations with remediated fill. (3) Treat soils in-situ techniques. (4) Manage contamination on-site.
Biopile Soil Sampling Summary Report-Villiers Street Biopile Area	June 3, 2009	Jacques Whitford Stantec Limited	Toronto Economic Development Corporation	Jacques Whitford Stantec Limited (JWSL) prepared a report to document the soil sampling activities from the biopile rows situated on the Villiers Street site, situated on the TEDCO lands west of Don Roadway Street and south of Villiers Street, in the City of Toronto. The biopiles that existed on the site were comprised of petroleum hydrocarbon (PHC) impacted soils imported from a TEDCO source site. Jacques Whitford conducted interim sampling and testing activities of the soil following mixing and amendment addition of the biopile rows situated on the Villiers Street site to determine the effectiveness of the biopile facility to bioremediate petroleum impacted soil to concentrations

Table 3-1. Investigation Summary

Port Lands, Toronto, ON

Report Title	Date	Author	Prepared for	Description
				below MOE Table 3 Standards. Based on the soil analytical results to date, the following conclusions were provided: • Bioremediation activities of the petroleum impacted soil at the Villiers Street Biopile Area effectively reduced the original concentrations of petroleum hydrocarbons. • Approximately 60% of the 31,750 cubic meters (63,500 tonnes) of soils within the biopile rows satisfied the Table 3 Standards for BTEX and PHC fractions F1 to F4. It was recommended that the "clean"-remediated soil (i.e. below Table 3 Standards) and the "dirty" soil be segregated into two separate stockpiles. The "clean"-remediated soil was to be left in a stockpile and awaited transfer and deposition in the near future to another TEDCO property within the Port Lands where fill was required and the Table 3 Standards were applicable. The remaining petroleum impacted soil was to be placed into new biopile rows and mixed with surfactant and nutrients to further enhance the bioremediation process.
Port Lands Environmental, Geotechnical, and Hydrogeological Investigation, Port Lands, Toronto, Ontario	September 15, 2015	GHD	Waterfront Toronto	The most recent soil and groundwater quality sampling data available for the Port Lands was obtained by GHD as part of the Stage 1 of the Environmental, Geotechnical, and Hydrogeological Investigation that is currently underway (GHD, 2015). Soil sampling activities were completed between July 28 and August 27, 2015. 297 soil samples were collected during Stage 1 (including field duplicates and trip blanks) and submitted for laboratory analysis of one or more of the following: VOCs, PHCs, PAHs, and metals and inorganics. The soil analytical results were compared to MOECC Table 7 and Table 9 Standards. Based on the analytical results, soil samples submitted for laboratory analysis had concentrations of VOCs, PHCs, PAHs, and metals and inorganics above the MOECC Table 7 and/or 9 Standards. The soil impacts were generally limited to the upper 4 to 6 metres of soil. Of the 46 boreholes advanced within the proposed valley excavation area, 37 boreholes had concentrations above the MOECC Table 7 and/or 9 Standards for at least one of the parameters analyzed. During the Stage 1 field activities, there was no evidence of free product on any soils encountered. As of August 27, 2015, approximately 72 groundwater monitoring wells were installed during Stage 1, consisting of 11 bedrock wells and 61 overburden wells (11 wells to 10 mbgs, 25 wells to 7 mbgs, and 25 wells to 3 mbgs). GHD collected groundwater samples from each of the newly installed monitoring wells installed during Stage 1 for analysis of VOCs, PHCs, PAHs, and metals and inorganics. GHD indicated that there was no evidence of light non-aqueous phase liquid (LNAPL) or dense non-aqueous phase liquid (DNAPL) at the monitoring wells sampled during Stage 1 (GHD, 2015). Based on the Stage 1 results, GHD indicated that all groundwater samples submitted for laboratory analysis had concentrations of metals and inorganics below the MOECC Table 7 and 9 Standards. While, VOCs, PHCs, and PAHs were detected at concentrations above the MOECC Table 7 and/or 9 Standards at several locations. GHD noted that groundwater impacts were typically limited to the monitoring wells screened between 3 and 7 mbgs and that there was no evidence of groundwater impacts at the bedrock monitoring wells.

Table 5-1. Data Gaps

Data Gap	Issue	Details
Database-related Gaps	Information to be obtained to determine if there are more relevant COCs	The compiled database did not include the following investigations: - Sitewide groundwater sampling in 2013 (DCS,2014) - Phase Two ESA data from CRA (2014) for 312 Cherry Street - Groundwater data from the Golder (2012) investigation (resampling existing wells) for 281 Cherry Street - Soil and groundwater data from the Adamas investigations (1995a;1995b) for 105-165 Villiers Street, 150 Commissioners Street - Soil data from DCS investigation (DCS, 1997) and UST removal (DCS, 1998) for 105-165 Villiers Street, 150 Commissioners Street - Soil and groundwater data in database from Golder (1990), P&R (1992) and Golder (1991) from 85 to 94 Commissioners Street - Soil and groundwater data in database from Dames & Moore Canada (1994) for 97 Commissioners Street - Soil data from the 1998 V.A. Wood and 1992 DSC investigations for 80 Commissioners Street (locations referenced in DCS (2002) - Soil and groundwater data in database from DCS (2000) investigation and missing groundwater data from CRA (2011) for 75 Commissioners Street - Soil data for DCS (2007b) investigation at 99 Commissioners
	Information to be obtained to determine if there are additional APECs	Data are included in the provided database for an MTE investigation in 2008 on 309 Cherry Street; however, no report was made available for review to interpret and verify results.
		Data are provided for a Terrapex investigation in 2004; however, no report was made available for review to interpret and verify results.
APEC Gaps	Missing historical land use/no previous sampling information; to be obtained to determine if there are additional APECs	No historical or current sampling data provided, or investigations completed, for these addresses: - 175-190 Cherry Street - 1-63 Polson Street - 50-72 Polson Street - 185 Villiers Street
	Information to be obtained to determine if there are additional APECs	Approximately 73 APECs did not have associated sampling conducted to confirm the presence or absence of contaminants of concern. Additionally, 12 APECs have soil but no groundwater investigated.
	Information to be obtained to determine if there are additional APECs	Data are included in the provided database for an MTE investigation in 2008 on 309 Cherry Street; however, no report was made available for review to interpret and verify results. Data are provided for a Terrapex investigation in 2004; however, no report was made available for review to interpret and verify results.
COC and RA Model Gaps	NAPL, soil/groundwater data outside of GHD investigation areas	LNAPL presence/absence and soil and groundwater characterization data in areas outside the GHD investigation areas, especially where the free-phase threshold or ½ solubility is exceeded and there have been historical reports of NAPL (i.e., 309 Cherry Street, 480 Lakeshore Blvd E, 54 Commissioners Street, 75 Commissioners Street, 105 Villiers Street, Block from 21-63 Commissioners, including 181/185 Cherry Street, and 130 Commissioners Street). Areas outside the river valley and not being targeted would need to be further investigated to confirm concentrations and the need for remediation (if above IV) to properly estimate soil volumes and remediation costs.
	Elevated pH	In areas where soil pH was found to be elevated (22 locations), future revitalization activities will need to consider whether additional sampling will be warranted to determine whether the elevated pH is truly representative of site conditions and whether Table 1 Standards will be applicable; whether the elevated pH is localized or anomalous; or whether, through the allowable provisions under O. Reg. 153/04 regarding averaging, it is determined to be within range.
	Extent of NAPL, Depth of Contamination in the Former Imperial Oil lands	There are insufficient data within the Imperial Oil lands to confirm the depth of the contamination. Based on most historical data, the extent is potentially limited to 3.5 mbgs; however, one or two samples suggest the contamination extends deeper in areas, to 9 mbgs. The depth of excavation required for river valley construction is assumed to be

Table 5-1. Data Gaps

Data Gap	Issue	Details
		sufficient to remove the contamination in these lands. No overexcavation is assumed. Additional testing was completed in fall 2015 to address much of this data gap. These new data will be evaluated during the CBRA.
	Dredgeate in River Valley Mouth	No environmental or geotechnical information is available for the sediment and soil in the River Valley Mouth (between Polson and Cousins Quay). CH2M has assumed the sediment and soil excavated in the open water can be reused as barrier material (once it is dewatered). Geotechnical testing including consolidation testing performed on the collected undisturbed samples will be required.
	West of Cherry Street	Vinyl chloride west of Cherry Street is currently of unknown origin. Need to evaluate further to confirm that maximum concentration has been identified.
	High PAH areas	Source and extent of contamination unknown. Need to evaluate further to confirm that maximum concentration has been identified.
	Villiers Street	Source and extent of chlorinated solvent contamination unknown. Need to evaluate further to confirm that maximum concentration has been identified.
	Site-wide	Soil FOC data in saturated and nonsaturated and from noncontaminated areas has recently become available to help support developing site-specific criteria and will be incorporated into the CBRA.
		Confirming Soil to Outdoor air component value exceedances – especially those in the development blocks that are in the unsaturated zone. Presently, assumptions are being made that the values are not real and these areas are not being targeted for remediation
Groundwater Elevation Data	Site-Wide	Current groundwater snap shot has limited coverage; no areas outside the GHD investigation area. Additional groundwater level information for all available monitoring wells in the CBRA Area was collected in the fall of 2015 and just provided to CH2M on January 4, 2016. We understand that many of the historical monitoring wells are no longer present and gaps in the coverage may remain.
Reuse of Fill	Site-wide	Debris such as brick, cinders, cobbles, pebbles, shale, etc. is noted in borehole logs. It is likely and has been assumed that the excavated fill will need to be screened. The percentage of overs and the reuse options for the oversized material has been assumed to be minimal. Approximately 20% (by volume) of the fill excavated in the river valley construction has been assumed to require disposal off site. There may be alternatives for this soil, but until additional test pits and pilot-test screening of the fill is done, this remains a data gap.
	Cousins Quay	Soil in Cousins Quay assumed reusable. More specific testing at depth.
Remediation and RMM	Sitewide	The ability of a soil-washing system and bioremediation to treat the highly contaminated PHC-impacted soil to S-GW3 treatment criteria has not been proven. Pilot-scale testing should be completed.
	Hazardous Waste	Hazardous waste has not been identified in the CBRA Area. The assumption that all material is nonhazardous should be confirmed (particularly for the locations with elevated lead concentrations).
	Stabilization techniques	The ability of RMMs to control NAPL migration if required is to be tested through bench scale and field scale testing.

Notes:
CRA - Conestoga-Rovers & Associates
DCS - Decommissioning Consulting Services
FOC - fraction of organic carbon
GHD - GHD Limited
Golder - Golder Associates, Limited
LNAPL - light nonaqueous phase liquid
mbgs - metre below ground surface
P&R - Proctor and Redfern Limited
PAH - polycyclic aromatic hydrocarbon
PHC - petroleum hydrocarbon
Terrapex - Terrapex Environmental Ltd.
UST - underground storage tank

Table 6-1. Summary of Hydraulic Conductivity

Hydrostratigraphic Unit	Hydraulic Conductivity (m/sec)		
	Minimum	Maximum	Geometric mean
Fill (Sand)	2.21×10^{-6}	8.75×10^{-4}	1.45×10^{-4}
Fill (Silt and Clay)	1.49×10^{-7}	7.49×10^{-6}	2.86×10^{-6}
Organics Layers	3.64×10^{-7}	1.68×10^{-4}	8.71×10^{-6}
Native Sand Aquifer	1.77×10^{-4}	8.70×10^{-4}	3.59×10^{-4}
Upper Weathered Bedrock Aquifer	8.87×10^{-7}	3.21×10^{-5}	8.21×10^{-6}

Table 6-2. Groundwater Elevation Measurements

Port Lands, Toronto, ON

Well No.	Depth to bottom	Sandpack Interval		Lithology Screened	Ground Elevation	Reference Elevation[a]	Groundwater Elevations		
		Top	Bottom				September 1, 2015		
	(mbgs)	(mbgs)	(mbgs)		(masl)	(masl)	(mbtor)	(mbgs)	(masl)
MW1A-15	7.47	4.12	7.47	Sand (NATIVE)	77.32	77.25	2.03	2.11	75.22
MW1B-15	3.05	1.22	3.05	Sand (FILL)	77.29	77.21	2.03	2.11	75.18
MW2A-15	7.47	4.12	7.47	Sand (NATIVE)	77.41	77.33	2.16	2.24	75.17
MW2B-15	-	-	-	-	77.40	77.32	2.16	2.25	75.16
MW3A-15	7.62	3.96	7.62	Sand (NATIVE)	76.67	76.60	1.41	1.48	75.19
MW3B-15	3.05	1.22	3.05	Sand Native/Sand (FILL)	76.70	76.59	1.40	1.51	75.19
MW5A-15	6.86	3.20	6.86	Sand and Gravel (FILL)	76.92	76.82	1.72	1.83	75.10
MW5B-15	3.05	1.22	3.05	Sand and Gravel (FILL)	76.93	76.81	1.71	1.83	75.10
MW6A-15	7.32	3.05	7.32	Sand (NATIVE)	76.61	76.55	1.39	1.45	75.16
MW6B-15	-	-	-	-	76.64	76.57	1.40	1.47	75.17
MW7A-15	7.62	3.96	7.62	Sand (NATIVE)	76.29	76.20	1.03	1.12	75.17
MW7B-15	-	-	-	-	76.28	76.21	1.03	1.10	75.18
MW8A-15	6.10	2.44	6.10	Silty Clay (FILL)/Silty Sand (NATIVE)	76.48	76.40	1.24	1.32	75.16
MW8B-15	3.05	1.22	3.05	Silty Clay (FILL)	76.47	76.37	1.21	1.32	75.16
MW9A-15	7.47	3.81	7.47	Clayey Silt/Sand/Gravelly Sand (FILL)	76.87	76.76	1.61	1.72	75.15
MW9B-15	3.05	1.22	3.05	Sand and Gravel/Sand (FILL)	76.87	76.75	1.45	1.57	75.30
MW10A-15	7.32	3.66	7.32	Sand and Gravel/Sand (FILL)	76.35	77.27	2.16	1.24	75.11
MW10B-15	3.05	1.22	3.05	Sand/Sand with Silt/Sand and Gravel (FILL)	76.34	77.29	2.16	1.21	75.13
MW18A-15	7.47	3.81	7.47	Peat/Clayey Silt and Peat/Sand (NATIVE)	77.06	76.94	1.82	1.93	75.12
MW18B-15	3.05	1.22	3.05	Sand (FILL)	77.09	76.98	1.78	1.89	75.20
MW20A-15	7.01	3.96	7.01	Silt/Organic Silt and Clay/Sand/Silt/Peat/Sand/Silt (NATIVE)	76.70	77.71	2.56	1.55	75.15
MW20B-15	-	-	-	-	76.72	77.87	2.60	1.45	75.27
MW21A-15	9.15	5.49	9.15	Silty Clay/Sand and Silt/Silty Clay/Silt/Sand (NATIVE)	79.54	80.41	5.29	4.42	75.12
MW21B-15	6.10	4.27	6.10	Silty Sand (FILL)/Silty Clay (NATIVE)	79.56	80.43	4.56	3.69	75.87
MW23A-15	9.76	6.10	9.76	Peat/Sand (NATIVE)	79.98	80.89	5.79	4.87	75.10
MW23B-15	6.10	4.27	6.10	Sand and Silt/Silty Clay (FILL)	80.05	81.00	5.73	4.78	75.27
MW25A-15	10.06	6.34	10.06	Clayey Sand/Silty Clay/Clayey Sand (FILL)	79.08	80.02	4.96	4.03	75.06
MW25B-15	5.03	1.65	5.03	Gravel and Shale/Topsoil with Sand/Silty Clay/Silty Sand/Clayey Sand (FILL)	79.09	80.09	4.92	3.92	75.17
MW26A-15	19.82	16.46	19.82	Bedrock	76.75	77.59	2.71	1.88	74.88
MW26B-15	8.84	5.18	8.84	Sand (NATIVE)	76.73	77.64	2.52	1.61	75.12
MW26C-15	6.71	3.05	6.71	Sand Fill/Sand (NATIVE)	76.66	77.57	2.45	1.54	75.12
MW26D-15	3.05	1.22	3.05	Sand/Silty Sand (FILL)	76.65	77.59	2.48	1.54	75.11
MW27A-15	21.49	17.68	21.49	Bedrock	77.41	77.27	2.25	2.40	75.02
MW27B-15	10.67	7.01	10.67	Sand (NATIVE)	76.85	76.77	1.61	1.69	75.16
MW27C-15	6.10	2.44	6.10	Silt to Clayey Silt (FILL)/Silty Clay/Sand (NATIVE)	76.85	76.77	1.66	1.75	75.11
MW27D-15	3.05	1.22	3.05	Gravelly Sand/Silty Clay/Silt to Clayey Silt (FILL)	76.88	76.79	1.29	1.38	75.50
MW30A-15	24.80	21.14	24.80	Bedrock	77.07	78.05	2.89	1.90	75.16
MW30B-15	10.06	6.40	10.06	Sand Native	77.11	78.05	2.95	2.01	75.10
MW30C-15	6.10	2.44	6.10	Silty Clay/Peat/Silt (NATIVE)	77.15	78.16	2.95	1.95	75.21
MW30D-15	3.05	1.52	3.05	Sand/Silty Clay (FILL)	77.18	78.23	3.00	1.94	75.23
MW31A-15	24.17	20.43	24.17	Bedrock	80.03	81.06	6.04	5.01	75.02
MW31B-15	13.72	10.05	13.72	Sand and Gravel/Sand (NATIVE)	80.03	81.09	5.97	4.91	75.12
MW31C-15	10.37	6.71	10.37	Silty Clay/Sandy Silt/Silty Sand/Sand (FILL)	80.03	81.08	5.96	4.91	75.12
MW31D-15	6.10	4.27	6.10	Clayey Silt/Peat (NATIVE)	79.99	81.07	5.27	4.19	75.80
MW32A-15	20.12	16.46	20.12	Bedrock	76.93	76.87	1.74	1.80	75.13
MW32B-15	10.67	7.01	10.67	Sand (NATIVE)	77.00	76.96	1.83	1.87	75.13

Table 6-2. Groundwater Elevation Measurements

Port Lands, Toronto, ON

Well No.	Depth to bottom	Sandpack Interval		Lithology Screened	Ground Elevation	Reference Elevation[a]	Groundwater Elevations		
		Top	Bottom				September 1, 2015		
	(mbgs)	(mbgs)	(mbgs)		(masl)	(masl)	(mbtor)	(mbgs)	(masl)
MW32C-15	7.01	3.35	7.01	Peat/Silt (NATIVE)	77.03	76.90	1.79	1.92	75.11
MW32D-15	3.05	1.52	3.05	Silt/Sand/Silt (FILL)	77.07	77.02	0.96	1.01	76.06
MW34A-15	21.20	17.38	21.20	Bedrock	79.02	80.12	5.12	4.01	75.00
MW34B-15	13.72	10.06	13.72	Sand Fill/Silty Sand (NATIVE)	79.08	80.10	4.97	3.95	75.13
MW34C-15	10.67	7.01	10.67	Peat/Silty Clay (NATIVE)	79.11	80.14	5.02	3.99	75.12
MW34D-15	6.10	4.27	6.10	Gravelly Sand/Silt (FILL)	79.12	80.16	5.36	4.32	74.80
MW35A-15	23.02	19.36	23.02	Bedrock	77.17	77.10	1.96	2.03	75.14
MW35B-15	9.76	6.10	9.76	Peat/Silty Clay (NATIVE)	80.07	80.97	5.85	4.96	75.12
MW35C-15	6.10	4.27	6.10	Silty Clay (FILL)	80.07	80.98	5.10	4.19	75.88
MW35D-15*	12.80	9.15	12.80	Sand (FILL)	80.07	80.84	5.72	4.94	75.12
MW36A-15	21.54	17.68	21.54	Bedrock	76.43	76.32	1.26	1.37	75.06
MW36B-15	10.67	7.01	10.67	Sand (NATIVE)	76.49	76.41	1.23	1.31	75.18
MW36C-15	6.10	2.44	6.10	Sand (NATIVE)	76.45	76.36	1.19	1.28	75.17
MW36D-15	3.05	1.22	3.05	Sand (FILL)/Sand (NATIVE)	76.47	76.40	1.21	1.28	75.19
MW37A-15**	23.10	19.51	23.10	Bedrock	76.46	76.27	1.85	2.03	74.42
MW37B-15	10.67	7.01	10.67	Sand (FILL)	76.45	76.38	1.22	1.29	75.16
MW37C-15	7.62	3.96	7.62	Sand (FILL)	76.45	76.37	1.22	1.30	75.15
MW37D-15	3.05	1.52	3.05	Sand to Sandy Silt Fill/Sand (FILL)	76.45	76.38	1.22	1.28	75.16
MW39A-15	15.85	12.20	15.85	Bedrock	76.51	77.49	2.39	1.42	75.10
MW39B-15	10.67	7.01	10.67	Silty Clay/Silty Sand/Gravelly Sand/Shale (NATIVE)	76.50	77.48	2.36	1.38	75.12
MW39C-15	7.62	3.96	7.62	Peat/Silty Clay (NATIVE)	76.54	77.58	2.45	1.41	75.13
MW39D-15	3.05	1.22	3.05	Sand/Silty Clay/Peat (NATIVE)	76.55	77.52	2.41	1.44	75.11
MW40A-15	16.24	12.59	16.24	Bedrock	76.81	77.69	2.54	1.66	75.15
MW40B-15	10.57	7.01	10.57	Silty Sand/Sand (FILL)	76.89	77.72	2.57	1.74	75.15
MW40C-15	6.10	2.44	6.10	Silt/Sandy Silt/Silt/Sandy Silt (FILL)	76.90	77.66	2.43	1.67	75.23
MW40D-15	3.05	1.22	3.05	Gravel Fill/Clay (FILL)	76.93	77.81	2.39	1.51	75.42

Notes:

[a] Reference elevation taken from top of riser pipe.

* Elevations for MW35D-15 are approximate and require confirmation.

** Monitoring well casing damaged. Monitoring well to be repaired.

masl metres above sea level. Elevations referenced with respect to benchmark

mbgs metres below ground surface

mbtor metres below top of riser

Table 6-3. Vertical Hydraulic Gradients and Groundwater Flow Velocities

Waterfront Toronto - Port Lands

Well No.	Easting	Northing	Depth to bottom	Sandpack Interval		Lithology Screened	Ground Elevation	Top of Riser Pipe Elevation	Bottom of Well	Groundwater Elevations			Vertical Hydraulic Gradient	Vertical Hydraulic Gradient Direction	Horizontal Hydraulic Conductivity (K_h)	Vertical Hydraulic Conductivity (K_z)	Effective Porosity	Vertical Groundwater Flow Velocity
				Top	Bottom					*September 1, 2015*								
			(mbgs)	(mbgs)	(mbgs)		(mAMSL)	(mAMSL)	(mAMSL)	(mBTOR)	(mbgs)	(mAMSL)	(m/m)		(m/day)	(m/day)	(%)	(m/year)
MW1B-15	316316.706	4833463.137	3.05	1.22	3.05	Sand (FILL)	77.293	77.211	74.243	2.03	2.112	75.181			57.37	5.74	0.35	
MW1A-15	316316.59	4833463.645	7.47	4.12	7.47	Sand (NATIVE)	77.321	77.245	69.851	2.03	2.106	75.215	-0.008	Upward Gradient	15.28	1.53	0.35	*12*
MW2B-15	#N/A	#N/A	-	-	-	-	77.402	77.316		2.16	2.246	75.156						
MW2A-15	316384.318	4833402.943	7.47	4.12	7.47	Sand (NATIVE)	77.405	77.326	69.935	2.16	2.239	75.166			41.14	4.11	0.35	
MW3B-15	316424.903	4833586.996	3.05	1.22	3.05	Sand Native/Sand (FILL)	76.699	76.59	73.649	1.4	1.509	75.19			41.14	4.11	0.35	
MW3A-15	316425.275	4833586.222	7.62	3.96	7.62	Sand (NATIVE)	76.668	76.603	69.048	1.41	1.475	75.193	-0.001	Upward Gradient	41.14	4.11	0.35	*3*
MW5B-15	316587.538	4833403.558	3.05	1.22	3.05	Sand and Gravel (FILL)	76.925	76.807	73.875	1.71	1.828	75.097			118.71	11.87	0.30	
MW5A-15	316587.055	4833404.278	6.86	3.2	6.86	Sand and Gravel (FILL)	76.924	76.817	70.064	1.72	1.827	75.097	0.000	Downward Gradient	18.23	1.82	0.30	*0*
MW6B-15	#N/A	#N/A	-	-	-	-	76.636	76.57		1.4	1.466	75.17						
MW6A-15	316602.702	4833628.429	7.32	3.05	7.32	Sand (NATIVE)	76.605	76.546	69.285	1.39	1.449	75.156			41.14	4.11	0.35	
MW7B-15	#N/A	#N/A	-	-	-	-	76.281	76.21		1.03	1.101	75.18			9.33	0.93		
MW7A-15	316558.651	4833508.601	7.62	3.96	7.62	Sand (NATIVE)	76.288	76.198	68.668	1.03	1.12	75.168			41.14	4.11	0.35	
MW8B-15	316422.349	4833284.858	3.05	1.22	3.05	Silty Clay (FILL)	76.474	76.367	73.424	1.21	1.317	75.157			0.54	0.05	0.20	
MW8A-15	316422.025	4833285.829	6.1	2.44	6.1	Silty Clay (FILL)/Silty Sand (NATIVE)	76.482	76.404	70.382	1.24	1.318	75.164	-0.002	Upward Gradient	18.85	1.89	0.30	*5*
MW9B-15	316688.78	4833597.613	3.05	1.22	3.05	Sand and Gravel/Sand (FILL)	76.866	76.745	73.816	1.45	1.571	75.295			3.44	0.34	0.30	
MW9A-15	316689.279	4833596.82	7.47	3.81	7.47	Clayey Silt/Sand/Gravelly Sand (FILL)	76.873	76.762	69.403	1.61	1.721	75.152	0.032	Downward Gradient	18.85	1.89	0.30	*74*
MW10B-15	316422.616	4833781.784	3.05	1.22	3.05	Sand/Sand with Silt/Sand and Gravel (FILL)	76.335	77.285	73.285	2.16	1.21	75.125			18.85	1.89	0.30	
MW10A-15	316423.718	4833782.056	7.32	3.66	7.32	Sand and Gravel/Sand (FILL)	76.347	77.27	69.027	2.16	1.237	75.11	0.004	Downward Gradient	3.44	0.34	0.30	*1*
MW18B-15	317094.484	4833902.021	3.05	1.22	3.05	Sand (FILL)	77.093	76.98	74.043	1.78	1.893	75.2			57.37	5.74	0.35	
MW18A-15	317094.185	4833901.238	7.47	3.81	7.47	Peat/Clayey Silt and Peat/Sand (NATIVE)	77.056	76.941	69.586	1.82	1.935	75.121	0.018	Downward Gradient	45.20	4.52	0.35	*84*
MW20B-15	#N/A	#N/A	-	-	-	-	76.723	77.869		2.6	1.454	75.269						
MW20A-15	317128.801	4834166.075	7.01	3.96	7.01	Silt/Organic Silt and Clay/Sand/Silt/Peat/Sand/Silt (NATIVE)	76.699	77.713	69.689	2.56	1.546	75.153			0.54	0.05	0.30	
MW21B-15	317254.528	4833832.316	6.1	4.27	6.1	Silty Sand (FILL)/Silty Clay (NATIVE)	79.557	80.425	73.457	4.56	3.692	75.865			18.85	1.89	0.30	
MW21A-15	317254.928	4833831.506	9.15	5.49	9.15	Silty Clay/Sand and Silt/Silty Clay/Silt/Sand (NATIVE)	79.544	80.411	70.394	5.29	4.423	75.121	0.243	Downward Gradient	0.54	0.05	0.30	*16*
MW23B-15	317249.74	4833950.497	6.1	4.27	6.1	Sand and Silt/Silty Clay (FILL)	80.045	80.996	73.945	5.73	4.779	75.266			0.54	0.05	0.30	
MW23A-15	317249.459	4833951.693	9.76	6.1	9.76	Peat/Sand (NATIVE)	79.977	80.893	70.217	5.79	4.874	75.103	0.044	Downward Gradient	45.20	4.52	0.35	*206*
MW25B-15	317621.77	4833906.845	5.03	1.65	5.03	Gravel and Shale/Topsoil with Sand/Silty Clay/Silty Sand/Clayey Sand (FILL)	79.086	80.085	74.056	4.92	3.921	75.165			18.85	1.89	0.30	
MW25A-15	317622.539	4833905.745	10.06	6.34	10.06	Clayey Sand/Silty Clay/Clayey Sand (FILL)	79.083	80.016	69.023	4.96	4.027	75.056	0.022	Downward Gradient	0.54	0.05	0.30	*1*
MW26D-15	316488.198	4833819.079	3.05	1.22	3.05	Sand/Silty Sand (FILL)	76.652	77.592	73.602	2.48	1.54	75.112			18.85	1.89	0.35	
MW26C-15	316489.528	4833819.823	6.71	3.05	6.71	Sand Fill/Sand (NATIVE)	76.659	77.569	69.949	2.45	1.54	75.119	-0.002	Upward Gradient	57.36	5.74	0.35	*11*
MW26B-15	316490.43	4833820.486	8.84	5.18	8.84	Sand (NATIVE)	76.726	77.635	67.886	2.52	1.611	75.115	0.002	Downward Gradient	41.14	4.11	0.35	*8*
MW26A-15	316493.68	4833822.637	19.82	16.46	19.82	Bedrock	76.752	77.586	56.932	2.71	1.876	74.876	0.022	Downward Gradient	1.87	0.19	0.02	*74*
MW27D-15	316512.645	4833307.524	3.05	1.22	3.05	Gravelly Sand/Silty Clay/Silt to Clayey Silt (FILL)	76.875	76.787	73.825	1.29	1.378	75.497			18.85	1.89	0.20	
MW27C-15	316511.869	4833306.818	6.1	2.44	6.1	Silt to Clayey Silt (FILL)/Silty Clay/Sand (NATIVE)	76.854	76.766	70.754	1.66	1.748	75.106	0.127	Downward Gradient	0.54	0.05	0.30	*8*
MW27B-15	316511.15	4833306.518	10.67	7.01	10.67	Sand (NATIVE)	76.846	76.77	66.176	1.61	1.686	75.16	-0.012	Upward Gradient	41.14	4.11	0.35	*51*
MW27A-15	316331.998	4833623.924	21.49	17.68	21.49	Bedrock	77.411	77.265	55.921	2.25	2.396	75.015	0.014	Downward Gradient	2.78	0.28	0.02	*72*
MW30D-15	317425.825	4833744.384	3.05	1.52	3.05	Sand/Silty Clay (FILL)	77.175	78.232	74.125	3	1.943	75.232			0.54	0.05	0.35	
MW30C-15	317424.528	4833743.602	6.1	2.44	6.1	Silty Clay/Peat/Silt (NATIVE)	77.154	78.156	71.054	2.95	1.948	75.206	0.008	Downward Gradient	45.20	4.52	0.40	*35*
MW30B-15	317423.35	4833742.904	10.06	6.4	10.06	Sand Native	77.106	78.05	67.046	2.95	2.006	75.1	0.026	Downward Gradient	41.14	4.11	0.35	*113*
MW30A-15	317422.446	4833742.345	24.8	21.14	24.8	Bedrock	77.065	78.053	52.265	2.89	1.902	75.163	-0.004	Upward Gradient	1.87	0.19	0.02	*15*
MW31D-15	317269.883	4833918.045	6.1	4.27	6.1	Clayey Silt/Peat (NATIVE)	79.993	81.069	73.893	5.27	4.194	75.799			0.42	0.04	0.4	
MW31C-15	317269.34	4833918.85	10.37	6.71	10.37	Silty Clay/Sandy Silt/Silty Sand/Sand (FILL)	80.032	81.081	69.662	5.96	4.911	75.121	0.160	Downward Gradient	0.54	0.05	0.3	*11*
MW31B-15	317268.125	4833917.064	13.72	10.05	13.72	Sand and Gravel/Sand (NATIVE)	80.03	81.092	66.31	5.97	4.908	75.122	0.000	Upward Gradient	118.71	11.87	0.35	*4*
MW31A-15	317267.52	4833917.962	24.17	20.43	24.17	Bedrock	80.032	81.064	55.862	6.04	5.008	75.024	0.009	Downward Gradient	1.87	0.19	0.02	*32*
MW32D-15	317454.85	4834075.463	3.05	1.52	3.05	Silt/Sand/Silt (FILL)	77.074	77.021	74.024	0.96	1.013	76.061			0.54	0.05	0.3	
MW32C-15	317455.497	4834074.313	7.01	3.35	7.01	Peat/Silt (NATIVE)	77.03	76.896	70.02	1.79	1.924	75.106	0.239	Downward Gradient	45.20	4.52	0.4	*984*
MW32B-15	317456.236	4834073.08	10.67	7.01	10.67	Sand (NATIVE)	76.998	76.962	66.328	1.83	1.866	75.132	-0.007	Upward Gradient	41.14	4.11	0.35	*30*
MW32A-15	317456.517	4834071.838	20.12	16.46	20.12	Bedrock	76.929	76.865	56.809	1.74	1.804	75.125	0.001	Downward Gradient	1.87	0.19	0.02	*3*
MW34D-15	317222.144	4833996.185	6.1	4.27	6.1	Gravelly Sand/Silt (FILL)	79.119	80.158	73.019	5.36	4.321	74.798			3.44	0.34	0.3	
MW34C-15	317223.071	4833996.755	10.67	7.01	10.67	Peat/Silty Clay (NATIVE)	79.105	80.136	68.435	5.02	3.989	75.116	-0.069	Upward Gradient	45.20	4.52	0.4	*286*
MW34B-15	317224.159	4833997.58	13.72	10.06	13.72	Sand Fill/Silty Sand (NATIVE)	79.076	80.095	65.356	4.97	3.951	75.125	-0.003	Upward Gradient	41.14	4.11	0.35	*13*
MW34A-15	317225.218	4833998.431	21.2	17.38	21.2	Bedrock	79.017	80.123	57.817	5.12	4.014	75.003	0.016	Downward Gradient	1.87	0.19	0.02	*55*
MW35D-15*	317221.088	4833892.04	12.8	9.15	12.8	Sand (FILL)	80.0685	80.8435	67.2685	5.72	4.945	75.1235			57.37	5.74	0.35	
MW35C-15	317221.376	4833891.91	6.1	4.27	6.1	Silty Clay (FILL)	80.066	80.976	73.966	5.1	4.19	75.876	0.112	Downward Gradient	0.41	0.04	0.3	*6*
MW35B-15	317220.8	4833892.17	9.76	6.1	9.76	Peat/Silty Clay (NATIVE)	80.071	80.966	70.311	5.85	4.955	75.116	0.208	Downward Gradient	45.20	4.52	0.4	*858*
MW35A-15	316537.407	4833741.664	23.02	19.36	23.02	Bedrock	77.169	77.098	54.149	1.96	2.031	75.138	-0.001	Upward Gradient	0.98	0.10	0.02	*2*
MW36D-15	316492.448	4833472.647	3.05	1.22	3.05	Sand (FILL)/Sand (NATIVE)	76.469	76.397	73.419	1.21	1.282	75.187			57.36	5.74	0.35	
MW36C-15	316489.966	4833471.951	6.1	2.44	6.1	Sand (NATIVE)	76.451	76.362	70.351	1.19	1.279	75.172	0.005	Downward Gradient	41.14	4.11	0.35	*21*
MW36B-15	316488.191	4833471.462	10.67	7.01	10.67	Sand (NATIVE)	76.488	76.406	65.818	1.23	1.312	75.176	-0.001	Upward Gradient	41.14	4.11	0.35	*4*
MW36A-15	316491.211	4833472.285	21.54	17.68	21.54	Bedrock	76.428	76.323	54.888	1.26	1.365	75.063	0.010	Downward Gradient	1.87	0.19	0.02	*35*
MW37D-15	316665.112	4833585.726	3.05	1.52	3.05	Sand to Sandy Silt Fill/Sand (FILL)	76.446	76.382	73.396	1.22	1.284	75.162			57.37	5.74	0.35	
MW37C-15	316664.119	4833585.282	7.62	3.96	7.62	Sand (FILL)	76.453	76.373	68.833	1.22	1.3	75.153	0.002	Downward Gradient	41.14	4.11	0.35	*8*
MW37B-15	316663.224	4833584.836	10.67	7.01	10.67	Sand (FILL)	76.451	76.381	65.781	1.22	1.29	75.161	-0.003	Upward Gradient	41.14	4.11	0.35	*11*

Table 6-3. Vertical Hydraulic Gradients and Groundwater Flow Velocities

Waterfront Toronto - Port Lands

Well No.	Easting	Northing	Depth to bottom	Sandpack Interval		Lithology Screened	Ground Elevation	Top of Riser Pipe Elevation	Bottom of Well	Groundwater Elevations			Vertical Hydraulic Gradient	Vertical Hydraulic Gradient Direction	Horizontal Hydraulic Conductivity (K_h)	Vertical Hydraulic Conductivity (K_v)	Effective Porosity	Vertical Groundwater Flow Velocity
				Top	Bottom					*September 1, 2015*								
			(mbgs)	(mbgs)	(mbgs)		(mAMSL)	(mAMSL)	(mAMSL)	(mBTOR)	(mbgs)	(mAMSL)	(m/m)		(m/day)	(m/day)	(%)	(m/year)
MW37A-15**	316662.206	4833584.312	23.1	19.51	23.1	Bedrock	76.457	76.273	53.357	1.85	2.034	74.423	0.059	Downward Gradient	1.87	0.19	0.02	*203*
MW39D-15	317100.827	4834259.288	3.05	1.22	3.05	Sand/Silty Clay/Peat (NATIVE)	76.547	77.517	73.497	2.41	1.44	75.107			57.36	5.74	0.4	
MW39C-15	317101.505	4834258.016	7.62	3.96	7.62	Peat/Silty Clay (NATIVE)	76.544	77.584	68.924	2.45	1.41	75.134	-0.006	Upward Gradient	45.20	4.52	0.4	*24*
MW39B-15	317102.203	4834256.993	10.67	7.01	10.67	Silty Clay/Silty Sand/Gravelly Sand/Shale (NATIVE)	76.498	77.48	65.828	2.36	1.378	75.12	0.005	Downward Gradient	45.20	4.52	0.3	*25*
MW39A-15	317102.825	4834256.135	15.85	12.2	15.85	Bedrock	76.514	77.487	60.664	2.39	1.417	75.097	0.004	Downward Gradient	1.87	0.19	0.02	*15*
MW40D-15	317305.962	4834284.525	3.05	1.22	3.05	Gravel Fill/Clay (FILL)	76.929	77.805	73.879	2.39	1.514	75.415			0.41	0.04	0.3	
MW40C-15	317305.072	4834285.522	6.1	2.44	6.1	Silt/Sandy Silt/Silt/Sandy Silt (FILL)	76.904	77.66	70.804	2.43	1.674	75.23	0.060	Downward Gradient	0.54	0.05	0.3	*4*
MW40B-15	317304.412	4834286.52	10.57	7.01	10.57	Silty Sand/Sand (FILL)	76.89	77.719	66.32	2.57	1.741	75.149	0.018	Downward Gradient	15.28	1.53	0.35	*29*
MW40A-15	317303.743	4834287.941	16.24	12.59	16.24	Bedrock	76.812	77.693	60.572	2.54	1.659	75.153	-0.001	Upward Gradient	1.87	0.19	0.02	*2*

Notes:

[a.] Reference elevation taken from top of riser pipe.

* Elevations for MW35D-15 are approximate and require confirmation.

** Monitoring well casing damaged. Monitoring well to be repaired.

mASL metres Above Mean Sea Level. Elevations referenced with respect to benchmark.

mbgs metres below ground surface

mBTOR metres Below Top of Riser

Lake Ontario Water Level Elevation 75.017 mASL on September 1, 2015 at Station Number 13320.

Effective Porosity values referenced from Sara, Martin, N.2003. Site Assessment and Remediation Handbook (2nd ed.) CRC Press LLC, 501p

Table 6-4. Horizontal Groundwater Flow Velocities

Parameter	Symbol	Units	Fill / Native Sand	Fill / Native Sand	Fill / Native Sand	Fill / Native Sand	Fill / Native Sand	Fill / Native Sand	Bedrock
Hydraulic Gradient	i	m/m	0.002	0.005	0.001	0.004	0.001	0.0008	0.0005
Hydraulic Conductivity	K	m/d	31.02	31.02	31.02	31.02	31.02	31.02	0.71
Porosity	Φ	m/m	0.3	0.3	0.3	0.3	0.3	0.3	0.02
Groundwater Velocity	v	m/d	0.2068	0.5170	0.1034	0.4136	0.1034	0.0827	0.0178
Groundwater Velocity	v	m/yr	75	189	38	151	38	30	6

Table 9-1. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Greater Than 30 m from Lake Ontario/Don River) COC Screening - Table 3 Standards - RPI

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 (RPI) SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 3 (RPI) SCS	Count of Non-Detects Above Table 3 (RPI) SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
1,1,1,2-Tetrachloroethane	Volatile	170	405	0.058	10	180	180	32	48	**Included (Max > Table 3 [RPI] SCS)**
1,1,1-Trichloroethane	Volatile	171	406	0.38	38	180	180	20	17	**Included (Max > Table 3 [RPI] SCS)**
1,1,2,2-Tetrachloroethane	Volatile	171	406	0.05	10	180	180	32	60	**Included (Max > Table 3 [RPI] SCS)**
1,1,2-Trichloroethane	Volatile	162	390	0.05	10	370	370	32	52	**Included (Max > Table 3 [RPI] SCS)**
1,1'-Biphenyl	Non-Volatile	8	13	0.31		1	1		2	**Included (Max > Table 3 [RPI] SCS)**
1,1-Dichloroethane	Volatile	170	406	3.5	10	180	180	6	3	**Included (Max > Table 3 [RPI] SCS)**
1,1-Dichloroethene	Volatile	169	404	0.05	10	44	44	32	50	**Included (Max > Table 3 [RPI] SCS)**
1,2,4-Trichlorobenzene	Volatile	13	13	0.36		2	2		2	**Included (Max > Table 3 [RPI] SCS)**
1,2-Dibromoethane	Volatile	170	405	0.05	10	92	92	32	51	**Included (Max > Table 3 [RPI] SCS)**
1,2-Dichlorobenzene	Volatile	170	408	3.4	10	180	180	6	3	**Included (Max > Table 3 [RPI] SCS)**
1,2-Dichloroethane	Volatile	170	405	0.05	10	180	180	32	52	**Included (Max > Table 3 [RPI] SCS)**
1,2-Dichloropropane	Volatile	170	405	0.05	10	180	180	32	52	**Included (Max > Table 3 [RPI] SCS)**
1,3-Dichlorobenzene	Volatile	170	408	4.8	10	180	180	4	4	**Included (Max > Table 3 [RPI] SCS)**
1,3-Dichloropropene (max)	Volatile	170	405	0.05	10	92	92	32	37	**Included (Max > Table 3 [RPI] SCS)**
1,4-Dichlorobenzene	Volatile	170	408	0.083	10	180	180	32	44	**Included (Max > Table 3 [RPI] SCS)**
1+2-Methylnaphthalenes (max)	Volatile	139	394	0.99	5100	1	5100	72	2	**Included (Max > Table 3 [RPI] SCS)**
2,4&2,6-Dinitrotoluene (max)	Non-Volatile	8	9	0.92		1	1		2	**Included (Max > Table 3 [RPI] SCS)**
2-Butanone	Volatile	170	403	16	100	2800	2800	9	5	**Included (Max > Table 3 [RPI] SCS)**
3,3`-Dichlorobenzidine	Non-Volatile	8	9	1		9.99	9.99		8	**Included (Max > Table 3 [RPI] SCS)**
4-Chloroaniline	Non-Volatile	3	3	0.5		2	2		2	**Included (Max > Table 3 [RPI] SCS)**
4-Methyl-2-Pentanone	Volatile	165	399	1.7	100	1800	1800	25	21	**Included (Max > Table 3 [RPI] SCS)**
Acenaphthene	Non-Volatile	187	430	7.9	2100	6	2100	18		**Included (Max > Table 3 [RPI] SCS)**
Acenaphthylene	Non-Volatile	187	430	0.15	280	1.5	280	58	12	**Included (Max > Table 3 [RPI] SCS)**
Acetone	Volatile	170	404	16	500	2800	2800	20	9	**Included (Max > Table 3 [RPI] SCS)**
Ammonia	Volatile	2	2		157		157			**Included (No SCS; known to be present)**
Anthracene	Non-Volatile	187	430	0.67	970	1	970	53	1	**Included (Max > Table 3 [RPI] SCS)**
Antimony	Non-Volatile	176	426	7.5	33	1.6	33	3		**Included (Max > Table 3 [RPI] SCS)**
Arsenic	Non-Volatile	188	438	18	86	1	86	17		**Included (Max > Table 3 [RPI] SCS)**
Barium	Non-Volatile	193	443	390	930		930	3		**Included (Max > Table 3 [RPI] SCS)**
Benzene	Volatile	193	565	0.21	460	92	460	80	12	**Included (Max > Table 3 [RPI] SCS)**
Benzo(a)anthracene	Non-Volatile	187	426	0.5	460	1	460	88	1	**Included (Max > Table 3 [RPI] SCS)**
Benzo(a)pyrene	Non-Volatile	187	430	0.3	330	1	330	102	3	**Included (Max > Table 3 [RPI] SCS)**
Benzo(b&j)fluoranthene	Non-Volatile	187	430	0.78	260	1	260	59	1	**Included (Max > Table 3 [RPI] SCS)**
Benzo(g,h,i)perylene	Non-Volatile	186	429	6.6	130	1	130	12		**Included (Max > Table 3 [RPI] SCS)**
Benzo(k)fluoranthene	Non-Volatile	182	424	0.78	93	1	93	25	1	**Included (Max > Table 3 [RPI] SCS)**
Bis (2-chloroethyl) ether	Volatile	3	3	0.5		2	2		2	**Included (Max > Table 3 [RPI] SCS)**
bis (2-Chloroisopropyl) ether	Non-Volatile	6	7	0.67		1	1		2	**Included (Max > Table 3 [RPI] SCS)**
Boron (hot water extractable) [f]	Non-Volatile	126	361	1.5	7.38	0.1	7.38	37		**Included (Max > Table 3 [RPI] SCS)**
Bromide	Non-Volatile	5	5		4.99	3	4.99			**Included (No SCS; known to be present)**
Bromodichloromethane	Volatile	170	405	13	10	180	180		1	**Included (Max > Table 3 [RPI] SCS)**
Bromoform	Volatile	170	405	0.27	10	370	370	20	16	**Included (Max > Table 3 [RPI] SCS)**
Bromomethane	Volatile	170	405	0.05	20	370	370	32	54	**Included (Max > Table 3 [RPI] SCS)**
Cadmium	Non-Volatile	193	443	1.2	20	0.5	20	15		**Included (Max > Table 3 [RPI] SCS)**
Calcium	Non-Volatile	13	13	49000	144000		144000			**Included (Max > OTR value)**
Carbon tetrachloride	Volatile	170	405	0.05	10	180	180	32	52	**Included (Max > Table 3 [RPI] SCS)**
Chloride (Cl)	Non-Volatile	5	5	130	231	347	347			**Included (Max > OTR value)**
Chlorobenzene	Volatile	170	405	2.4	10	92	92	6	3	**Included (Max > Table 3 [RPI] SCS)**
Chlorodibromomethane	Volatile	170	405	9.4	10	180	180	1	2	**Included (Max > Table 3 [RPI] SCS)**
Chloroform	Volatile	170	405	0.05	10	180	180	32	64	**Included (Max > Table 3 [RPI] SCS)**
Chromium	Non-Volatile	193	504	160	714	1	714	1		**Included (Max > Table 3 [RPI] SCS)**
Chrysene	Non-Volatile	187	430	7	390	1	390	15		**Included (Max > Table 3 [RPI] SCS)**
cis-1,2-Dichloroethene	Volatile	167	400	3.4	10	180	180	6	3	**Included (Max > Table 3 [RPI] SCS)**
Cobalt	Non-Volatile	193	443	22	90.9	2	90.9	4		**Included (Max > Table 3 [RPI] SCS)**
Copper	Non-Volatile	193	443	140	1200		1200	10		**Included (Max > Table 3 [RPI] SCS)**
Cyanide	Non-Volatile	146	393	0.051	1	1	1	48	8	**Included (Max > Table 3 [RPI] SCS)**
Dibenzo(a,h)anthracene	Non-Volatile	187	430	0.1	35	1	35	57	21	**Included (Max > Table 3 [RPI] SCS)**
Dichloromethane	Volatile	170	404	0.1	460	180	460	33	30	**Included (Max > Table 3 [RPI] SCS)**
Diethylphthalate	Non-Volatile	8	9	0.5		2	2		2	**Included (Max > Table 3 [RPI] SCS)**
Dimethylphthalate	Non-Volatile	8	9	0.5		2	2		2	**Included (Max > Table 3 [RPI] SCS)**
Electrical Conductivity [e, f]	Non-Volatile	154	401	0.7	5.85		5.85	72		**Included (Max > Table 3 [RPI] SCS)**

Tale 9-1. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Greater Than 30 m from Lake Ontario/Don River)
COC Screening - Table 3 Standards - RPI
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 (RPI) SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 3 (RPI) SCS	Count of Non-Detects Above Table 3 (RPI) SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Ethylbenzene	Volatile	193	566	2	2700	20	2700	68	2	**Included (Max > Table 3 [RPI] SCS)**
F1 (C6-C10) (max)	Volatile	184	491	55	8840	400	8840	83	1	**Included (Max > Table 3 [RPI] SCS)**
F2 (C10-C16) (max)	Volatile	184	468	98	51000	50	51000	104		**Included (Max > Table 3 [RPI] SCS)**
F3 (C16-C34) (max)	Non-Volatile	184	469	300	48000	150	48000	113		**Included (Max > Table 3 [RPI] SCS)**
F4 (C34-C50) (max)	Non-Volatile	184	466	2800	44000	150	44000	20		**Included (Max > Table 3 [RPI] SCS)**
Fluoranthene	Non-Volatile	187	428	0.69	1000	1	1000	108	1	**Included (Max > Table 3 [RPI] SCS)**
Fluorene	Non-Volatile	187	428	62	1100	1	1100	7		**Included (Max > Table 3 [RPI] SCS)**
Hexachlorobenzene	Non-Volatile	8	9	0.52		2	2		2	**Included (Max > Table 3 [RPI] SCS)**
Hexachlorobutadiene	Volatile	3	3	0.012		1	1		3	**Included (Max > Table 3 [RPI] SCS)**
Hexachloroethane	Volatile	3	3	0.089		1	1		3	**Included (Max > Table 3 [RPI] SCS)**
Indeno(1,2,3-Cd)Pyrene	Non-Volatile	187	430	0.38	110	1	110	67	4	**Included (Max > Table 3 [RPI] SCS)**
Lead	Non-Volatile	193	443	120	3700		3700	52		**Included (Max > Table 3 [RPI] SCS)**
Magnesium	Non-Volatile	13	13	15000	71599.99		71599.99			**Included (Max > OTR value)**
Mercury	Non-Volatile	186	437	0.27	9.1	0.05	9.1	41		**Included (Max > Table 3 [RPI] SCS)**
Methyl tert-butyl ether (MTBE)	Volatile	170	405	0.75	10	370	370	13	16	**Included (Max > Table 3 [RPI] SCS)**
Molybdenum	Non-Volatile	192	443	6.9	8.2	3	8.2	3		**Included (Max > Table 3 [RPI] SCS)**
Naphthalene	Volatile	175	412	0.6	8700	5	8700	68	2	**Included (Max > Table 3 [RPI] SCS)**
n-Hexane	Volatile	85	274	2.8	17.6	2	17.6	3		**Included (Max > Table 3 [RPI] SCS)**
Nickel	Non-Volatile	193	443	100	239.99	2	239.99	2		**Included (Max > Table 3 [RPI] SCS)**
PCB, Total	Non-Volatile	36	48	0.35	0.6	0.3	0.6	2		**Included (Max > Table 3 [RPI] SCS)**
Pentachlorophenol	Non-Volatile	3	3	0.1		2	2		3	**Included (Max > Table 3 [RPI] SCS)**
Perchlorate	Non-Volatile	4	4		0.82		0.82			**Included (No SCS; known to be present)**
Phenanthrene	Non-Volatile	187	430	6.2	3100	1	3100	36		**Included (Max > Table 3 [RPI] SCS)**
Pyrene	Non-Volatile	187	429	78	1400	1	1400	8		**Included (Max > Table 3 [RPI] SCS)**
Selenium	Non-Volatile	188	438	2.4	12	1	12	5		**Included (Max > Table 3 [RPI] SCS)**
Sodium Adsorption Ratio [e, f]	Non-Volatile	157	391	5	703940		703940	45		**Included (Max > Table 3 [RPI] SCS)**
Strontium	Non-Volatile	13	13	77	109		109			**Included (Max > OTR value)**
Styrene	Volatile	170	405	0.7	10	180	180	13	8	**Included (Max > Table 3 [RPI] SCS)**
Tetrachloroethene	Volatile	171	406	0.28	10	180	180	20	17	**Included (Max > Table 3 [RPI] SCS)**
Thallium	Non-Volatile	184	434	1	1	2	2		12	**Included (Max > Table 3 [RPI] SCS)**
Toluene	Volatile	194	567	2.3	1900	0.39	1900	28		**Included (Max > Table 3 [RPI] SCS)**
trans-1,2-Dichloroethene	Volatile	170	405	0.084	10	180	180	33	42	**Included (Max > Table 3 [RPI] SCS)**
Trichloroethylene	Volatile	171	422	0.061	10	180	180	34	34	**Included (Max > Table 3 [RPI] SCS)**
Trichlorofluoromethane	Volatile	104	300	4		18.99	18.99		1	**Included (Max > Table 3 [RPI] SCS)**
Vanadium	Non-Volatile	193	443	86	89.3	5	89.3	2		**Included (Max > Table 3 [RPI] SCS)**
Vinyl Chloride	Volatile	171	405	0.02	10	55	55	38	50	**Included (Max > Table 3 [RPI] SCS)**
Xylenes, Total (max)	Volatile	194	567	3.1	11000	1.8	11000	61		**Included (Max > Table 3 [RPI] SCS)**
Zinc	Non-Volatile	193	443	340	1800		1800	19		**Included (Max > Table 3 [RPI] SCS)**
2-Chloroethyl Vinyl Ether	Volatile	9	15			97	97			**Included (No SCS, not detected, with elevated SDL)**
Chloroethane	Volatile	18	24			18.99	18.99			**Included (No SCS, not detected, with elevated SDL)**
Chloromethane	Volatile	18	24			18.99	18.99			**Included (No SCS, not detected, with elevated SDL)**
Nitrite (as N)	Non-Volatile	7	7	44	1	1	1			Excluded (Max < or = OTR Value)
Sulfate	Non-Volatile	5	5	1100	132		132			Excluded (Max < or = OTR Value)
Zirconium	Non-Volatile	12	12	230	8.99		8.99			Excluded (Max < or = Natural Range)
2,4,5-Trichlorophenol	Non-Volatile	3	3	4.4		1	1			Excluded (Max < or = Table 3 [RPI] SCS)
2,4,6-Trichlorophenol	Non-Volatile	3	3	3.8		1	1			Excluded (Max < or = Table 3 [RPI] SCS)
2,4-Dichlorophenol	Non-Volatile	3	3	1.7		1	1			Excluded (Max < or = Table 3 [RPI] SCS)
2,4-Dimethylphenol	Non-Volatile	3	3	390		1	1			Excluded (Max < or = Table 3 [RPI] SCS)
2,4-Dinitrophenol	Non-Volatile	3	3	38		2	2			Excluded (Max < or = Table 3 [RPI] SCS)
2-Chloronaphthalene	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
2-Chlorophenol	Volatile	3	3	1.6		1	1			Excluded (Max < or = Table 3 [RPI] SCS)
2-Hexanone	Volatile	9	9			0.47	0.47			Excluded (No SCS, not detected, no elevated SDL)
4-Bromophenyl Phenyl Ether	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
4-Chlorophenyl Phenylether	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Aluminum	Non-Volatile	13	13	26000	11100		11100			Excluded (Max < or = OTR Value)
Beryllium	Non-Volatile	193	443	4	2	0.5	2			Excluded (Max < or = Table 3 [RPI] SCS)
Bis (2-chloroethoxy) methane	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Bis (2-ethylhexyl) phthalate	Non-Volatile	8	9	5		4.99	4.99			Excluded (Max < or = Table 3 [RPI] SCS)
Boron	Non-Volatile	122	335	120	53.9	5	53.9			Excluded (Max < or = Table 3 [RPI] SCS)
Butyl benzyl phthalate	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)

Tale 9-1. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Greater Than 30 m from Lake Ontario/Don River)
COC Screening - Table 3 Standards - RPI
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 (RPI) SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 3 (RPI) SCS	Count of Non-Detects Above Table 3 (RPI) SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Chromium, Hexavalent (Cr6+)	Non-Volatile	127	363	8	2	1	2			Excluded (Max < or = Table 3 [RPI] SCS)
Dichlorodifluoromethane	Volatile	85	275	16		2	2			Excluded (Max < or = Table 3 [RPI] SCS)
Di-N-Butylphthalate	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Di-n-octyl phthalate	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
Fluoride	Non-Volatile	5	5	110	4.99	4.99	4.99			Excluded (Max < or = OTR Value)
Iron	Non-Volatile	13	13	34000	17299.99		17299.99			Excluded (Max < or = OTR Value)
Isophorone	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Manganese	Non-Volatile	13	13	1400	333		333			Excluded (Max < or = OTR Value)
Nitrate (as N)	Non-Volatile	7	7	44		2	2			Excluded (Max < or = OTR Value)
N-Nitrosodi-N-propylamine	Non-Volatile	5	6			1	1			Excluded (No SCS, not detected, no elevated SDL)
N-Nitrosodiphenylamine	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
ortho-Phosphate	Non-Volatile	5	5	1500		4.99	4.99			Excluded (Max < or = OTR Value)
Phenol	Non-Volatile	3	3	9.4		2	2			Excluded (Max < or = Table 3 [RPI] SCS)
Phosphorus	Non-Volatile	15	15	1500	980	20	980			Excluded (Max < or = OTR Value)
Potassium	Non-Volatile	15	15	4900	2000		2000			Excluded (Max < or = OTR Value)
Silver	Non-Volatile	193	443	20	10.3	0.69	10.3			Excluded (Max < or = Table 3 [RPI] SCS)
Sodium	Non-Volatile	13	13	1000	370		370			Excluded (Max < or = OTR Value)
Titanium	Non-Volatile	12	12	4700	449.99		449.99			Excluded (Max < or = OTR Value)
Total Kjeldahl Nitrogen	Non-Volatile	2	2	7000	1630		1630			Excluded (Max < or = OTR Value)
Uranium (U)	Non-Volatile	85	273	23	1.9	1	1.9			Excluded (Max < or = Table 3 [RPI] SCS)

Notes:

[a] (max) indicates the representative maximum concentration (the maximum concentration of similar analytes or total concentration of multiple isomers) is used for comparison.

[b] Indicates whether the parameter is considered volatile or non-volatile under MOECC-specified criteria.

[c] Ontario Regulation 153/04, *Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition* (RPI land use) (MOECC, 2011), for all COCs, except for aluminum, calcium, chloride, fluoride, iron, manganese, magnesium, phosphorus, potassium, sodium, strontium, titanium and total Kjeldahl nitrogen, for which the *Ontario Typical Range* value (MOECC, 2011) is presented. The average soil concentration of zirconium in soil as reported by the United States Geological Survey in Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States (1984) has been presented for zirconium. The OTR value (MOECC, 1999) for nitrate+nitrate has been applied to nitrate and nitrite. The OTR (MOECC, 2011) value for phosphorus and sulphur has been applied to ortho-Phosphate and sulphate, respectively.

[d] Column lists the greater of the Maximum Detected Concentration and the Maximum Non-Detect Concentration.

[e] Units for electrical conductivity are mS/cm and units for sodium adsorption ratio are SAR.

[f] Parameter is not applicable to human health.

Bold parameters are identified as COCs

COC - contaminant of concern

m - metres

Max - maximum concentration

mg/kg - milligrams per kilogram

MOECC - Ontario Ministry of the Environment and Climate Change

mS/cm - milliSiemens per centimetre

NA - not applicable

PCB - polychlorinated biphenyls

SAR - sodium adsorption ratio

SCS - site condition standard

SDL - sample detection limit

RPI - residential/parkland/institutional

Table 9-2. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Greater Than 30 m From Lake Ontario/Don River)
COC Screening - Table 3 Standards - ICC
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 (ICC) SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 3 (ICC) SCS	Count of Non-Detects Above Table 3 (ICC) SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
1,1,1,2-Tetrachloroethane	Volatile	170	405	0.087	10	180	180	32	38	**Included (Max > Table 3 [ICC] SCS)**
1,1,1-Trichloroethane	Volatile	171	406	6.1	38	180	180	2	3	**Included (Max > Table 3 [ICC] SCS)**
1,1,2,2-Tetrachloroethane	Volatile	171	406	0.05	10	180	180	32	60	**Included (Max > Table 3 [ICC] SCS)**
1,1,2-Trichloroethane	Volatile	162	390	0.05	10	370	370	32	52	**Included (Max > Table 3 [ICC] SCS)**
1,1-Dichloroethane	Volatile	170	406	17	10	180	180		1	**Included (Max > Table 3 [ICC] SCS)**
1,1-Dichloroethene	Volatile	169	404	0.064	10	44	44	32	50	**Included (Max > Table 3 [ICC] SCS)**
1,2-Dibromoethane	Volatile	170	405	0.05	10	92	92	32	51	**Included (Max > Table 3 [ICC] SCS)**
1,2-Dichlorobenzene	Volatile	170	408	6.8	10	180	180	1	3	**Included (Max > Table 3 [ICC] SCS)**
1,2-Dichloroethane	Volatile	170	405	0.05	10	180	180	32	52	**Included (Max > Table 3 [ICC] SCS)**
1,2-Dichloropropane	Volatile	170	405	0.16	10	180	180	25	24	**Included (Max > Table 3 [ICC] SCS)**
1,3-Dichlorobenzene	Volatile	170	408	9.6	10	180	180	1	3	**Included (Max > Table 3 [ICC] SCS)**
1,3-Dichloropropene (max)	Volatile	170	405	0.18	10	92	92	25	19	**Included (Max > Table 3 [ICC] SCS)**
1,4-Dichlorobenzene	Volatile	170	408	0.2	10	180	180	20	20	**Included (Max > Table 3 [ICC] SCS)**
1+2-Methylnaphthalenes (max)	Volatile	139	394	76	5100	1	5100	13		**Included (Max > Table 3 [ICC] SCS)**
2-Butanone	Volatile	170	403	70	100	2800	2800	1	3	**Included (Max > Table 3 [ICC] SCS)**
3,3`-Dichlorobenzidine	Non-Volatile	8	9	1		9.99	9.99		8	**Included (Max > Table 3 [ICC] SCS)**
4-Chloroaniline	Non-Volatile	3	3	0.5		2	2		2	**Included (Max > Table 3 [ICC] SCS)**
4-Methyl-2-Pentanone	Volatile	165	399	31	100	1800	1800	6	3	**Included (Max > Table 3 [ICC] SCS)**
Acenaphthene	Non-Volatile	187	430	96	2100	6	2100	7		**Included (Max > Table 3 [ICC] SCS)**
Acenaphthylene	Non-Volatile	187	430	0.15	280	1.5	280	58	12	**Included (Max > Table 3 [ICC] SCS)**
Acetone	Volatile	170	404	16	500	2800	2800	20	9	**Included (Max > Table 3 [ICC] SCS)**
Ammonia	Volatile	2	2		157		157			**Included (No SCS; known to be present)**
Anthracene	Non-Volatile	187	430	0.67	970	1	970	53	1	**Included (Max > Table 3 [ICC] SCS)**
Arsenic	Non-Volatile	188	438	18	86	1	86	17		**Included (Max > Table 3 [ICC] SCS)**
Barium	Non-Volatile	193	443	670	930		930	2		**Included (Max > Table 3 [ICC] SCS)**
Benzene	Volatile	193	565	0.32	460	92	460	68	7	**Included (Max > Table 3 [ICC] SCS)**
Benzo(a)anthracene	Non-Volatile	187	426	0.96	460	1	460	61	1	**Included (Max > Table 3 [ICC] SCS)**
Benzo(a)pyrene	Non-Volatile	187	430	0.3	330	1	330	102	3	**Included (Max > Table 3 [ICC] SCS)**
Benzo(b&j)fluoranthene	Non-Volatile	187	430	0.96	260	1	260	51	1	**Included (Max > Table 3 [ICC] SCS)**
Benzo(g,h,i)perylene	Non-Volatile	186	429	9.6	130	1	130	7		**Included (Max > Table 3 [ICC] SCS)**
Benzo(k)fluoranthene	Non-Volatile	182	424	0.96	93	1	93	21	1	**Included (Max > Table 3 [ICC] SCS)**
Bis (2-chloroethyl) ether	Volatile	3	3	0.5		2	2		2	**Included (Max > Table 3 [ICC] SCS)**
Boron (hot water extractable) [f]	Non-Volatile	126	361	2	7.38	0.1	7.38	21		**Included (Max > Table 3 [ICC] SCS)**
Bromide	Non-Volatile	5	5		4.99	3	4.99			**Included (No SCS; known to be present)**
Bromodichloromethane	Volatile	170	405	18	10	180	180		1	**Included (Max > Table 3 [ICC] SCS)**
Bromoform	Volatile	170	405	0.61	10	370	370	13	12	**Included (Max > Table 3 [ICC] SCS)**
Bromomethane	Volatile	170	405	0.05	20	370	370	32	54	**Included (Max > Table 3 [ICC] SCS)**
Cadmium	Non-Volatile	193	443	1.9	20	0.5	20	7		**Included (Max > Table 3 [ICC] SCS)**
Calcium	Non-Volatile	13	13	49000	144000		144000			**Included (Max > OTR value)**
Carbon tetrachloride	Volatile	170	405	0.21	10	180	180	20	19	**Included (Max > Table 3 [ICC] SCS)**
Chloride (Cl)	Non-Volatile	5	5	130	231	347	347			**Included (Max > OTR value)**
Chlorobenzene	Volatile	170	405	2.4	10	92	92	6	3	**Included (Max > Table 3 [ICC] SCS)**
Chlorodibromomethane	Volatile	170	405	13	10	180	180		1	**Included (Max > Table 3 [ICC] SCS)**
Chloroform	Volatile	170	405	0.47	10	180	180	15	15	**Included (Max > Table 3 [ICC] SCS)**
Chromium	Non-Volatile	193	504	160	714	1	714	1		**Included (Max > Table 3 [ICC] SCS)**
Chrysene	Non-Volatile	187	430	9.6	390	1	390	12		**Included (Max > Table 3 [ICC] SCS)**
cis-1,2-Dichloroethene	Volatile	167	400	55	10	180	180		1	**Included (Max > Table 3 [ICC] SCS)**
Cobalt	Non-Volatile	193	443	80	90.9	2	90.9	1		**Included (Max > Table 3 [ICC] SCS)**
Copper	Non-Volatile	193	443	230	1200		1200	5		**Included (Max > Table 3 [ICC] SCS)**
Cyanide	Non-Volatile	146	393	0.051	1	1	1	48	8	**Included (Max > Table 3 [ICC] SCS)**
Dibenzo(a,h)anthracene	Non-Volatile	187	430	0.1	35	1	35	57	21	**Included (Max > Table 3 [ICC] SCS)**
Dichloromethane	Volatile	170	404	1.6	460	180	460	14	4	**Included (Max > Table 3 [ICC] SCS)**
Diethylphthalate	Non-Volatile	8	9	0.5		2	2		2	**Included (Max > Table 3 [ICC] SCS)**
Dimethylphthalate	Non-Volatile	8	9	0.5		2	2		2	**Included (Max > Table 3 [ICC] SCS)**
Electrical Conductivity [e, f]	Non-Volatile	154	401	1.4	5.85		5.85	32		**Included (Max > Table 3 [ICC] SCS)**
Ethylbenzene	Volatile	193	566	9.5	2700	20	2700	41	1	**Included (Max > Table 3 [ICC] SCS)**
F1 (C6-C10) (max)	Volatile	184	491	55	8840	400	8840	83	1	**Included (Max > Table 3 [ICC] SCS)**
F2 (C10-C16) (max)	Volatile	184	468	230	51000	50	51000	77		**Included (Max > Table 3 [ICC] SCS)**
F3 (C16-C34) (max)	Non-Volatile	184	469	1700	48000	150	48000	41		**Included (Max > Table 3 [ICC] SCS)**
F4 (C34-C50) (max)	Non-Volatile	184	466	3300	44000	150	44000	20		**Included (Max > Table 3 [ICC] SCS)**

Table 9-2. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Greater Than 30 m From Lake Ontario/Don River)
COC Screening - Table 3 Standards - ICC
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 (ICC) SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 3 (ICC) SCS	Count of Non-Detects Above Table 3 (ICC) SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Fluoranthene	Non-Volatile	187	428	9.6	1000	1	1000	19		**Included (Max > Table 3 [ICC] SCS)**
Fluorene	Non-Volatile	187	428	62	1100	1	1100	7		**Included (Max > Table 3 [ICC] SCS)**
Hexachlorobenzene	Non-Volatile	8	9	0.66		2	2		2	**Included (Max > Table 3 [ICC] SCS)**
Hexachlorobutadiene	Volatile	3	3	0.031		1	1		3	**Included (Max > Table 3 [ICC] SCS)**
Hexachloroethane	Volatile	3	3	0.21		1	1		2	**Included (Max > Table 3 [ICC] SCS)**
Indeno(1,2,3-Cd)Pyrene	Non-Volatile	187	430	0.76	110	1	110	38	1	**Included (Max > Table 3 [ICC] SCS)**
Lead	Non-Volatile	193	443	120	3700		3700	52		**Included (Max > Table 3 [ICC] SCS)**
Magnesium	Non-Volatile	13	13	15000	71599.99		71599.99			**Included (Max > OTR value)**
Mercury	Non-Volatile	186	437	3.9	9.1	0.05	9.1	5		**Included (Max > Table 3 [ICC] SCS)**
Methyl tert-butyl ether (MTBE)	Volatile	170	405	11	10	370	370		3	**Included (Max > Table 3 [ICC] SCS)**
Naphthalene	Volatile	175	412	9.6	8700	5	8700	29		**Included (Max > Table 3 [ICC] SCS)**
Perchlorate	Non-Volatile	4	4		0.82		0.82			**Included (No SCS; known to be present)**
Phenanthrene	Non-Volatile	187	430	12	3100	1	3100	24		**Included (Max > Table 3 [ICC] SCS)**
Pyrene	Non-Volatile	187	429	96	1400	1	1400	6		**Included (Max > Table 3 [ICC] SCS)**
Selenium	Non-Volatile	188	438	5.5	12	1	12	2		**Included (Max > Table 3 [ICC] SCS)**
Sodium Absorption Ratio [e, f]	Non-Volatile	157	391	12	703940		703940	32		**Included (Max > Table 3 [ICC] SCS)**
Strontium	Non-Volatile	13	13	77	109		109			**Included (Max > OTR value)**
Styrene	Volatile	170	405	34	10	180	180		2	**Included (Max > Table 3 [ICC] SCS)**
Tetrachloroethene	Volatile	171	406	4.5	10	180	180	4	3	**Included (Max > Table 3 [ICC] SCS)**
Toluene	Volatile	194	567	68	1900	0.39	1900	13		**Included (Max > Table 3 [ICC] SCS)**
trans-1,2-Dichloroethene	Volatile	170	405	1.3	10	180	180	9	5	**Included (Max > Table 3 [ICC] SCS)**
Trichloroethylene	Volatile	171	422	0.91	10	180	180	14	5	**Included (Max > Table 3 [ICC] SCS)**
Trichlorofluoromethane	Volatile	104	300	4		18.99	18.99		1	**Included (Max > Table 3 [ICC] SCS)**
Vanadium	Non-Volatile	193	443	86	89.3	5	89.3	2		**Included (Max > Table 3 [ICC] SCS)**
Vinyl Chloride	Volatile	171	405	0.032	10	55	55	37	36	**Included (Max > Table 3 [ICC] SCS)**
Xylenes, Total	Volatile	194	567	26	11000	1.8	11000	31		**Included (Max > Table 3 [ICC] SCS)**
Zinc	Non-Volatile	193	443	340	1800		1800	19		**Included (Max > Table 3 [ICC] SCS)**
2-Chloroethyl Vinyl Ether	Volatile	9	15			97	97			**Included (No SCS, not detected, with elevated SDL)**
Chloroethane	Volatile	18	24			18.99	18.99			**Included (No SCS, not detected, with elevated SDL)**
Chloromethane	Volatile	18	24			18.99	18.99			**Included (No SCS, not detected, with elevated SDL)**
Nitrite (as N)	Non-Volatile	7	7	44	1	1	1			Excluded (Max < or = OTR Value)
Sulfate	Non-Volatile	5	5	1100	132		132			Excluded (Max < or = OTR Value)
Total Kjeldahl Nitrogen	Non-Volatile	2	2	7000	1630		1630			Excluded (Max < or = OTR Value)
Zirconium	Non-Volatile	12	12	230	8.99		8.99			Excluded (Max < or = Natural Range)
1,1'-Biphenyl	Non-Volatile	8	13	52		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
1,2,4-Trichlorobenzene	Volatile	13	13	3.2		2	2			Excluded (Max < or = Table 3 [ICC] SCS)
2,4,5-Trichlorophenol	Non-Volatile	3	3	10		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
2,4,6-Trichlorophenol	Non-Volatile	3	3	3.8		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
2,4-Dichlorophenol	Non-Volatile	3	3	3.4		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
2,4-Dimethylphenol	Non-Volatile	3	3	390		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
2,4-Dinitrophenol	Non-Volatile	3	3	59		2	2			Excluded (Max < or = Table 3 [ICC] SCS)
2,4&2,6-Dinitrotoluene (max)	Non-Volatile	8	9	1.2		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
2-Chloronaphthalene	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
2-Chlorophenol	Volatile	3	3	3.1		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
2-Hexanone	Volatile	9	9			0.47	0.47			Excluded (No SCS, not detected, no elevated SDL)
4-Bromophenyl Phenyl Ether	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
4-Chlorophenyl Phenylether	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Aluminum	Non-Volatile	13	13	26000	11100		11100			Excluded (Max < or = OTR Value)
Antimony	Non-Volatile	176	426	40	33	1.6	33			Excluded (Max < or = Table 3 [ICC] SCS)
Beryllium	Non-Volatile	193	443	8	2	0.5	2			Excluded (Max < or = Table 3 [ICC] SCS)
Bis (2-chloroethoxy) methane	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
bis (2-Chloroisopropyl) ether	Non-Volatile	6	7	11		1	1			Excluded (Max < or = Table 3 [ICC] SCS)
Bis (2-ethylhexyl) phthalate	Non-Volatile	8	9	28		4.99	4.99			Excluded (Max < or = Table 3 [ICC] SCS)
Boron	Non-Volatile	122	335	120	53.9	5	53.9			Excluded (Max < or = Table 3 [ICC] SCS)
Butyl benzyl phthalate	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
Chromium, Hexavalent (Cr6+)	Non-Volatile	127	363	8	2	1	2			Excluded (Max < or = Table 3 [ICC] SCS)
Dichlorodifluoromethane	Volatile	85	275	16		2	2			Excluded (Max < or = Table 3 [ICC] SCS)
Di-N-Butylphthalate	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Di-n-octyl phthalate	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
Fluoride	Non-Volatile	5	5	110	4.99	4.99	4.99			Excluded (Max < or = OTR Value)

Table 9-2. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Greater Than 30 m From Lake Ontario/Don River)
COC Screening - Table 3 Standards - ICC
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 (ICC) SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 3 (ICC) SCS	Count of Non-Detects Above Table 3 (ICC) SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Iron	Non-Volatile	13	13	34000	17299.99		17299.99			Excluded (Max < or = OTR Value)
Isophorone	Non-Volatile	5	6			0.19	0.19			Excluded (No SCS, not detected, no elevated SDL)
Manganese	Non-Volatile	13	13	1400	333		333			Excluded (Max < or = OTR Value)
Molybdenum	Non-Volatile	192	443	40	8.2	3	8.2			Excluded (Max < or = Table 3 [ICC] SCS)
n-Hexane	Volatile	85	274	46	17.6	2	17.6			Excluded (Max < or = Table 3 [ICC] SCS)
Nickel	Non-Volatile	193	443	270	239.99	2	239.99			Excluded (Max < or = Table 3 [ICC] SCS)
Nitrate (as N)	Non-Volatile	7	7	44		2	2			Excluded (Max < or = OTR Value)
N-Nitrosodi-N-propylamine	Non-Volatile	5	6			1	1			Excluded (No SCS, not detected, no elevated SDL)
N-Nitrosodiphenylamine	Non-Volatile	5	6			0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
ortho-Phosphate	Non-Volatile	5	5	1500		4.99	4.99			Excluded (Max < or = OTR Value)
PCB, Total	Non-Volatile	36	48	1.1	0.6	0.3	0.6			Excluded (Max < or = Table 3 [ICC] SCS)
Pentachlorophenol	Non-Volatile	3	3	2.9		2	2			Excluded (Max < or = Table 3 [ICC] SCS)
Phenol	Non-Volatile	3	3	9.4		2	2			Excluded (Max < or = Table 3 [ICC] SCS)
Phosphorus	Non-Volatile	15	15	1500	980	20	980			Excluded (Max < or = OTR Value)
Potassium	Non-Volatile	15	15	4900	2000		2000			Excluded (Max < or = OTR Value)
Silver	Non-Volatile	193	443	40	10.3	0.69	10.3			Excluded (Max < or = Table 3 [ICC] SCS)
Sodium	Non-Volatile	13	13	1000	370		370			Excluded (Max < or = OTR Value)
Thallium	Non-Volatile	184	434	3.3	1	2	2			Excluded (Max < or = Table 3 [ICC] SCS)
Titanium	Non-Volatile	12	12	4700	449.99		449.99			Excluded (Max < or = OTR Value)
Uranium (U)	Non-Volatile	85	273	33	1.9	1	1.9			Excluded (Max < or = Table 3 [ICC] SCS)

Notes:

[a] (max) indicates the representative maximum concentration (the maximum concentration of similar analytes or total concentration of multiple isomers) is used for comparison.

[b] Indicates whether the parameter is considered volatile or non-volatile under MOECC-specified criteria.

[c] Ontario Regulation 153/04, *Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition* (ICC land use) (MOECC, 2011), for all COCs, except for aluminum, calcium, chloride, fluouride, iron, manganese, magnesium, phosphorus, potassium, sodium, strontium, titanium and total Kjeldahl nitrogen, for which the *Ontario Typical Range* value (MOECC, 2011) is presented. The average soil concentration of zirconium in soil as reported by the United States Geological Survey in *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States* (1984) has been presented for zirconium. The OTR value (MOECC, 1999) for nitrate+nitrate has been applied to nitrate and nitrite. The OTR (MOECC, 2011) value for phosphorus and sulphur has been applied to ortho-Phosphate and sulphate, respectively.

[d] Column lists the greater of the Maximum Detected Concentration and the Maximum Non-Detect Concentration.

[e] Units for electrical conductivity are mS/cm and units for sodium adsorption ratio are SAR.

[f] Parameter is not applicable to human health.

Bold parameters are identified as COCs

COC - contaminant of concern

ICC - industrial/commercial/community

m - metres

Max - maximum concentration

mg/kg - milligrams per kilogram

MOECC - Ontario Ministry of the Environment and Climate Change

mS/cm - milliSiemens per centimetre

PAH - polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyls

SAR - sodium adsorption ratio

SCS - site condition standard

SDL - sample detection limit

Table 9-3. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Less Than 30 m From Lake Ontario/Don River)
COC Screening - Table 9 Standards
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 9 SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 9 SCS	Count of Non-Detects Above Table 9 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
1,1,1,2-Tetrachloroethane	Volatile	18	41	0.05	2	0.05	2	4		**Included (Max > Table 9 SCS)**
1,1,1-Trichloroethane	Volatile	18	41	0.05	8.39	1.4	8.39	4	1	**Included (Max > Table 9 SCS)**
1,1,2,2-Tetrachloroethane	Volatile	18	41	0.05	9.39	0.05	9.39	5		**Included (Max > Table 9 SCS)**
1,1,2-Trichloroethane	Volatile	18	41	0.05	2	0.19	2	3	1	**Included (Max > Table 9 SCS)**
1,1-Dichloroethane	Volatile	18	41	0.05	3.68	0.05	3.68	5		**Included (Max > Table 9 SCS)**
1,1-Dichloroethene	Volatile	18	41	0.05	2	0.05	2	3		**Included (Max > Table 9 SCS)**
1,2-Dibromoethane	Volatile	18	41	0.05	17600	0.05	17600	4		**Included (Max > Table 9 SCS)**
1,2-Dichlorobenzene	Volatile	18	41	0.05	2	0.05	2	4		**Included (Max > Table 9 SCS)**
1,2-Dichloroethane	Volatile	18	41	0.05	2	0.05	2	5		**Included (Max > Table 9 SCS)**
1,2-Dichloropropane	Volatile	18	41	0.05	2	0.25	2	3	2	**Included (Max > Table 9 SCS)**
1,3-Dichlorobenzene	Volatile	18	41	0.05	2	0.19	2	3	1	**Included (Max > Table 9 SCS)**
1,3-Dichloropropene (max)	Volatile	17	39	0.05	2	0.19	2	3	1	**Included (Max > Table 9 SCS)**
1,4-Dichlorobenzene	Volatile	18	41	0.05	2	0.05	2	3		**Included (Max > Table 9 SCS)**
1+2-Methylnaphthalenes (max)	Volatile	25	29	0.59	57	0.04	57	5		**Included (Max > Table 9 SCS)**
2-Butanone	Volatile	18	41	0.5	8550	0.5	8550	4		**Included (Max > Table 9 SCS)**
2-Hexanone	Volatile	1	2			0.04	0.04			**Included (No SCS, not detected, with elevated SDL)**
4-Methyl-2-Pentanone	Volatile	18	41	0.5	12600	0.5	12600	4		**Included (Max > Table 9 SCS)**
Acenaphthene	Non-Volatile	25	59	0.072	46.99	0.25	46.99	21	2	**Included (Max > Table 9 SCS)**
Acenaphthylene	Non-Volatile	25	59	0.093	8.99	0.1	8.99	9	1	**Included (Max > Table 9 SCS)**
Acetone	Volatile	18	41	0.5	100	1	100	3	1	**Included (Max > Table 9 SCS)**
Anthracene	Non-Volatile	25	59	0.22	24.4	0.05	24.4	14		**Included (Max > Table 9 SCS)**
Antimony	Non-Volatile	26	75	1.3	669	1	669	13		**Included (Max > Table 9 SCS)**
Arsenic	Non-Volatile	26	75	18	220	1	220	5		**Included (Max > Table 9 SCS)**
Barium	Non-Volatile	26	75	220	330		330	3		**Included (Max > Table 9 SCS)**
Benzene	Volatile	25	75	0.02	35900	4.99	35900	13	3	**Included (Max > Table 9 SCS)**
Benzo(a)anthracene	Non-Volatile	25	59	0.36	113	0.05	113	10		**Included (Max > Table 9 SCS)**
Benzo(a)pyrene	Non-Volatile	25	59	0.3	86.9	0.05	86.9	10		**Included (Max > Table 9 SCS)**
Benzo(b&j)fluoranthene	Non-Volatile	25	59	0.47	105	0.05	105	8		**Included (Max > Table 9 SCS)**
Benzo(g,h,i)perylene	Non-Volatile	25	59	0.68	33.7	0.05	33.7	3		**Included (Max > Table 9 SCS)**
Benzo(k)fluoranthene	Non-Volatile	25	59	0.48	37.8	9.99	37.8	3	1	**Included (Max > Table 9 SCS)**
Beryllium	Non-Volatile	26	75	2.5	50	9.99	50	1	1	**Included (Max > Table 9 SCS)**
Boron (hot water extractable) [f]	Non-Volatile	24	71	1.5	3.23	0.1	3.23	6		**Included (Max > Table 9 SCS)**
Bromodichloromethane	Volatile	18	41	0.05	2	0.19	2	4	2	**Included (Max > Table 9 SCS)**
Bromoform	Volatile	18	41	0.05	2	0.05	2	3		**Included (Max > Table 9 SCS)**
Bromomethane	Volatile	18	41	0.05	3	0.05	3	3		**Included (Max > Table 9 SCS)**
Cadmium	Non-Volatile	26	75	1.2	50	0.5	50	4		**Included (Max > Table 9 SCS)**
Carbon tetrachloride	Volatile	18	41	0.05	2	0.05	2	4		**Included (Max > Table 9 SCS)**
Chlorobenzene	Volatile	18	41	0.05	2	0.25	2	3	1	**Included (Max > Table 9 SCS)**
Chlorodibromomethane	Volatile	18	41	0.05	81599.99	0.05	81599.99	4		**Included (Max > Table 9 SCS)**
Chloroethane	Volatile	1	2		0.005	0.19	0.19			**Included (No SCS; known to be present)**
Chloroform	Volatile	18	41	0.05	2	0.19	2	3	1	**Included (Max > Table 9 SCS)**
Chromium, Hexavalent (Cr6+)	Non-Volatile	24	74	0.66	6	0.2	6	7		**Included (Max > Table 9 SCS)**
Chrysene	Non-Volatile	25	59	2.8	103	0.05	103	3		**Included (Max > Table 9 SCS)**
cis-1,2-Dichloroethene	Volatile	18	41	0.05	2.9	0.05	2.9	4		**Included (Max > Table 9 SCS)**
Cobalt	Non-Volatile	26	75	22	71	9.99	71	2		**Included (Max > Table 9 SCS)**
Copper	Non-Volatile	26	75	92	420	9.99	420	4		**Included (Max > Table 9 SCS)**
Cyanide	Non-Volatile	25	74	0.051	0.05	0.09	0.09		1	**Included (Max > Table 9 SCS)**
Dibenzo(a,h)anthracene	Non-Volatile	25	59	0.1	13.8	9.99	13.8	4	1	**Included (Max > Table 9 SCS)**
Dichloromethane	Volatile	18	41	0.05	12800	0.05	12800	5		**Included (Max > Table 9 SCS)**
Electrical Conductivity [e, f]	NA	24	72	0.7	2.8		2.8	26		**Included (Max > Table 9 SCS)**
Ethylbenzene	Volatile	25	76	0.05	16799.99	4.99	16799.99	10	2	**Included (Max > Table 9 SCS)**
F1 (C6-C10) (max)	Volatile	25	66	25	830	5	830	7		**Included (Max > Table 9 SCS)**
F2 (C10-C16) (max)	Volatile	25	69	10	4200	10	4200	21		**Included (Max > Table 9 SCS)**
F3 (C16-C34) (max)	Non-Volatile	25	69	240	6700	50	6700	12		**Included (Max > Table 9 SCS)**
F4 (C34-C50) (max)	Non-Volatile	25	69	120	2300	50	2300	11		**Included (Max > Table 9 SCS)**
Fluoranthene	Non-Volatile	25	59	0.69	205	9.99	205	10	1	**Included (Max > Table 9 SCS)**
Fluorene	Non-Volatile	25	59	0.19	6.7	9.99	9.99	11	1	**Included (Max > Table 9 SCS)**
Indeno(1,2,3-Cd)Pyrene	Non-Volatile	25	59	0.23	43.4	0.05	43.4	7		**Included (Max > Table 9 SCS)**
Lead	Non-Volatile	26	75	120	1200		1200	13		**Included (Max > Table 9 SCS)**
Mercury	Non-Volatile	25	73	0.27	0.93	0.04	0.93	7		**Included (Max > Table 9 SCS)**

Table 9-3. Summary of Chemicals Detected and Maximum Concentrations in Soil (Land Less Than 30 m From Lake Ontario/Don River)
COC Screening - Table 9 Standards
Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 9 SCS [c] (mg/kg)	Max Detected Concentration (mg/kg)	Max Non-Detect Concentration (mg/kg)	Max Concentration [d] (mg/kg)	Count of Detects Above Table 9 SCS	Count of Non-Detects Above Table 9 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Methyl tert-butyl ether (MTBE)	Volatile	18	41	0.05	13000	0.09	13000	4	1	**Included (Max > Table 9 SCS)**
Molybdenum	Non-Volatile	26	75	2	250	75	250	6	1	**Included (Max > Table 9 SCS)**
Naphthalene	Volatile	25	59	0.09	59.99	0.05	59.99	8		**Included (Max > Table 9 SCS)**
n-Hexane	Volatile	8	29	0.05	0.83	0.05	0.83	2		**Included (Max > Table 9 SCS)**
PCB, Total	Non-Volatile	7	7	0.3	0.01	9.99	9.99		1	**Included (Max > Table 9 SCS)**
Phenanthrene	Non-Volatile	25	59	0.69	83	9.99	83	11	1	**Included (Max > Table 9 SCS)**
Pyrene	Non-Volatile	25	59	1	171	0.05	171	9		**Included (Max > Table 9 SCS)**
Selenium	Non-Volatile	26	75	1.5	250	270	270	4	1	**Included (Max > Table 9 SCS)**
Silver	Non-Volatile	26	75	0.5	39.99	0.69	39.99	3	1	**Included (Max > Table 9 SCS)**
Sodium Adsorption Ratio [e, f]	NA	25	71	5	42		42	9		**Included for Ecological RA (Max > Table 9 SCS) (f)**
Styrene	Volatile	18	41	0.05	13500	0.05	13500	4		**Included (Max > Table 9 SCS)**
Tetrachloroethene	Volatile	18	41	0.05	13300	0.05	13300	4		**Included (Max > Table 9 SCS)**
Toluene	Volatile	25	75	0.2	71500	0.08	71500	7		**Included (Max > Table 9 SCS)**
trans-1,2-Dichloroethene	Volatile	18	41	0.05	60099.99	0.05	60099.99	4		**Included (Max > Table 9 SCS)**
Trichloroethylene	Volatile	18	41	0.05	13300	0.19	13300	4	1	**Included (Max > Table 9 SCS)**
Trichlorofluoromethane	Volatile	9	31	0.25	12500	0.19	12500	1		**Included (Max > Table 9 SCS)**
Vinyl Chloride	Volatile	18	41	0.02	8540	0.19	8540	4	1	**Included (Max > Table 9 SCS)**
Xylenes, Total (max)	Volatile	25	76	0.05	116000	0.19	116000	15	1	**Included (Max > Table 9 SCS)**
Zinc	Non-Volatile	26	75	290	480	0.19	480	2		**Included (Max > Table 9 SCS)**
Aluminum	Non-Volatile	1	2	26000	100		100			Excluded (Max < or = OTR Value)
Boron	Non-Volatile	9	30	36	11	5	11			Excluded (Max < or = Table 9 SCS)
Chloromethane	Volatile	1	2			0.03	0.03			Excluded (No SCS, not detected, no elevated SDL)
Chromium	Non-Volatile	26	76	70	44.8	9.99	44.8			Excluded (Max < or = Table 9 SCS)
Dichlorodifluoromethane	Volatile	8	29	0.05		0.05	0.05			Excluded (Max < or = Table 9 SCS)
Iron	Non-Volatile	1	2	34000	15	9.99	15			Excluded (Max < or = OTR Value)
Manganese	Non-Volatile	1	2	1400	250	75	250			Excluded (Max < or = OTR Value)
Nickel	Non-Volatile	26	75	82	73	45	73			Excluded (Max < or = Table 9 SCS)
Phosphorus	Non-Volatile	1	2	1500		270	270			Excluded (Max < or = OTR Value)
Thallium	Non-Volatile	25	73	1	0.54	1	1			Excluded (Max < or = Table 9 SCS)
Titanium	Non-Volatile	1	2	4700		9.99	9.99			Excluded (Max < or = OTR Value)
Uranium (U)	Non-Volatile	8	29	2.5		1	1			Excluded (Max < or = Table 9 SCS)
Vanadium	Non-Volatile	26	75	86	59.99		59.99			Excluded (Max < or = Table 9 SCS)

Notes:
[a] (max) indicates the representative maximum concentration (the maximum concentration of similar analytes or total concentration of multiple isomers) is used for comparison.
[b] Indicates whether the parameter is considered volatile or non-volatile under MOECC-specified criteria.
[c] Ontario Regulation 153/04, *Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Groundwater Condition* (MOECC, 2011), for all COCs, except for aluminum, iron, manganese, phosphorus, and titanium, for which the *Ontario Typical Range* value (MOECC, 2011) is presented.
[d] Column lists the greater of the Maximum Detected Concentration and the Maximum Non-Detect Concentration.
[e] Units for electrical conductivity are mS/cm and units for sodium adsorption ratio are SAR.
[f] Parameter is not applicable to human health.

Bold parameters are identified as COCs
COC - contaminant of concern
Max - maximum concentration
mg/kg - milligrams per kilogram
MOECC - Ontario Ministry of the Environment and Climate Change
mS/cm - milliSiemens per centimetre
NA - not applicable
PCB - polychlorinated biphenyls
SAR - sodium adsorption ratio
SCS - site condition standard
SDL - sample detection limit

Table 9-4. Summary of Chemicals Detected and Maximum Concentrations in Groundwater (Land Greater Than 30 m from Lake Ontario/Don River)

COC Screening - Table 3 Standards

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 [c] SCS (µg/L)	Max Concentration Detected (µg/L)	Max Non-Detect Concentration (µg/L)	Max Concentration [d] (µg/L)	95th UCLM (µg/L)	Count of Detects Above Table 3 SCS	Count of Non-Detects Above Table 3 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
1,1,1,2-Tetrachloroethane	Volatile	140	162	3.3	25	440	440	20	9	9	**Included (Max > Table 3 SCS)**
1,1,2,2-Tetrachloroethane	Volatile	139	161	3.2	50	870	870	38	15	7	**Included (Max > Table 3 SCS)**
1,1,2-Trichloroethane	Volatile	139	153	4.7	50	440	440	22	13	8	**Included (Max > Table 3 SCS)**
1,1-Dichloroethane	Volatile	140	164	320	25	349.99	349.99	16		2	**Included (Max > Table 3 SCS)**
1,1-Dichloroethene	Volatile	137	159	1.6	25	440	440	20	15	9	**Included (Max > Table 3 SCS)**
1,2-Dibromoethane	Volatile	140	162	0.25	50	440	440	20	30	40	**Included (Max > Table 3 SCS)**
1,2-Dichloroethane	Volatile	139	161	1.6	50	440	440	21	19	9	**Included (Max > Table 3 SCS)**
1,2-Dichloropropane	Volatile	139	161	16	25	440	440	20	1	5	**Included (Max > Table 3 SCS)**
1,3-Dichloropropene (max)	Volatile	136	161	5.2	50	120	120	7.2	11	5	**Included (Max > Table 3 SCS)**
1,4-Dichlorobenzene	Volatile	139	165	8	50	440	440	20	9	7	**Included (Max > Table 3 SCS)**
1+2-Methylnaphthalenes (max)	Volatile	96	113	1800	2610	0.02	2610	200	2		**Included (Max > Table 3 SCS)**
2-Hexanone	Volatile	11	19			3	3	1			**Included (No SCS, not detected, with elevated SDL)**
Acenaphthene	Non-Volatile	142	165	600	823	300	823	33	1		**Included (Max > Table 3 SCS)**
Acenaphthylene	Non-Volatile	142	167	1.8	220	300	300	9.5	9	5	**Included (Max > Table 3 SCS)**
Anthracene	Non-Volatile	142	166	2.4	377	10	377	15	20	1	**Included (Max > Table 3 SCS)**
Barium	Non-Volatile	139	158	29000	42300	400	42300	1800	2		**Included (Max > Table 3 SCS)**
Benzene	Volatile	150	238	44	3000	4700	4700	160	49	3	**Included (Max > Table 3 SCS)**
Benzo(a)anthracene	Non-Volatile	142	167	4.7	319.99	90	319.99	9.7	8	1	**Included (Max > Table 3 SCS)**
Benzo(a)pyrene	Non-Volatile	142	166	0.81	209.99	0.5	209.99	6.2	25		**Included (Max > Table 3 SCS)**
Benzo(b&j)fluoranthene	Non-Volatile	141	181	0.75	259.99	90	259.99	6.9	25	2	**Included (Max > Table 3 SCS)**
Benzo(g,h,i)perylene	Non-Volatile	142	167	0.2	72.99	190	190	4.8	42	9	**Included (Max > Table 3 SCS)**
Benzo(k)fluoranthene	Non-Volatile	142	167	0.4	100	10	100	2.5	24	7	**Included (Max > Table 3 SCS)**
Bromomethane	Volatile	139	161	5.6	130	2599.99	2599.99	110	15	8	**Included (Max > Table 3 SCS)**
Carbon tetrachloride	Volatile	140	162	0.79	25	440	440	19	19	12	**Included (Max > Table 3 SCS)**
Chloride (Cl)	Non-Volatile	92	101	2300000	14000000	130	14000000	1100000	5		**Included (Max > Table 3 SCS)**
Chloroethane	Volatile	11	19		5.9	2	5.9	2.4			**Included (No SCS; known to be present)**
Chloroform	Volatile	140	162	2.4	25	170	170	8.5	13	9	**Included (Max > Table 3 SCS)**
Chloromethane	Volatile	11	19			4	4	1.2			**Included (No SCS, not detected, with elevated SDL)**
Chrysene	Non-Volatile	142	167	1	280	40	280	7.7	24	1	**Included (Max > Table 3 SCS)**
cis-1,2-Dichloroethene	Volatile	134	155	1.6	9699.99	430	9699.99	290	22	6	**Included (Max > Table 3 SCS)**
Copper	Non-Volatile	145	164	87	138	24	138	7.2	2		**Included (Max > Table 3 SCS)**
Cyanide	Non-Volatile	103	120	66	180	9.99	180	7.5	1		**Included (Max > Table 3 SCS)**
Dibenzo(a,h)anthracene	Non-Volatile	142	167	0.52	26	90	90	2.3	9	11	**Included (Max > Table 3 SCS)**
Dichloromethane	Volatile	140	162	610	640	870	870	49	1	2	**Included (Max > Table 3 SCS)**
Electrical Conductivity [e]	Non-Volatile	61	75	3.16	36		36	4.7			**Included (Max > PGMIS background)**
Ethylbenzene	Volatile	151	243	2300	9520	520	9520	470	11		**Included (Max > Table 3 SCS)**
F1 (C6-C10) (max)	Volatile	145	215	750	103000	10000	103000	4200	61	3	**Included (Max > Table 3 SCS)**
F2 (C10-C16) (max)	Volatile	145	200	150	76000	4100	76000	3700	94	2	**Included (Max > Table 3 SCS)**
F3 (C16-C34) (max)	Non-Volatile	145	190	500	120000	500	120000	3600	57		**Included (Max > Table 3 SCS)**
F4 (C34-C50)	Non-Volatile	144	183	500	6200	500	6200	470	20		**Included (Max > Table 3 SCS)**
Fluoranthene	Non-Volatile	136	159	130	248	50	248	10	3		**Included (Max > Table 3 SCS)**
Indeno(1,2,3-Cd)Pyrene	Non-Volatile	142	167	0.2	70	190	190	4.8	38	10	**Included (Max > Table 3 SCS)**
Lead	Non-Volatile	145	164	25	1140	5	1140	26	6		**Included (Max > Table 3 SCS)**
Mercury	Non-Volatile	141	160	0.29	17.1	0.1	17.1	0.77	21		**Included (Max > Table 3 SCS)**
Methyl tert-butyl ether (MTBE)	Volatile	140	162	190	50	1700	1700	75		5	**Included (Max > Table 3 SCS)**
Naphthalene	Volatile	133	153	1400	4310	1900	4310	190	3	1	**Included (Max > Table 3 SCS)**
Nitrate (as N)	Non-Volatile	37	38	11500	128000		128000	0.04			**Included (Max > PGMIS background)**
Nitrate-Nitrite (as N)	Non-Volatile	37	38	11500	128000		128000	10000			**Included (Max > PGMIS background)**
Phenanthrene	Non-Volatile	142	166	580	1300	90	1300	53	4		**Included (Max > Table 3 SCS)**
Pyrene	Non-Volatile	137	160	68	720	110	720	24	4	1	**Included (Max > Table 3 SCS)**

Table 9-4. Summary of Chemicals Detected and Maximum Concentrations in Groundwater (Land Greater Than 30 m from Lake Ontario/Don River)

COC Screening - Table 3 Standards

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 [c] SCS (µg/L)	Max Concentration Detected (µg/L)	Max Non-Detect Concentration (µg/L)	Max Concentration [d] (µg/L)	95th UCLM (µg/L)	Count of Detects Above Table 3 SCS	Count of Non-Detects Above Table 3 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Silver	Non-Volatile	139	158	1.5	1	5	5	0.54		3	**Included (Max > Table 3 SCS)**
Sodium	Non-Volatile	122	135	2300000	7330000	890000	7330000	460000	4		**Included (Max > Table 3 SCS)**
Tetrachloroethene	Volatile	139	161	1.6	25	440	440	20	15	9	**Included (Max > Table 3 SCS)**
Toluene	Volatile	151	240	18000	46299.99	220	46299.99	1400	4		**Included (Max > Table 3 SCS)**
trans-1,2-Dichloroethene	Volatile	140	162	1.6	25	870	870	32	18	9	**Included (Max > Table 3 SCS)**
Trichloroethylene	Volatile	138	168	1.6	25	440	440	19	15	9	**Included (Max > Table 3 SCS)**
Vinyl Chloride	Volatile	139	161	0.5	870	86.99	870	35	35	10	**Included (Max > Table 3 SCS)**
Xylenes, Total (max)	Volatile	151	240	4200	37000	190	37000	1700	11		**Included (Max > Table 3 SCS)**
1,1,1-Trichloroethane	Volatile	140	162	640	25	220	220	11			Excluded (Max < or = Table 3 SCS)
1,2,4-Trichlorobenzene	Volatile	18	27	180		3	3	0.85			Excluded (Max < or = Table 3 SCS)
1,2-Dichlorobenzene	Volatile	140	166	4600	50	440	440	21			Excluded (Max < or = Table 3 SCS)
1,3-Dichlorobenzene	Volatile	140	166	9600	50	440	440	20			Excluded (Max < or = Table 3 SCS)
2,4,5-Trichlorophenol	Non-Volatile	3	4	1600		4.99	4.99	5			Excluded (Max < or = Table 3 SCS)
2,4,6-Trichlorophenol	Non-Volatile	3	4	230		4.99	4.99	5			Excluded (Max < or = Table 3 SCS)
2,4-Dichlorophenol	Non-Volatile	3	4	4600		4.99	4.99	5.2			Excluded (Max < or = Table 3 SCS)
2,4-Dimethylphenol	Non-Volatile	3	4	39000	67	20	67	78			Excluded (Max < or = Table 3 SCS)
2,4-Dinitrophenol	Non-Volatile	3	4	11000		20	20	30			Excluded (Max < or = Table 3 SCS)
2,4&2,6-Dinitrotoluene (max)	Non-Volatile	9	11	2900		3	3	2.3			Excluded (Max < or = Table 3 SCS)
2-Butanone	Volatile	140	162	470000	1300	13000	13000	600			Excluded (Max < or = Table 3 SCS)
2-Chloronaphthalene	Non-Volatile	6	7			1	1	1			Excluded (No SCS, not detected, no elevated SDL)
2-Chlorophenol	Volatile	3	4	3300		1	1	1			Excluded (Max < or = Table 3 SCS)
3,3`-Dichlorobenzidine	Non-Volatile	9	11	640		25	25	25			Excluded (Max < or = Table 3 SCS)
4-Bromophenyl Phenyl Ether	Non-Volatile	6	7			0.3	0.3	0.3			Excluded (No SCS, not detected, no elevated SDL)
4-Chloroaniline	Non-Volatile	3	4	400		9.99	9.99	10			Excluded (Max < or = Table 3 SCS)
4-Chlorophenyl Phenylether	Non-Volatile	6	7			0.5	0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
4-Methyl-2-Pentanone	Volatile	140	162	140000	1300	8699.99	8699.99	420			Excluded (Max < or = Table 3 SCS)
Acetone	Volatile	140	162	130000	2500	13000	13000	650			Excluded (Max < or = Table 3 SCS)
Antimony	Non-Volatile	139	158	20000	12	10	12	1.5			Excluded (Max < or = Table 3 SCS)
Arsenic	Non-Volatile	139	158	1900	50.79	16	50.79	5.7			Excluded (Max < or = Table 3 SCS)
Benzo(e)pyrene	Non-Volatile	5	5			0.05	0.05	0.05			Excluded (No SCS, not detected, no elevated SDL)
Beryllium	Non-Volatile	133	151	67	5	10	10	1.2			Excluded (Max < or = Table 3 SCS)
Bis (2-chloroethoxy) methane	Non-Volatile	6	7			2	2	2			Excluded (No SCS, not detected, no elevated SDL)
Bis (2-chloroethyl) ether	Volatile	3	4	300000		4.99	4.99	5			Excluded (Max < or = Table 3 SCS)
bis (2-Chloroisopropyl) ether	Non-Volatile	8	10	20000		4.99	4.99	4.3			Excluded (Max < or = Table 3 SCS)
Bis (2-ethylhexyl) phthalate	Non-Volatile	9	11	140		9.99	9.99	7.6			Excluded (Max < or = Table 3 SCS)
Boron	Non-Volatile	139	158	45000	20000	3000	20000	1000			Excluded (Max < or = Table 3 SCS)
Bromodichloromethane	Volatile	140	162	85000	25	170	170	9			Excluded (Max < or = Table 3 SCS)
Bromoform	Volatile	139	161	380	50	170	170	11			Excluded (Max < or = Table 3 SCS)
Butyl benzyl phthalate	Non-Volatile	6	7			0.5	0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
Cadmium	Non-Volatile	145	164	2.7	1	1	1	0.35			Excluded (Max < or = Table 3 SCS)
Chlorobenzene	Volatile	140	162	630	25	440	440	20			Excluded (Max < or = Table 3 SCS)
Chlorodibromomethane	Volatile	140	162	82000	50	170	170	9.8			Excluded (Max < or = Table 3 SCS)
Chromium	Non-Volatile	145	205	810	50	50	50	7.3			Excluded (Max < or = Table 3 SCS)
Chromium, Hexavalent (Cr6+)	Non-Volatile	91	101	140	23	10	23	8.9			Excluded (Max < or = Table 3 SCS)
Cobalt	Non-Volatile	139	158	66	30	10	30	4.5			Excluded (Max < or = Table 3 SCS)
Dichlorodifluoromethane	Volatile	58	66	4400		50	50	4.2			Excluded (Max < or = Table 3 SCS)
Diethylphthalate	Non-Volatile	9	11	38		9.99	9.99	3.6			Excluded (Max < or = Table 3 SCS)
Dimethylphthalate	Non-Volatile	9	11	38		2	2	2			Excluded (Max < or = Table 3 SCS)
Di-N-Butylphthalate	Non-Volatile	6	7			2	2	2			Excluded (No SCS, not detected, no elevated SDL)
Di-n-octyl phthalate	Non-Volatile	6	7			2	2	2			Excluded (No SCS, not detected, no elevated SDL)

Table 9-4. Summary of Chemicals Detected and Maximum Concentrations in Groundwater (Land Greater Than 30 m from Lake Ontario/Don River)

COC Screening - Table 3 Standards

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 3 [c] SCS (µg/L)	Max Concentration Detected (µg/L)	Max Non-Detect Concentration (µg/L)	Max Concentration [d] (µg/L)	95th UCLM (µg/L)	Count of Detects Above Table 3 SCS	Count of Non-Detects Above Table 3 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Fluorene	Non-Volatile	142	166	400	352	390	390	19			Excluded (Max < or = Table 3 SCS)
Hexachlorobenzene	Non-Volatile	6	7	3.1		1	1	1			Excluded (Max < or = Table 3 SCS)
Hexachloroethane	Volatile	3	4	94		2	2	2			Excluded (Max < or = Table 3 SCS)
Isophorone	Non-Volatile	6	7			0.5	0.5	0.5			Excluded (No SCS, not detected, no elevated SDL)
Molybdenum	Non-Volatile	139	158	9200	56	65	65	4.4			Excluded (Max < or = Table 3 SCS)
n-Hexane	Volatile	56	64	51		50	50	3.2			Excluded (Max < or = Table 3 SCS)
Nickel	Non-Volatile	145	164	490	84.79	50	84.79	8.2			Excluded (Max < or = Table 3 SCS)
Nitrite (as N)	Non-Volatile	44	45	121	55	0.04	55	13			Excluded (Max < or = PGMIS background)
N-Nitrosodi-N-propylamine	Non-Volatile	6	7			2	2	2			Excluded (No SCS, not detected, no elevated SDL)
N-Nitrosodiphenylamine	Non-Volatile	6	7			2	2	2			Excluded (No SCS, not detected, no elevated SDL)
PCB, Total	Non-Volatile	15	16	7.8	0.19	0.5	0.5	0.16			Excluded (Max < or = Table 3 SCS)
Pentachlorophenol	Non-Volatile	3	4	62		4.99	4.99	5.2			Excluded (Max < or = Table 3 SCS)
Perylene	Non-Volatile	5	5			0.05	0.05	0.05			Excluded (No SCS, not detected, no elevated SDL)
Phenol	Non-Volatile	3	4	12000		4.99	4.99	5			Excluded (Max < or = Table 3 SCS)
Selenium	Non-Volatile	139	158	63	20.1	10	20.1	2.9			Excluded (Max < or = Table 3 SCS)
Styrene	Volatile	140	162	1300	50	440	440	20			Excluded (Max < or = Table 3 SCS)
Thallium	Non-Volatile	139	158	510	0.56	1	1	0.33			Excluded (Max < or = Table 3 SCS)
Trichlorofluoromethane	Volatile	69	85	2500		25	25	4.8			Excluded (Max < or = Table 3 SCS)
Uranium (U)	Non-Volatile	58	66	420	7.33	1	7.33	1.6			Excluded (Max < or = Table 3 SCS)
Vanadium	Non-Volatile	139	158	250	30.8	50	50	4.8			Excluded (Max < or = Table 3 SCS)
Zinc	Non-Volatile	145	164	1100	230	100	230	23			Excluded (Max < or = Table 3 SCS)

Notes:

[a] (max) Indicates the representative maximum concentration (the maximum concentration of similar analytes or total concentration of multiple isomers) is used for comparison.

[b] Indicates whether the parameter is considered volatile or non-volatile under MOECC-specified criteria.

[c] Ontario Regulation 153/04, *Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition* (All land uses) (MOECC, 2011) for all COCs, for all COCs, except for electrical conductivity and nitrate/nitrite, for which the 97.5th percentile of the Provincial Groundwater Monitoring Information System (PGMIS) value (MOECC, 2011) is presented.

[d] Column lists the greater of the maximum concentration between Max Detected Concentration and Max Non-Detect Concentration.

[e] Units for electrical conductivity are mS/cm.

Bold parameters are identified as COCs

µg/L - microgram per litre

COC - contaminant of concern

Max - maximum concentration

MOECC - Ontario Ministry of the Environment and Climate Change

mS/cm - milliSiemens per centimetre

SCS - site condition standard

SDL - sample detection limit

Table 9-5. Summary of Chemicals Detected and Maximum Concentrations in Groundwater (Land Less Than 30 m From Lake Ontario/Don River)

COC Screening - Table 9 Standards

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 9 [c] SCS (µg/L)	Max Concentration Detected (µg/L)	Max Non-Detect Concentration (µg/L)	Max Concentration [d] (µg/L)	95th UCLM (µg/L)	Count of Detects Above Table 9 SCS	Count of Non-Detects Above Table 9 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
1,1,1,2-Tetrachloroethane	Volatile	27	28	3.3	5	0.5	5	1.2	2		**Included (Max > Table 9 SCS)**
1,1,2,2-Tetrachloroethane	Volatile	27	28	3.2	10	0.5	10	2.1	2		**Included (Max > Table 9 SCS)**
1,1,2-Trichloroethane	Volatile	27	28	4.7	10	0.5	10	2.1	2		**Included (Max > Table 9 SCS)**
1,1-Dichloroethene	Volatile	27	28	1.6	5	0.5	5	1.2	2		**Included (Max > Table 9 SCS)**
1,2-Dibromoethane	Volatile	27	28	0.25	10	0.5	10	2	7	1	**Included (Max > Table 9 SCS)**
1,2-Dichloroethane	Volatile	27	28	1.6	10	0.5	10	2.1	2		**Included (Max > Table 9 SCS)**
1,3-Dichloropropene (max)	Volatile	26	26	5.2	10	0.5	10	2.2	2		**Included (Max > Table 9 SCS)**
1,4-Dichlorobenzene	Volatile	27	28	8	10	0.5	10	2.1	2		**Included (Max > Table 9 SCS)**
2-Hexanone	Volatile	1	2			0.09	0.09	0.61			**Included (No SCS, not detected, with elevated SDL)**
Acenaphthylene	Non-Volatile	28	29	1.4	4	0.02	4	0.65	3		**Included (Max > Table 9 SCS)**
Anthracene	Non-Volatile	28	29	1	7.1	0.02	7.1	1.1	3		**Included (Max > Table 9 SCS)**
Benzene	Volatile	28	29	44	420	0.5	420	56	2		**Included (Max > Table 9 SCS)**
Benzo(a)anthracene	Non-Volatile	28	29	1.8	24	0.09	24	2.9	2		**Included (Max > Table 9 SCS)**
Benzo(a)pyrene	Non-Volatile	28	29	0.81	28	0.09	28	3.3	5		**Included (Max > Table 9 SCS)**
Benzo(b&j)fluoranthene	Non-Volatile	28	29	0.75	16	0.09	16	2.1	5		**Included (Max > Table 9 SCS)**
Benzo(g,h,i)perylene	Non-Volatile	28	29	0.2	16	0.09	16	1.9	8		**Included (Max > Table 9 SCS)**
Benzo(k)fluoranthene	Non-Volatile	28	29	0.4	6	0.02	6	0.77	4		**Included (Max > Table 9 SCS)**
Bismuth	Non-Volatile	1	2		11	0.002	11	75			**Included (No SCS; known to be present)**
Bromomethane	Volatile	27	28	5.6	25	0.5	25	6.2	3		**Included (Max > Table 9 SCS)**
Cadmium	Non-Volatile	28	29	2.1	23	0.19	23	2.5	1		**Included (Max > Table 9 SCS)**
Carbon tetrachloride	Volatile	27	28	0.79	27	0.2	27	3.5	3		**Included (Max > Table 9 SCS)**
Chloride (Cl)	Non-Volatile	28	29	1800000	2500000	0.003	2500000	680000	2		**Included (Max > Table 9 SCS)**
Chloroethane	Volatile	1	2		21	0.003	21	140			**Included (No SCS; known to be present)**
Chloroform	Volatile	27	28	2.4	5	1	5	1.5	2		**Included (Max > Table 9 SCS)**
Chloromethane	Volatile	1	2			0.5	0.5	3.4			**Included (No SCS, not detected, with elevated SDL)**
Chrysene	Non-Volatile	28	29	0.7	3.2	0.5	3.2	0.66	4		**Included (Max > Table 9 SCS)**
cis-1,2-Dichloroethene	Volatile	27	28	1.6	40	0.5	40	5.1	3		**Included (Max > Table 9 SCS)**
Cobalt	Non-Volatile	28	29	52	60	1	60	8.5	1		**Included (Max > Table 9 SCS)**
Dibenzo(a,h)anthracene	Non-Volatile	28	29	0.4	1.88	0.02	1.88	0.33	3		**Included (Max > Table 9 SCS)**
Electrical Conductivity [e]	Non-Volatile	18	18	3.16	6.23		6.23	2.8			**Included (Max > Table 9 SCS)**
F1 (C6-C10) (max)	Volatile	28	29	420	3200	25	3200	550	2		**Included (Max > Table 9 SCS)**
F2 (C10-C16) (max)	Volatile	27	27	150	14000	100	14000	1700	5		**Included (Max > Table 9 SCS)**
F3 (C16-C34) (max)	Non-Volatile	28	29	500	2600	250	2600	550	3		**Included (Max > Table 9 SCS)**
Indeno(1,2,3-Cd)Pyrene	Non-Volatile	28	29	0.2	2.7	0.5	2.7	0.44	7	1	**Included (Max > Table 9 SCS)**
Mercury	Non-Volatile	27	27	0.29	1.5	0.01	1.5	0.2	1		**Included (Max > Table 9 SCS)**
PCB, Total	Non-Volatile	1	2	0.2	142		142	940	2		**Included (Max > Table 9 SCS)**
Pyrene	Non-Volatile	28	29	5.7	11	0.02	11	2.5	3		**Included (Max > Table 9 SCS)**
Silver	Non-Volatile	28	29	1.2	4	0.5	4	0.66	1		**Included (Max > Table 9 SCS)**
Tetrachloroethene	Volatile	27	28	1.6	107	0.5	107	13	4		**Included (Max > Table 9 SCS)**
Tin	Non-Volatile	1	2		40.1		40.1	270			**Included (No SCS; known to be present)**
trans-1,2-Dichloroethene	Volatile	27	28	1.6	321	0.5	321	36	3		**Included (Max > Table 9 SCS)**
Trichloroethylene	Volatile	27	28	1.6	100	0.5	100	12	3		**Included (Max > Table 9 SCS)**
Vinyl Chloride	Volatile	27	28	0.5	39	0.5	39	5.8	7		**Included (Max > Table 9 SCS)**
1,1,1-Trichloroethane	Volatile	27	28	640	5	0.5	5	1.2			Excluded (Max < or = Table 9 SCS)
1,1-Dichloroethane	Volatile	27	28	320	5	0.5	5	1.2			Excluded (Max < or = Table 9 SCS)
1,2-Dichlorobenzene	Volatile	27	28	4600	10	0.5	10	2.1			Excluded (Max < or = Table 9 SCS)
1,2-Dichloropropane	Volatile	27	28	16	5	0.5	5	1.2			Excluded (Max < or = Table 9 SCS)
1,3-Dichlorobenzene	Volatile	27	28	7600	10	0.5	10	2.1			Excluded (Max < or = Table 9 SCS)

Table 9-5. Summary of Chemicals Detected and Maximum Concentrations in Groundwater (Land Less Than 30 m From Lake Ontario/Don River)

COC Screening - Table 9 Standards

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 9 [c] SCS (µg/L)	Max Concentration Detected (µg/L)	Max Non-Detect Concentration (µg/L)	Max Concentration [d] (µg/L)	95th UCLM (µg/L)	Count of Detects Above Table 9 SCS	Count of Non-Detects Above Table 9 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
1+2-Methylnaphthalenes (max)	Volatile	28	29	1500	170	0.09	170	19			Excluded (Max < or = Table 9 SCS)
2-Butanone	Volatile	27	28	470000	250	20	250	58			Excluded (Max < or = Table 9 SCS)
4-Methyl-2-Pentanone	Volatile	27	28	140000	250	20	250	58			Excluded (Max < or = Table 9 SCS)
Acenaphthene	Non-Volatile	28	29	600	15	0.09	15	2.3			Excluded (Max < or = Table 9 SCS)
Acetone	Volatile	27	28	100000	500	30	500	110			Excluded (Max < or = Table 9 SCS)
Aluminum	Non-Volatile	1	2	86.9	0.34	0.005	0.34	2.3			Excluded (Max < or = PGMIS background)
Antimony	Non-Volatile	28	29	16000	5	1	5	1.3			Excluded (Max < or = Table 9 SCS)
Arsenic	Non-Volatile	28	29	1500	13	1	13	4			Excluded (Max < or = Table 9 SCS)
Barium	Non-Volatile	28	29	23000	2690	0.5	2690	770			Excluded (Max < or = Table 9 SCS)
Beryllium	Non-Volatile	28	29	53	8.99	1	8.99	1.8			Excluded (Max < or = Table 9 SCS)
Boron	Non-Volatile	28	29	36000	2440	0.002	2440	640			Excluded (Max < or = Table 9 SCS)
Bromodichloromethane	Volatile	27	28	67000	12	2	12	3			Excluded (Max < or = Table 9 SCS)
Bromoform	Volatile	27	28	380	11	5	11	5.6			Excluded (Max < or = Table 9 SCS)
Calcium	Non-Volatile	1	2	431000	12	0.19	12	81			Excluded (Max < or = PGMIS background)
Chlorobenzene	Volatile	27	28	500	25	0.5	25	3.5			Excluded (Max < or = Table 9 SCS)
Chlorodibromomethane	Volatile	27	28	65000	10	2	10	3			Excluded (Max < or = Table 9 SCS)
Chromium	Non-Volatile	28	29	640	50	5	50	11			Excluded (Max < or = Table 9 SCS)
Chromium, Hexavalent (Cr6+)	Non-Volatile	27	27	110	7	10	10	9.4			Excluded (Max < or = Table 9 SCS)
Copper	Non-Volatile	28	29	69	10	2	10	3			Excluded (Max < or = Table 9 SCS)
Cyanide	Non-Volatile	27	27	52	2.8	2	2.8	2.1			Excluded (Max < or = Table 9 SCS)
Dichlorodifluoromethane	Volatile	18	18	3500		2	2	2			Excluded (Max < or = Table 9 SCS)
Dichloromethane	Volatile	27	28	610	65	5	65	12			Excluded (Max < or = Table 9 SCS)
Ethylbenzene	Volatile	28	30	1800	66	0.5	66	8.1			Excluded (Max < or = Table 9 SCS)
F4 (C34-C50)	Non-Volatile	27	27	500	370	250	370	240			Excluded (Max < or = Table 9 SCS)
Fluoranthene	Non-Volatile	28	29	73	11	0.5	11	1.9			Excluded (Max < or = Table 9 SCS)
Fluorene	Non-Volatile	28	29	290	20	0.5	20	2.6			Excluded (Max < or = Table 9 SCS)
Iron	Non-Volatile	1	2	4090		0.5	0.5	3.4			Excluded (Max < or = PGMIS background)
Lead	Non-Volatile	28	29	20	5	0.5	5	1.2			Excluded (Max < or = Table 9 SCS)
Magnesium	Non-Volatile	1	2	134000		0.5	0.5	3.4			Excluded (Max < or = PGMIS background)
Manganese	Non-Volatile	1	2	717		0.5	0.5	3.4			Excluded (Max < or = PGMIS background)
Methyl tert-butyl ether (MTBE)	Volatile	27	28	190	10	2	10	3.1			Excluded (Max < or = Table 9 SCS)
Molybdenum	Non-Volatile	28	29	7300	25	0.5	25	4.6			Excluded (Max < or = Table 9 SCS)
Naphthalene	Volatile	28	29	1400	23	0.09	23	2.6			Excluded (Max < or = Table 9 SCS)
n-Hexane	Volatile	18	18	51		0.5	0.5	0.5			Excluded (Max < or = Table 9 SCS)
Nickel	Non-Volatile	28	29	390	61	5	61	10			Excluded (Max < or = Table 9 SCS)
Nitrate (as N)	Non-Volatile	9	9	11500	550		550	200			Excluded (Max < or = PGMIS background)
Nitrate-Nitrite (as N)	Non-Volatile	9	9	11500	550		550	270			Excluded (Max < or = PGMIS background)
Nitrite (as N)	Non-Volatile	9	9	121	10		10	10			Excluded (Max < or = PGMIS background)
Phenanthrene	Non-Volatile	28	29	380	50	0.02	50	6.4			Excluded (Max < or = Table 9 SCS)
Phosphorus	Non-Volatile	1	2	7970	4	0.002	4	27			Excluded (Max < or = PGMIS background)
Potassium	Non-Volatile	1	2	20700	3	0.002	3	21			Excluded (Max < or = PGMIS background)
Selenium	Non-Volatile	28	29	50	20	0.5	20	4.5			Excluded (Max < or = Table 9 SCS)
Sodium	Non-Volatile	28	29	1800000	1500000	0.09	1500000	350000			Excluded (Max < or = Table 9 SCS)
Strontium	Non-Volatile	1	2	20200	3	0.09	3	20			Excluded (Max < or = PGMIS background)
Styrene	Volatile	27	28	1300	106	0.5	106	13			Excluded (Max < or = Table 9 SCS)
Thallium	Non-Volatile	28	29	400	51.1	0.1	51.1	5.5			Excluded (Max < or = Table 9 SCS)
Titanium	Non-Volatile	1	2	4.8	0.0007		0.0007	0.0048			Excluded (Max < or = PGMIS background)
Toluene	Volatile	28	29	14000	14	0.5	14	2.4			Excluded (Max < or = Table 9 SCS)

Table 9-5. Summary of Chemicals Detected and Maximum Concentrations in Groundwater (Land Less Than 30 m From Lake Ontario/Don River)

COC Screening - Table 9 Standards

Port Lands, Toronto, Ontario

Parameter [a]	Volatility Designation [b]	No. of Stations	No. of Samples	Table 9 [c] SCS (µg/L)	Max Concentration Detected (µg/L)	Max Non-Detect Concentration (µg/L)	Max Concentration [d] (µg/L)	95th UCLM (µg/L)	Count of Detects Above Table 9 SCS	Count of Non-Detects Above Table 9 SCS (Using Max SDL)	Included/Excluded as COC (Rationale)
Trichlorofluoromethane	Volatile	19	20	2000	106	5	106	20			Excluded (Max < or = Table 9 SCS)
Uranium (U)	Non-Volatile	19	20	330	14	0.1	14	2.8			Excluded (Max < or = Table 9 SCS)
Vanadium	Non-Volatile	28	29	200	10	5	10	3.8			Excluded (Max < or = Table 9 SCS)
Xylenes, Total (max)	Volatile	28	31	3300	57	0.5	57	7.8			Excluded (Max < or = Table 9 SCS)
Zinc	Non-Volatile	28	29	890	50	10	50	15			Excluded (Max < or = Table 9 SCS)

Notes:

[a] (max) Indicates the representative maximum concentration (the maximum concentration of similar analytes or total concentration of multiple isomers) is used for comparison.

[b] Indicates whether the parameter is considered volatile or non-volatile under MOECC-specified criteria.

[c] Ontario Regulation 153/04, Table 9: Generic Site Condition Standards for Use within 30 m of a Water Body in a Non-Potable Groundwater Condition (All land uses) (MoECC, 2011) for all COCs, for all COCs, except for aluminum, calcium, electrical conductivity, iron, manganese, magnesium, nitrate/nitrite, phosphorus, potassium, strontium, and titanium, for which the 97.5th percentile of the Provincial Groundwater Monitoring Information System (PGMIS) value (MOECC, 2011) is presented.

[d] Column lists the greater of the maximum concentration between Max Detected Concentration and Max Non-Detect Concentration.

[e] Units for electrical conductivity are mS/cm.

Bold parameters are identified as COCs

µg/L - microgram per litre

COC - contaminant of concern

Max - maximum concentration

MOECC - Ontario Ministry of the Environment and Climate Change

mS/cm - milliSiemens per centimetre

SCS - site condition standard

SDL - sample detection limit

Table 11-1. Generic Exposure Assumptions

Port Lands, Toronto, ON

Parameter	Units	Symbol	Infant Resident (0 - 5 mo.)	Toddler Resident (6 mo. - 4 y)	Child Resident (5 - 11 y)	Teen Resident (12 - 19 y)	Adult Resident (20+ y)	Composite Resident	Indoor Worker (Long Term)	Outdoor Worker (Long Term)	Utility Worker (Long Term)	Construction Worker	Female Adult Worker
Body Weight	kg_{BW}	BW	8.2	16.5	32.9	59.7	70.7	NA [a]	70.7	70.7	70.7	70.7	63.1
Exposure Duration	years	ED	0.5	4.5	7	8	56	NA [a]	56	56	56	1.5	56
Averaging $Time_{NC}$	days	AT_{NC}	182.5 [b]	1642.5	2555 [b]	2920 [b]	20440 [b]	NA [a]	20440	20440	20440	547.5	20440
Averaging $Time_{C}$	days	AT_{C}	182.5 [c]	1642.5 [c]	2555 [c]	2920 [c]	20440 [c]	27740 [d]	20440	20440	20440	20440	20440
Frequency of Exposure for Outdoors	weeks/year	$EF1_{OD}$	39	39	39	39	39	39 [e]	39	39/37/2 [h]	2	39	52 [k]
Frequency of Exposure for Indoors	weeks/year	$EF1_{ID}$	50	50	50	50	50	50 [e]	50	0	0	0	52 [k]
Frequency of Exposure for Indoors and/or Outdoors	days/week	EF2	7	7	7	7	7	7 [e]	5	1 [j]	5	5	7
Frequency of Exposure for Outdoors	hours/day	$EF3_{OD}$	2 [f]	2 [f]	4 [f]	4 [f]	2 [f]	NA [a]	0.5 [i]	9.8 [g]	9.8 [g]	9.8	24 [k]
Frequency of Exposure for Indoors	hours/day	$EF3_{ID}$	24	24	22.23	21.83	22.5	NA [a]	9.8	0	0	0	24 [k]

Notes:

a. Not applicable. Composite receptor is a sum of the individual receptor ages.

b. Assumed. Rationale Document (MOECC, 2011) says "Averaging Period for non-cancer is equivalent to exposure duration for each receptor" but does not list all age groups.

c. Value presented to support development of total carcinogenic averaging time of composite receptor by summing of individual age groupings. Carcinogenic risk is not calculated for the individual age groupings.

d. Carcinogenic averaging time is the equivalent of 76 years multliplied by 365 days per year, or the sum of the averaging times of all receptors composing the composite receptor.

e. Value referenced is for carcinogens only.

f. Professional Judgement: conservatively assumes adults spend 2 hours outside per day, and young children would only be outside with an adult. Conservatively assumes older children and teens could be outside twice as long.

g. Assumed, but consistent with MOECC for Construction Worker scenario.

h. For Outdoor Worker, apply 39 weeks/year for dermal and incidental ingestion soil exposure, 37 weeks/year for average dust exposure, and 2 weeks/year for exposure to elevated dust levels (during planting and landscaping).

i. Professional Judgement: assumes Indoor Workers spend on average 0.5 hours outdoors per day (for example, walking to and from car and lunch break).

j. Assumed. Expect Outdoor Workers to be present onsite once per week to mow the lawn and maintain flower beds.

k. Prorating is not applied when considering a pregnant adult.

All values outlined are taken from *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario* , Ontario Ministry of the Environment and Climate Change, April 15, 2011 (MOECC, 2011).

Values not referenced in the Rationale Document (MOECC, 2011) or those requiring additional information are identified above where relevant.

Averaging $Time_{C}$ - Averaging time for carcinogens

Averaging $Time_{NC}$ - Averaging time for non-carcinogens

kg_{BW} - kilograms body weight

mo - month(s)

MOECC - Ontario Ministry of the Environment and Climate Change

NA - not available

y - year(s)

Table 11-2. Dermal Exposure Assumptions

Port Lands, Toronto, ON

Parameter	Units	Symbol	Infant Resident (0 - 5 mo.)	Toddler Resident (6 mo. - 4 y)	Child Resident (5 - 11 y)	Teen Resident (12 - 19 y)	Adult Resident (20+ y)	Composite Resident	Indoor Worker (Long Term)	Outdoor Worker (Long Term)	Utility Worker (Long Term)	Construction Worker	Female Adult Worker
Soil Adherence Factor	$mg/cm^2/day$	SAF	0.07	0.2	0.2	0.07	0.07	NA [a]	0.07	0.2	0.2	0.2	0.07/0.2 [g]
Skin Surface Area - Arms	cm^2		550	890	1480	2230	2500	NA [a]	2500	NA	NA	NA	NA
Skin Surface Area - Hands	cm^2		320	430	590	800	890	NA [a]	890	890	890	890	820
Skin Surface Area - Legs	cm^2		910	1690	3070	4970	5720	NA [a]	5720	NA	NA	NA	NA
Skin Surface Area - Feet	cm^2		250	430	720	1080	1190	NA [a]	1190	NA	NA	NA	NA
Skin Surface Area - Head	cm^2		275	445	740	1115	1250	NA [a]	1250	1255	1255	1255	1135
Skin Surface Area - Forearms	cm^2		275	445	740	1115	1250	NA [a]	1250	1255	1255	1255	1135
Skin Surface Area - Lower Legs	cm^2		455	845	1535	2485	2860	NA [a]	2860	NA	NA	NA	NA
Skin Surface Area - Soil Exposure	cm^2	ESSA	1105 [b]	1745 [b]	2822 [b]	3858 [b]	4343 [b]	NA [a]	4343 [b]	3400 [c]	3400 [c]	3400 [c]	3090 [c]
Frequency of Events - Groundwater Contact	events/day	FE_{GW}	NA	NA	NA	NA	NA	NA	NA	NA	1 [d]	1 [d]	1 [d]
Exposure Duration - Dermal contact with groundwater	hr/event	EDDermWat	NA	NA	NA	NA	NA	NA	NA	NA	0.0833 [e]	0.0833 [e]	0.0833 [e]
Thickness of Stratum Corneum	cm	Isc	NA	NA	NA	NA	NA	NA	NA	NA	1.00E-03	1.00E-03	1.00E-03
Skin Surface Area - Groundwater Exposure	cm^2	$ESSA_w$	NA	NA	NA	NA	NA	NA	NA	NA	890 [f]	890 [f]	820 [f]

Notes:

a. Not applicable. Composite receptor is a sum of the individual receptor ages.

b. Value represents a time-weighted average of exposed skin surface area, as outlined in the Rationale Document (MOECC, 2011).

c. Value represents the sum of head, hands, and forearms, as outlined in the Rationale Document (MOECC, 2011).

d. It is assumed that the construction and utility worker are exposed to groundwater one time per day. Limited exposure is assumed to occur during the handling of hoses used to dewater excavations.

e. It is assumed that the construction and utility worker are exposed to groundwater for 5 minutes per event. Exposure is assumed to occur during the handling of hoses used to dewater excavations.

f. Hands only for GW exposure. Typical construction/utility worker activities do not lead to extensive skin wetting. It is expected that their hands could become wet while handling hoses used to dewater excavations.

g. A value of 0.07 $mg/cm^2/day$ is applied for a Female Indoor Worker and a value of 0.2 $mg/cm^2/day$ is applied for the Female Outdoor and Construction/Utility Workers.

All values outlined are taken from *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario* , Ontario Ministry of the Environment and Climate Change, April 15, 2011 (MOECC, 2011) .

Values not referenced in the Rationale Document (MOECC, 2011) or those requiring additional information are identified above where relevant.

cm - centimetre

cm^2 - centimetre squared

event/day - number of events per day

GW - groundwater

hr/event - duration of event

$mg/cm^2/day$ - milligram(s) per centimetre squared per day

mo - month(s)

MOECC - Ontario Ministry of the Environment and Climate Change

NA - not available

y - year(s)

Table 11-3. Ingestion Exposure Assumptions

Port Lands, Toronto, ON

Parameter	Units	Symbol	Infant Resident (0 - 5 mo.)	Toddler Resident (6 mo. - 4 y)	Child Resident (5 - 11 y)	Teen Resident (12 - 19 y)	Adult Resident (20+ y)	Composite Resident	Indoor Worker (Long Term)	Outdoor Worker (Long Term)	Utility Worker	Construction Worker	Female Adult Worker
Rate of Soil Ingestion	mg-soil/day	SIR	30	200	50	50	50	NA [a]	50	100	100	100	50/100 [b]
Rate of Incidental Groundwater Ingestion [c]	L/event	IR_W	NA	NA	NA	NA	NA	NA	NA	NA	0.05 [d]	0.05 [d]	NA/0.05 [e]

Notes:

a. Not applicable. Composite receptor is a sum of the individual receptor ages.

b. A value of 50 mg-soil/day is applied for a Female Indoor Worker and a value of 100 mg-soil/day is applied for the Female Outdoor and Construction/Utility Workers.

c. Refers to incidental ingestion of groundwater while completing site work that extends to the water table. Groundwater is non-potable

d. Value obtained from USEPA (1989); estimated intake of water while swimming. This value is conservative for construction worker and utility worker incidental ingestion exposure to groundwater.

e. The Female Indoor Worker is assumed to have no direct contact exposure to groundwater. A value of 0.05 L/event is applied for the Female Construction/Utility Worker.

All values outlined are taken from *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario* , Ontario Ministry of the Environment and Climate Change, April 15, 2011 (MOECC, 2011).

Values not referenced in the Rationale Document (MOECC, 2011) or those requiring additional information are identified above where relevant.

L/event - Litres per event
mg-soil/day - milligrams soil per day
mo - month(s)
MOECC - Ontario Ministry of the Environment and Climate Change
NA - not available
USEPA - United States Environmental Protection Agency
y - year(s)

Table 11-4. Dust Inhalation Exposure Assumptions

Port Lands, Toronto, ON

Parameter	Units	Symbol	Infant Resident (0 - 5 mo.)	Toddler Resident (6 mo. - 4 y)	Child Resident (5 - 11 y)	Teen Resident (12 - 19 y)	Adult Resident (20+ y)	Composite Resident	Indoor Worker (Long Term)	Outdoor Worker (Long Term)	Utility Worker	Construction Worker	Female Adult Worker
Concentration of PM_{10} in Air	$\mu g_{soil}/m^3$	PM_{10}	0.76 [a]	0.76 [a]	0.76 [a]	0.76 [a]	0.76 [a]	NA [b]	0.76 [a]	0.76 [a] / 100 [e]	100	100	0.76 [a] / 100 [e]
FPMinh: Fraction of PM_{10} which is deposited	unitless	FPMinh	0.6	0.6	0.6	0.6	0.6	NA [b]	0.6	0.6	0.6	0.6	0.6
IRw: Inhalation rate during exposure period	m^3/hour	IR_A	0.092 [c]	0.346 [c]	0.604 [c]	0.65 [c]	0.692 [c]	NA [b]	0.692 [c]	1.5 [d]	1.5 [d]	1.5	0.658 [f] / 1.5 [d]

Notes:

a. Based on average airborne concentration of respirable particulate matter presented in Health Canada (2010). This value is also applied for the Female Indoor Worker.

b. Not applicable. Composite receptor is a sum of the individual receptor ages.

c. Health Canada (2010); daily rate was divided by 24 hours for hourly rate.

d. Assumed, but consistent with MOECC for Construction Worker scenario.

e. Value of 0.76 $\mu g/m^3$ is based on the average airborne concentration of respirable particulate matter presented in Health Canada (2010); this value is applied to represent average dust levels at the site for the Outdoor Worker, including the Female Outdoor Worker.
Value of 100 is applied to represent higher PM_{10} levels that could be present at the Site for the Outdoor Worker during spring and fall planting; this value is consistent with a subsurface worker, as presented in the Rationale Document (MOECC, 2011) and is also applied for the Female Outdoor Worker during spring and fall planting, and the Female Construction/Utility Worker.

f. Health Canada (2010); daily rate was divided by 24 hours for hourly rate.

All values outlined are taken from *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated Sites in Ontario* , Ontario Ministry of the Environment and Climate Change, April 15, 2011 (MOECC, 2011).

Values not referenced in the Rationale Document (MOECC, 2011) or those requiring additional information are identified above where relevant.

$\mu g/m^3$ - micrograms per cubic metre
$\mu g_{soil}/m^3$ - micrograms soil per cubic metre
m^3/hour - cubic metres per hour
mo - month(s)
MOECC - Ontario Ministry of the Environment and Climate Change
NA - not available
PM_{10} - particulate matter less than 10 micrometres in diameter
y - year(s)

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
2-Chlorovinyl ethyl ether	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Acenaphthene	RfD	6.0E-02	mg/kg/day	Hepatotoxicity.	Mice	MOE, 2011	USEPA IRIS, 1994	No
	RfD Sub-chronic	6.0E-01	mg/kg/day	Increased liver weight.	Mice	MOE, 2011	ATSDR, 1995	No
	SF	7.3E-03	1/[mg/kg/day]	Forestomach, squamous cell papillomas and carcinomas; forestomach, larynx and esophagus, papillomas and carcinomas (combined). Kalberlah et al. TEF (0.001) employed, see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1992	No
	URF	1.1E-03	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.001) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 1995	No
Acenaphthylene	RfD	6.0E-02	mg/kg/day	Hepatotoxicity (surrogate values from acenaphthene). [f]	Mice	MOE, 2011	USEPA IRIS, 1994	No
	RfD Sub-chronic	6.0E-01	mg/kg/day	Increased liver weight (surrogate value from acenaphthene). [f]	Mice	MOE, 2011	ATSDR, 1995	No
	SF	7.3E-02	1/[mg/kg/day]	Forestomach, squamous cell papillomas and carcinomas; forestomach, larynx and esophagus, papillomas and carcinomas (combined). Kalberlah et al. TEF (0.01) employed, see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1992	No
	URF	1.1E-02	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.01) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 1995	No
Acetone	RfD	9.0E-01	mg/kg/day	Nephropathy.	Rats	MOE, 2011	USEPA IRIS, 2003	No
	RfD Sub-chronic	3.0E+00	mg/kg/day	Nephropathy.	Rats	MOE, 2011	USEPA IRIS, 2003 (modified) [b]	No
	RfC	1.2E+01	mg/m^3	Irritation (nose and throat) and neurological effects.	Humans	MOE, 2011	MOE AAQC, 2005	No
Ammonia	RfC	1.0E-01	mg/m^3	Lack of evidence of pulmonary effects	Humans	USEPA RSL, 2013	USEPA IRIS, 1991	Yes
Anthracene	RfD	3.0E-01	mg/kg/day	No observed effects.	Mice	MOE, 2011	USEPA IRIS, 1993	No
	RfD Sub-chronic	3.0E+00	mg/kg/day	No observed effects.	Mice	MOE, 2011	USEPA IRIS, 1993 (modified) [b]	No
	RfC	5.0E-02	mg/m^3	Body weight reduction, hepatic, renal, and developmental effects (surrogate value from C9 - C18 Aromatic Fraction). [f, g]	Rats	MADEP, 2004	TPHCWG, 1997	Yes
Antimony (Sb)	RfD	6.0E-03	mg/kg/day	Decreased body weight and food intake.	Rats	Revised MOE, 2011 [a]	WHO DW, 2003; RIVM, 2009	Yes
	RfC	2.0E-04	mg/m^3	Antimony trioxide-Pulmonary toxicity, and chronic interstitial inflammation.	Rats	MOE, 2011	USEPA IRIS, 1995	No
Arsenic (As)	RfD	3.0E-04	mg/kg/day	Hyperpigmentation, keratosis, and possible vascular complications.	Humans	MOE, 2011	USEPA IRIS, 1993; ATSDR, 2007	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	9.5E+00	1/[mg/kg/day]	Lung and bladder cancers.	Humans	CalEPA DW, 2004	-	Yes
	URF	1.5E-01	$1/[mg/m^3]$	Lung cancer.	Humans	TCEQ, 2012	-	Yes
Barium	RfD	2.0E-01	mg/kg/day	Nephropathy.	Mice	MOE, 2011	USEPA IRIS, 2005; ATSDR, 2007	No
	RfC	1.0E-03	mg/m^3	No observed adverse effects concentration.	Rats	MOE, 2011	RIVM, 2001	No
Benz[a]anthracene [c]	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E-01	1/[mg/kg/day]	Forestomach, squamous cell papillomas and carcinomas; forestomach, larynx and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (0.1) employed, see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1994	No
	URF	1.1E-01	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.1) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Benzene	RfD	4.0E-03	mg/kg/day	Decreased lymphocyte count.	Humans	MOE, 2011	USEPA IRIS, 2003	No
	RfC	3.0E-02	mg/m^3	Decreased lymphocyte count.	Humans	MOE, 2011	USEPA IRIS, 2003	No
	SF	8.5E-02	1/[mg/kg/day]	Effects noted in the blood-forming organs and bone marrow including malignant lymphoma.	Humans, Mice	MOE, 2011	HC DW, 2005	No
	URF	2.2E-03	$1/[mg/m^3]$	Leukemia.	Humans	MOE, 2011	USEPA IRIS, 2000	No
Benzo[a]pyrene [c]	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E+00	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (1) employed.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1994	No
	URF	1.1E+00	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (1) employed.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Benzo[b]fluoranthene [c]	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E-01	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx, and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (0.1) employed; see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1994	No
	URF	1.1E-01	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.1) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Benzo[g,h,i]perylene [c]	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E-02	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx, and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (0.01) employed; see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	-	No
	URF	1.1E-02	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.01) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	-	No
Benzo[k]fluoranthene [c]	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E-01	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (0.1) employed; see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1994	No
	URF	1.1E-01	$1/[mg/m^3]$	Respiratory tract tumour incidence. See Benzo[a]pyrene. Kalberlah et al. TEF (0.1) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Beryllium [d]	RfD	2.0E-03	mg/kg/day	Small intestinal lesions.	Dogs	MOE, 2011	USEPA IRIS, 1998	No
	RfC	7.0E-06	mg/m^3	Beryllium sensitization and chronic beryllium disease (occupational exposure).	Humans	MOE, 2011	CalEPA ChREL, 2001	No
	URF	2.4E+00	$1/[mg/m^3]$	Lung cancer.	Humans	MOE, 2011	USEPA IRIS, 1998	No
1,1-Biphenyl	RfD	3.8E-02	mg/kg/day	Alterations in haematological parameters (that is, decreased haemoglobin concentration and haematocrit).	Rats	MOE, 2011	WHO CICAD, 1999	No
	RfC	4.0E-04	mg/m^3	Congestion and edema of the liver and kidneys	Mice	USEPA RSL, 2013	USEPA PPRTV, 2011	Yes
Bis[2-chloroethyl]ether	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	2.5E+00	1/[mg/kg/day]	Development of hepatomas.	Rats	MOE, 2011	CalEPA ATH, 2005; 2009; 2011	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Bis[2-chloroisopropyl]ether	RfD	4.0E-02	mg/kg/day	Decreased hemoglobin; erythrocyte destruction	Mice	MOE, 2011	USEPA IRIS, 1990	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
Bismuth	RfD	4.0E-04	mg/kg/day	Antimony was used as the surrogate - Longevity, blood glucose, and cholesterol. [f]	Rats	MOE, 2011	USEPA IRIS, 1991	No
	RfC	2.0E-04	mg/m^3	Antimony was used as a surrogate - Antimony trioxide-Pulmonary toxicity, and chronic interstitial inflammation. [f]	Rats	MOE, 2011	USEPA IRIS, 1995	No
Boron [e]	RfD	2.0E-01	mg/kg/day	Decreased fetal weight. [g]	Rats	MOE, 2011	USEPA IRIS, 2004	No
	RfC	2.0E-02	mg/m^3	Respiratory effects.	Mice	USEPA RSL, 2013	USEPA HEAST, 1997	Yes
Bromide	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Bromodichloromethane	RfD	2.0E-02	mg/kg/day	Renal cytomegaly.	Mice, Rats	MOE, 2011	USEPA IRIS, 1991	No
	RfC	7.0E-02	mg/m^3	MADEP derived these values from RfD, (Renal cytomegaly).	-	MADEP, 2004	-	Yes
	SF	6.2E-02	1/[mg/kg/day]	Kidney (tubular cell adenoma and tubular cell adenocarcinoma).	Mice	MOE, 2011	USEPA IRIS, 1993	No
	URF	3.7E-02	$1/[mg/m^3]$	Kidney cancer.	Mice, Rats	USEPA RSL, 2013	CalEPA OEHHA, 2009	Yes
Bromoform	RfD	2.0E-02	mg/kg/day	Hepatic lesions.	Mice, Rats	MOE, 2011	USEPA IRIS, 1991	No
	RfD Sub-chronic	3.0E-02	mg/kg/day	Hepatocellular vacuolization	Rats	MOE, 2011	USEPA PPRTV, 2005	No
	RfC	7.0E-02	mg/m^3	Hepatic lesions. MADEP derived these values from RfD.	Rats	MADEP, 2004	USEPA IRIS, 2003	Yes
	SF	7.9E-03	1/[mg/kg/day]	Neoplastic lesions in the large intestine.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	URF	1.1E-03	$1/[mg/m^3]$	Neoplastic lesions in the large intestine.	Rats	MOE, 2011	USEPA IRIS, 1991	No

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Bromomethane	RfD	3.0E-04	mg/kg/day	Irritation and hyperplasia of the epithelium in the forestomach.	Rats	MOE, 2011	ATSDR, 1992 (modified) [b]	No
	RfD Sub-chronic	3.0E-03	mg/kg/day	Irritation and hyperplasia of the epithelium in the forestomach.	Rats	MOE, 2011	ATSDR, 1992	No
	RfC	5.0E-03	mg/m^3	Degenerative and proliferative lesions of the olfactory epithelium of the nasal cavity.	Rats	MOE, 2011	USEPA IRIS, 1992	No
Cadmium	RfD	1.0E-04	mg/kg/day	Renal toxicity.	Humans	ATSDR, 2012	-	Yes
	RfC	1.0E-05	mg/m^3	Kidney toxicity.	Humans	USEPA RSL, 2012	ATSDR, 2012	Yes
	SF	NA	1/[mg/kg/day]	-	-	-	-	No
	URF	9.8E+00	$1/[mg/m^3]$	Lung carcinomas.	Rats	MOE, 2011	HC, 1996; HC CSD, 2010	No
Calcium [e]	DRI/UL (dose)	3.6E+01	mg/kg/day	Nutritionally essential element (see Section 4.4.3).	Humans	USDA, 2010	NAS, 2010	Yes
Carbon Tetrachloride	RfD	4.0E-03	mg/kg/day	Elevated serum sorbitol dehydrogenase (SDH) activity.	Rats	USEPA IRIS, 2010	-	Yes
	RfD Sub-chronic	1.3E-02	mg/kg/day	Elevated serum sorbitol dehydrogenase (SDH) activity.	Rats	USEPA IRIS, 2010	-	Yes
	RfC	1.0E-01	mg/m^3	Fatty changes in the liver.	Rats	USEPA IRIS, 2010	-	Yes
	SF	7.0E-02	1/[mg/kg/day]	Hepatocellular adenoma or carcinoma.	Mice	USEPA IRIS, 2010	-	Yes
	URF	6.0E-03	$1/[mg/m^3]$	Pheochromocytoma.	Mice	USEPA IRIS, 2010	-	Yes
Chloride	RfD	5.1E+01	mg/kg/day	Nutritionally essential element (see Table 4-X)9	Humans	USDA, 2010	NAS, 2010	No
	RfC	NA	mg/m^3	Nutritionally essential element.	-	-	-	No
Chloroaniline, 4-	RfD	2.0E-03	mg/kg/day	Increased methaemoglobin in rats and mice and fibrotic changes in spleen of male rats	Mice, Rats	MOE, 2011	WHO CICAD, 2003	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
Chlorobenzene	RfD	6.0E-02	mg/kg/day	Altered serum enzyme chemistry and histopathological changes in the liver.	Dogs	MOE, 2011	CalEPA DW, 2003	No
	RfD Sub-chronic	1.9E-01	mg/kg/day	Altered serum enzyme chemistry and histopathological changes in the liver.	Dogs	MOE, 2011	CalEPA DW, 2003	No
	RfC	1.0E+00	mg/m^3	Increased liver weights, hepatocellular hypertrophy, renal degeneration and inflammation, and testicular degeneration.	Rats	MOE, 2011	CalEPA ChREL, 2000	No
Chloroethane	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Chloroform	RfD	1.0E-02	mg/kg/day	Moderate/marked fatty cyst formation in the liver and elevated SGPT.	Dogs	MOE, 2011	USEPA IRIS, 2001	No
	RfD Sub-chronic	1.0E-01	mg/kg/day	Significantly increased SGPT activity.	Dogs	MOE, 2011	ATSDR, 1997	No
	RfC	9.8E-02	mg/m^3	Hepatomegaly and other liver effects.	Humans	MOE, 2011	ATSDR, 1997	No
	SF	3.1E-02	1/[mg/kg/day]	Kidney tumours.	Mice, Rats	MOE, 2011	CalEPA ARB, 1990	No
	URF	5.3E-03	$1/[mg/m^3]$	Kidney tumours.	Mice, Rats	MOE, 2011	CalEPA ATH, 2005; 2009; 2011	No
Chloromethane	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Chromium (total)	RfD	1.5E+00	mg/kg/day	No effects observed.	Rats	MOE, 2011	USEPA IRIS, 1998	No
	RfC	6.0E-02	mg/m^3	No effects observed.	Humans	MOE, 2011	RIVM, 2001	No
Chrysene	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E-02	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (1) employed; see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1994	No
	URF	1.1E-02	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.01) employed; see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Cobalt (Co)	RfD	1.0E-03	mg/kg/day	Polycythemia (proportion of blood volume that is occupied by red blood cells increased).	Humans	MOE, 2011	ATSDR, 2004	No
	RfD Sub-chronic	1.0E-02	mg/kg/day	Polycythemia (proportion of blood volume that is occupied by red blood cells increased).	Humans	MOE, 2011	ATSDR, 2004	No
	RfC	5.0E-04	mg/m^3	Interstitial lung disease.	Humans	MOE, 2011	RIVM, 2001	No

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Copper (Cu)	RfD	3.0E-02	mg/kg/day	Gastrointestinal effects.	Humans	MOE, 2011	HC DW, 1992	No
	RfD Sub-chronic	1.0E-02	mg/kg/day	Gastrointestinal effects.	Humans	ATSDR, 2004	-	Yes
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
Cyanide (CN-)	RfD	2.0E-02	mg/kg/day	Weight loss, thyroid effects, and myelin degeneration.	Rats	MOE, 2011	USEPA IRIS, 1993	No
	RfD Sub-chronic	5.0E-02	mg/kg/day	Reductions in the number of spermatid heads and sperm counts.	Rats	MOE, 2011	ATSDR, 2006	No
	RfC	8.0E-03	mg/m^3	CNS and thyroid effects.	Humans	MOE, 2011	MOE AAQC, 2012	No
Dibenz[a,h]anthracene [c]	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.3E+00	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (1) employed; see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1994	No
	URF	1.1E+00	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (1) employed.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Dibromochloromethane	RfD	2.0E-02	mg/kg/day	Hepatic lesions.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	RfD Sub-chronic	2.0E-01	mg/kg/day	Hepatic lesions.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	RfC	7.0E-02	mg/m^3	MADEP derived these values from RfD, (hepatic lesions).	-	MADEP, 2004	-	Yes
	SF	8.4E-02	1/[mg/kg/day]	Hepatocellular adenoma or carcinoma.	Mice	MOE, 2011	USEPA IRIS, 1992	No
Dichlorobenzene, 1,2-	RfD	3.0E-01	mg/kg/day	Significantly increased incidence of renal tubular regeneration.	Mice	MOE, 2011	ATSDR, 2006	No
	RfD Sub-chronic	6.0E-01	mg/kg/day	Increased relative liver weight.	Rats	MOE, 2011	ATSDR, 2006	No
	RfC	6.0E-01	mg/m^3	Decreased spleen weights.	Guinea Pigs	MOE, 2011	RIVM, 2001	No
Dichlorobenzene, 1,3-	RfD	2.0E-02	mg/kg/day	Pituitary lesions - cytoplasmic vacuolation in the pars distalis.	Rats	MOE, 2011	ATSDR, 2006	No
	RfD Sub-chronic	2.0E-02	mg/kg/day	Pituitary lesions - cytoplasmic vacuolation in the pars distalis.	Rats	MOE, 2011	ATSDR, 2006	No
	RfC	2.0E-01	mg/m^3	RfC value for 1,2-dichlorobenzene (USEPA, 1997) used as a proxy. LOAEL based on decreased body weight gain in rats and decreased spleen weight in guinea pigs.	Guinea Pigs, Rats	MADEP, 2004	-	Yes
Dichlorobenzene, 1,4-	RfD	3.0E-02	mg/kg/day	Diffuse hepatocellular hypertrophy.	Dogs	MOE, 2011	USEPA IRIS, 2006	No
	RfD Sub-chronic	7.0E-02	mg/kg/day	Changes in serum alkaline phosphatase levels.	Dogs	MOE, 2011	ATSDR, 2006	No
	RfC	6.0E-02	mg/m^3	Nasal lesions - moderate or severe eosinophilic changes in the nasal olfactory epithelium.	Rats	MOE, 2011	ATSDR, 2006	No
	SF	1.7E-02	1/[mg/kg/day]	Hepatocellular adenoma or carcinoma.	Mice	MOE, 2011	USEPA IRIS, 2006	No
	URF	4.0E-03	$1/[mg/m^3]$	Hepatocellular tumours.	Mice	MOE, 2011	USEPA IRIS, 2006	No
Dichlorobenzidine, 3,3-	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	1.2E+00	1/[mg/kg/day]	Mammary adenocarcinoma.	Dogs, Rats	MOE, 2011	CalEPA ATH, 2005; 2009; 2011	No
	URF	3.4E-01	$1/[mg/m^3]$	Mammary adenocarcinoma	-	USEPA RSL, 2013	CalEPA ATH, 2005; 2009; 2011	Yes
Dichloroethane, 1,1-	RfD	4.0E-02	mg/kg/day	Kidney damage (for example, increased serum creatinine and urea).	Cats	MOE, 2011	CalEPA DW, 2003	No
	RfD Sub-chronic	4.0E-01	mg/kg/day	Kidney damage (for example, increased serum creatinine and urea).	Cats	MOE, 2011	CalEPA DW, 2003	No
	RfC	1.7E-01	mg/m^3	Kidney damage (for example, increased serum creatinine and urea).	Cats	MOE, 2011	USEPA HEAST, 1984	No
	SF	5.7E-03	1/[mg/kg/day]	Mammary gland adenocarcinomas.	Rats	CalEPA DW, 2003	-	Yes
	URF	1.6E-03	$1/[mg/m^3]$	Mammary gland adenocarcinomas.	Rats	USEPA RSL, 2013	CalEPA DW, 2003	Yes
Dichloroethane, 1,2-	RfD	2.0E-02	mg/kg/day	Increased absolute and relative kidney weights in rats.	Rats	MOE, 2011	ATSDR, 2001	No
	RfD Sub-chronic	2.0E-01	mg/kg/day	Increased absolute and relative kidney weights in rats.	Rats	MOE, 2011	ATSDR, 2001	No
	RfC	4.0E-01	mg/m^3	Hepatotoxicity; elevated liver enzyme levels in serum.	Rats	MOE, 2011	CalEPA ChREL, 2000	No
	SF	9.1E-02	1/[mg/kg/day]	Hemangiosarcomas.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	URF	2.6E-02	$1/[mg/m^3]$	Hemangiosarcomas.	Rats	MOE, 2011	USEPA IRIS, 1991	No
Dichloroethylene, 1,1-	RfD	5.0E-02	mg/kg/day	Liver toxicity (fatty change).	Rats	MOE, 2011	USEPA IRIS, 2002	No
	RfC	7.0E-02	mg/m^3	Increased mortality, and hepatic effects (mottled livers and increases in liver enzymes).	Guinea Pigs	MOE, 2011	CalEPA ChREL, 2000	No
	RfC Sub-chronic	8.0E-02	mg/m^3	Hepatic effects (mottled livers).	Guinea Pigs	ATSDR, 1994	-	Yes
Dichloroethylene, cis-1,2-	RfD	2.0E-03	mg/kg/day	Increased kidney and liver weights; decrease hematocrit.	Rats	USEPA IRIS, 2010	-	Yes
	RfD Sub-chronic	3.0E-01	mg/kg/day	Decreased hematocrit.	Rats	MOE, 2011	ATSDR, 1996; RIVM, 2001 (modified) [b]	No
	RfC	1.5E-01	mg/m^3	Decreased body weight, hematocrit, and hemoglobin.	Rats	MOE, 2011	RIVM, 2001 (modified) [b]	Yes

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Dichloroethylene, trans-1,2-	RfD	2.0E-02	mg/kg/day	Increased serum alkaline phosphatase.	Mice	MOE, 2011	USEPA IRIS, 1989	No
	RfD Sub-chronic	2.0E-01	mg/kg/day	Increased serum alkaline phosphatase and relative liver weights.	Mice	MOE, 2011	ATSDR, 1996; USEPA IRIS, 1989 (modified) [b]	No
	RfC	6.0E-02	mg/m^3	Fatty degeneration of the liver lobules and Kupffer cells, and pulmonary hyperaemia, alveolar septal distension, and pneumonic infiltration.	Rats	MOE, 2011	RIVM, 2001	No
Dichloropropane, 1,2-	RfD	9.0E-02	mg/kg/day	Hepatic effects.	Mice	MOE, 2011	ATSDR, 1989; CalEPA DW, 1999	No
	RfC	4.0E-03	mg/m^3	Hyperplasia of the nasal mucosa.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	SF	3.6E-02	1/[mg/kg/day]	Increased incidence of hepatocellular adenomas and carcinomas.	Mice	MOE, 2011	CalEPA DW, 1999	No
	URF	1.0E-02	$1/[mg/m^3]$	Calculated by CalEPA from oral SF.	Mice	USEPA RSL, 2013	CalEPA DW, 2002	Yes
Dichloropropene, 1,3-	RfD	3.0E-02	mg/kg/day	Chronic irritation.	Rats	MOE, 2011	USEPA IRIS, 2000	No
	RfD Sub-chronic	4.0E-02	mg/kg/day	Basal cell hyperplasia of the nonglandular stomach.	Rats	MOE, 2011	ATSDR, 2008	No
	RfC	2.0E-02	mg/m^3	Hypertrophy/ hyperplasia of the nasal respiratory epithelium.	Mice	MOE, 2011	USEPA IRIS, 2000	No
	SF	9.1E-02	1/[mg/kg/day]	Urinary bladder, forestomach, lung and live carcinomas and neoplasms.	Mice, Rats	MOE, 2011	CalEPA DW, 1999	No
	URF	4.0E-03	$1/[mg/m^3]$	Bronchioalveolar adenoma.	Mice	MOE, 2011	USEPA IRIS, 2000	No
Diethyl phthalate	RfD	5.0E+00	mg/kg/day	Lethargy, prostration, and ataxia) and hematological changes (surrogate - 2,4-Dimethylphenol). [f]	-	MOE, 2011	WHO CICAD, 2003	No
	RfD Sub-chronic	8.0E+00	mg/kg/day	Lethargy, prostration, and ataxia) and hematological changes (surrogate - 2,4-Dimethylphenol). [f]	-	MOE, 2011	USEPA IRIS, 1993 (modified) [b]	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	(blank)
Dimethyl phthalate	RfD	5.0E+00	mg/kg/day	Body weight	Rats	MOE, 2011	WHO CICAD, 2003	No
Dinitrotoluene, 2,4- & 2,6-	RfD	2.0E-03	mg/kg/day	Neurotoxicity, hematological, and biliary effects.	Dogs	MOE, 2011	USEPA IRIS, 1993; ATSDR, 1998	No
	RfD Sub-chronic	4.0E-03	mg/kg/day	Hematological, neurological, reproductive, and hepatic toxicity, with histopathological changes of the spleen.	Dogs, Mice, Rats	MOE, 2011	ATSDR, 1998	No
	SF	6.8E-01	1/[mg/kg/day]	Liver and mammary gland toxicity.	Rats	MOE, 2011	USEPA IRIS, 1990	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Ethylbenzene	RfD	1.0E-01	mg/kg/day	Liver and kidney toxicity.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	RfC	1.0E+00	mg/m^3	Developmental toxicity. [g]	Rabbits, Rats	MOE, 2011	USEPA IRIS, 1991	No
	SF	1.1E-02	1/[mg/kg/day]	Renal tubular carcinoma and adenoma.	Rats	CalEPA ATH, 2007	-	Yes
	URF	2.5E-03	$1/[mg/m^3]$	Renal tubular carcinoma and adenoma.	Rats	USEPA RSL, 2013	CalEPA ATH, 2005; 2009; 2011	Yes
Ethylene Dibromide	RfD	9.0E-03	mg/kg/day	Testicular atrophy, liver peliosis, and adrenal cortical degeneration.	Rats	MOE, 2011	USEPA IRIS, 2004	No
	RfD Sub-chronic	2.5E-02	mg/kg/day	Increased relative liver and kidney weights, and reversible epithelial hyperplasia and squamous metaplasia of the nasal turbinates.	Rats	MOE, 2011	CalEPA DW, 2003	No
	RfC	8.0E-04	mg/m^3	Decreased sperm count/ejaculate, decreased percentage of viable and motile sperm, increased semen pH, and increased proportion of sperm with specific morphological abnormalities.	Humans	MOE, 2011	CalEPA ChREL, 2001	No
	SF	3.6E+00	1/[mg/kg/day]	Stomach squamous cell carcinoma.	Mice, Rats	MOE, 2011	CalEPA DW, 2003	No
	URF	6.0E-01	$1/[mg/m^3]$	Nasal cavity (includes adenoma, adenocarcinoma, papillary adenoma, squamous cell carcinoma, and or/papilloma), hemangiosarcomas, mesotheliomas.	Rats	MOE, 2011	USEPA IRIS, 2004	No
Fluoranthene	RfD	4.0E-02	mg/kg/day	Nephropathy, increased liver weights, hematological alterations, and clinical effects.	Mice	MOE, 2011	USEPA IRIS, 1993	No
	RfD Sub-chronic	4.0E-01	mg/kg/day	Nephropathy, increased liver weights, hematological alterations, and clinical effects.	Mice	MOE, 2011	USEPA IRIS, 1993 (modified) [b]	No
	SF	7.3E-02	1/[mg/kg/day]	Forestomach, squamous cell papillomas and carcinomas; forestomach, larynx and esophagus, papillomas and carcinomas (combined). Kalberlah et al. TEF (0.01) employed, see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1992	No
	URF	1.1E-02	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.01) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Fluorene	RfD	4.0E-02	mg/kg/day	Decreased red blood cell count, packed cell volume and hemoglobin.	Mice	MOE, 2011	USEPA IRIS, 1990	No
	RfD Sub-chronic	4.0E-01	mg/kg/day	Decreased red blood cell count, packed cell volume and hemoglobin.	Mice	MOE, 2011	USEPA IRIS, 1990 (modified) [b]	No
	RfC	5.0E-02	mg/m^3	CNS effects and increased liver and kidney weight.	Rats	MADEP, 2004	-	Yes
Hexachlorobenzene	RfD	7.0E-05	mg/kg/day	Liver effects.	Rats	Revised MOE, 2011 [a]	ATSDR, 2013	Yes
	RfD Sub-chronic	1.0E-04	mg/kg/day	Ovarian effects. [g]	Monkeys	MOE, 2011	ATSDR, 2002; 2013	No
	SF	1.2E+00	1/[mg/kg/day]	Adrenal pheochromocytomas.	Rats	MOE, 2011	CalEPA DW, 2003	No

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Hexachlorobutadiene [e]	RfD	3.4E-04	mg/kg/day	Kidney toxicity.	Mice	MOE, 2011	HC PSL2, 2001	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	7.8E-02	1/[mg/kg/day]	Renal tubular adenomas and adenocarcinomas.	Rats	MOE, 2011	USEPA IRIS, 1991	No
	URF	2.2E-02	$1/[mg/m^3]$	Kidney toxicity.	Rats	MOE, 2011	USEPA IRIS, 1991	No
Hexachloroethane	RfD	7.0E-04	mg/kg/day	Atrophy and degeneration of renal tubules.	Rats	Revised MOE, 2011 [a]	USEPA IRIS, 2011	Yes
	RfD Sub-chronic	1.0E-02	mg/kg/day	Hepatic and renal effects.	Rats	MOE, 2011	ATSDR, 1997	No
	RfC	3.0E-02	mg/m^3	Neurotoxicity.	-	USEPA IRIS, 2011	-	Yes
	SF	4.0E-02	1/[mg/kg/day]	Renal adenomas and carcinomas.	Rats	Revised MOE, 2011 [a]	USEPA IRIS, 2011	Yes
	URF	1.1E-02	$1/[mg/m^3]$	Liver carcinomas	Mice, Rats	USEPA RSL, 2013	CalEPA, 1992	Yes
Hexanone, 2-	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Indeno[1,2,3-cd]pyrene [c]	SF	7.3E-01	1/[mg/kg/day]	Forestomach, squamous cell papillomas, and carcinomas; forestomach, larynx and esophagus; papillomas and carcinomas (combined). Kalberlah et al. TEF (0.1) employed, see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1992	No
	URF	1.1E-01	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.1) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 1995	No
	RfC	2.0E-04	mg/m^3	Neurological effects in children. [g]	-	MOE, 2007	-	Yes
Magnesium [e]	DRI/UL (dose)	5.0E+00	mg/kg/day	Nutritionally essential element (see Section 4.4.3).	Humans	USDA, 2010	NAS, 2010	No
Mercury (elemental)	RfD	3.0E-04	mg/kg/day	Increased kidney weight.	Rats	MOE, 2011	USEPA IRIS, 1995	No
	RfD Sub-chronic	3.0E-03	mg/kg/day	Increased kidney weight.	Rats	MOE, 2011	USEPA IRIS, 1995	No
	RfC	3.0E-04	mg/m^3	Hand tremors - workers and Impairment of neurobehavioral functions.	Humans	USEPA IRIS, 1995	-	Yes
Methyl ethyl ketone	RfD	6.0E-01	mg/kg/day	Decreased pup body weight. [g]	Rats	MOE, 2011	USEPA IRIS, 2003	No
	RfC	5.0E+00	mg/m^3	Developmental toxicity (skeletal variations). [g]	Mice	MOE, 2011	USEPA IRIS, 2003	No
Methyl isobutyl ketone	RfD	8.0E-02	mg/kg/day	Weight gain in whole body, liver and kidney	Rats	USEPA RSL, 2013	USEPA HEAST, 1997	Yes
	RfD Sub-chronic	8.0E-01	mg/kg/day	Weight gain in whole body, liver and kidney	Rats	USEPA HEAST, 1997	-	Yes
	RfC	3.0E+00	mg/m^3	Reduced fetal body weight, skeletal variations, and increased fetal death. [g]	Mice, Rats	MOE, 2011	USEPA IRIS, 2003	No
Methyl t-butyl ether	RfD	3.0E-02	mg/kg/day	Increased relative kidney weight and decreased calcium and glucose.	Rats	MOE, 2011	HC, 1996 (modified) [b]	No
	RfD Sub-chronic	3.0E-01	mg/kg/day	Hepatic effects (decreased blood urea nitrogen levels).	Rats	MOE, 2011	HC, 1996	No
	RfC	3.0E+00	mg/m^3	Increased absolute and relative liver and kidney weights and increased severity of spontaneous renal lesions, increased prostration, and swollen periocular tissue.	Rats	MOE, 2011	USEPA IRIS, 1993	No
	SF	1.8E-03	1/[mg/kg/day]	Kidney adenomas and carcinomas; Leydig cell tumours; and leukemia and lymphomas.	Rats	MOE, 2011	CalEPA DW, 1999; CalEPA ATH, 2005	No
	URF	2.6E-04	$1/[mg/m^3]$	Calculated by CalEPA from SF.	Rats	MOE, 2011	CalEPA DW, 1999; CalEPA ATH, 2005	No
Methylene Chloride	RfD	6.0E-03	mg/kg/day	Liver toxicity (histological alterations).	Rats	USEPA IRIS, 2011	-	Yes
	RfC	6.0E-01	mg/m^3	Hepatic toxicity.	Rats	Revised MOE, 2011 [a]	USEPA, 2011	Yes
	RfC Sub-chronic	1.0E+00	mg/m^3	Hepatic toxicity.	Rats	ATSDR, 2000	-	Yes
	SF	2.0E-03	1/[mg/kg/day]	Hepatocellular adenomas or carcinomas, and neoplastic nodules.	Mice	USEPA IRIS, 2011	-	Yes
	URF	1.0E-05	$1/[mg/m^3]$	Carcinogenic by mutagenic mode of action in early life. Lung and liver tumors.	Mice	USEPA IRIS, 2011	-	Yes
2-(1-)Methylnaphthalene	RfD	4.0E-03	mg/kg/day	Pulmonary alveolar proteinosis.	Mice	MOE, 2011	USEPA IRIS, 2003	No
	RfC	5.0E-02	mg/m^3	CNS effects and increased liver and kidney weight.	Rats	MADEP, 2003	-	Yes
	SF	2.9E-02	1/[mg/kg/day]	Carcinogenic by mutagenic mode of action for lung adenomas and carcinomas. 1-Methylnaphthalene only.	Mice	USEPA PPRTV, 2008	-	Yes
Molybdenum	RfD	5.0E-03	mg/kg/day	Increased uric acid levels.	Humans	MOE, 2011	USEPA IRIS, 1993	No
	RfC	1.2E-02	mg/m^3	Changes in body weight.	Mice, Rats	MOE, 2011	RIVM, 2001	No

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Naphthalene	RfD	2.0E-02	mg/kg/day	Decreased mean terminal body weight.	Rats	MOE, 2011	USEPA IRIS, 1998	No
	RfD Sub-chronic	2.0E-01	mg/kg/day	Decreased mean terminal body weight.	Rats	MOE, 2011	USEPA IRIS, 1998 (modified) [b]	No
	RfC	3.7E-03	mg/m^3	Nasal effects: hyperplasia and metaplasia of respiratory and olfactory epithelium.	Mice	MOE, 2011	ATSDR, 2005	No
	URF	3.4E-02	$1/[mg/m^3]$	Carcinogenicity; respiratory epithelial adenoma and olfactory epithelial neuroblastoma of the nose.	Mice, Rats	USEPA RSL, 2013	CalEPA ATH, 2005; 2009; 2011	Yes
n-Hexane	RfD	6.0E-02	mg/kg/day	Nervous system-neuropathy; Testicular atrophy.	Rats	USEPA RSL, 2013	USEPA HEAST, 1997	Yes
	RfD Sub-chronic	6.0E-01	mg/kg/day	Nervous system-neuropathy; Testicular atrophy.	Rats	USEPA HEAST, 1997	-	Yes
	RfC	7.0E-01	mg/m^3	Neurotoxic effects (functional impairment of the peripheral nervous system).	Rats	USEPA IRIS, 2005	-	Yes
Nickel	RfD	2.0E-02	mg/kg/day	Decreased body and organ weights.	Rats	MOE, 2011	USEPA IRIS, 1992	No
	RfC	6.0E-05	mg/m^3	Lung fibrosis.	Rats	MOE, 2011	TERA, 1999	No
	URF	2.4E-01	$1/[mg/m^3]$	Lung and nasal cancers.	Humans	MOE, 2011	USEPA IRIS, 1991; 2006	No
Nitrate as N	RfD	1.6E+00	mg/kg/day	Cyanosis due to methemoglobinemia.	Humans	USEPA IRIS, 1991	-	Yes
Nitrate-Nitrite (as N)	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
Pentachlorophenol	RfD	1.0E-03	mg/kg/day	Thyroid effects.	Mink	MOE, 2011	ATSDR, 2001	No
	SF	4.0E-01	1/[mg/kg/day]	Hepatocellular adenomas or carcinomas and adrenal benign or malignant pheochromocytomas.	Mice	Revised MOE, 2011 [a]	USEPA IRIS, 2011	Yes
Perchlorate	RfD	NA	mg/kg/day	None Selected.	-	-	-	No
	RfC	NA	mg/m^3	None Selected.	-	-	-	No
	SF	NA	1/[mg/kg/day]	None Selected.	-	-	-	No
	URF	NA	$1/[mg/m^3]$	None Selected.	-	-	-	No
PHC F1 (C6-C10)								
Aliphatic (C6 - C8)	RfD	5.0E+00	mg/kg/day	Neurotoxicity.	Mice, Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	1.8E+01	mg/m^3	Neurotoxicity.	Mice, Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
Aliphatic (C>8 - C10)	RfD	1.0E-01	mg/kg/day	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfD Sub-chronic	1.0E+00	mg/kg/day	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	1.0E+00	mg/m^3	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
Aromatic (C>8 - C10)	RfD	4.0E-02	mg/kg/day	Decreased body weight.	Mice, Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	2.0E-01	mg/m^3	Decreased body weight.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
PHC F2 (C10-C16)								
Aliphatic (C>10 - C12)	RfD	1.0E-01	mg/kg/day	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfD Sub-chronic	1.0E+00	mg/kg/day	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	1.0E+00	mg/m^3	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
Aliphatic (C>12 - C16)	RfD	1.0E-01	mg/kg/day	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfD Sub-chronic	1.0E+00	mg/kg/day	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	1.0E+00	mg/m^3	Hepatic and hematological changes.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
Aromatic (C>10 - C12)	RfD	4.0E-02	mg/kg/day	Decreased body weight.	Mice, Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	2.0E-01	mg/m^3	Decreased body weight.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
Aromatic (C>12 - C16)	RfD	4.0E-02	mg/kg/day	Decreased body weight.	Mice, Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	2.0E-01	mg/m^3	Decreased body weight.	Rats	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
PHC F3 (C16-C34)								
Aliphatic (C>16 - C21) [e]	RfD	2.0E+00	mg/kg/day	Hepatic (foreign body reaction) granuloma.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	NA	mg/m^3	None Selected.	-	-	(blank)	No
Aliphatic (C>21 - C34) [e]	RfD	2.0E+00	mg/kg/day	Hepatic (foreign body reaction) granuloma.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	NA	mg/m^3	None Selected.	-	-	(blank)	No
	RfD Sub-chronic	3.0E-01	mg/kg/day	Nephrotoxcity.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Aromatic (C>16 - C21) [e]	RfD	3.0E-02	mg/kg/day	Nephrotoxcity.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfD Sub-chronic	3.0E-01	mg/kg/day	Nephrotoxcity.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	NA	mg/m^3	None Selected.	-	-	(blank)	No
Aromatic (C>21 - C34) [e]	RfD	3.0E-02	mg/kg/day	Nephrotoxcity.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	NA	mg/m^3	None Selected.	-	-	(blank)	No
PHC F4 (C34-C50)/F4G-SG (GHH-Silica)								
Aliphatic (C>34) [e]	RfD	2.0E+01	mg/kg/day	Hepatic (foreign body reaction) granuloma.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	NA	mg/m^3	None Selected.	-	-	(blank)	No
Aromatic (C>34) [e]	RfD	3.0E-02	mg/kg/day	Nephrotoxcity.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfD Sub-chronic	3.0E-01	mg/kg/day	Nephrotoxcity.	Mice	MOE, 2011	TPHCWG, 1997; CCME, 2000	No
	RfC	NA	mg/m^3	None Selected.	-	-	(blank)	No
Phenanthrene	RfD	4.0E-02	mg/kg/day	Applicable to the non-carcinogenic C9 to C16 aromatic total petroleum hydrocarbon fraction (or its constituents) and is based on decreased body weight and increased liver and kidney weight.	Mice, Rats	RIVM, 2001	-	Yes
	RfC	5.0E-02	mg/m^3	CNS effects and increased liver and kidney weight.	Rats	MADEP, 2004	-	Yes
Polychlorinated Biphenyls	RfD	2.0E-05	mg/kg/day	Immunological effects.	Monkeys	MOE, 2011	ATSDR, 2000	No
	RfD Sub-chronic	3.0E-05	mg/kg/day	Neurobehavioral alterations.	Monkeys	MOE, 2011	ATSDR, 2000	No
	RfC	5.0E-04	mg/m^3	Hepatic effects and reduced body weight.	Rabbits, Rats	MOE, 2011	RIVM, 2001	No
	URF	1.0E-01	$1/[mg/m^3]$	Liver hepatocellular adenomas, carcinomas, cholangiomas, or cholangiocarcinomas.	Rats	MOE, 2011	USEPA IRIS, 1997	No
Pyrene	RfD	3.0E-02	mg/kg/day	Kidney effects (renal tubular pathology, decreased kidney weights).	Mice	MOE, 2011	USEPA IRIS, 1993	No
	RfD Sub-chronic	3.0E-01	mg/kg/day	Kidney effects (renal tubular pathology, decreased kidney weights).	Mice	MOE, 2011	USEPA IRIS, 1993	No
	SF	7.3E-03	1/[mg/kg/day]	Forestomach, squamous cell papillomas and carcinomas; forestomach, larynx and esophagus, papillomas and carcinomas (combined). Kalberlah et al. TEF (0.001) employed, see Benzo[a]pyrene.	Mice, Rats	MOE, 2011	Kalberlah et. al., 1995; USEPA IRIS, 1992	No
	URF	1.1E-03	$1/[mg/m^3]$	Respiratory tract tumour incidence. Kalberlah et al. TEF (0.01) employed, see Benzo[a]pyrene.	Hamsters	MOE, 2011	Kalberlah et. al., 1995; CalEPA ATH, 1993; 2005	No
Selenium (Se)	RfD	5.0E-03	mg/kg/day	Clinical selenosis.	Humans	MOE, 2011	USEPA IRIS, 1991	No
	RfC	2.0E-02	mg/m^3	Based on oral RfD. Calculated using adult body weight of 70 kg and inhalation rate of 20 m3/day.	Humans	USEPA RSL, 2013	CalEPA ChREL, 2008	Yes
Silver	RfD	5.0E-03	mg/kg/day	Argyria.	Humans	MOE, 2011	USEPA IRIS, 1996	No
	RfC	1.4E-04	mg/m^3	Route-to-route extrapolation by MADEP.	-	MADEP, 2004	-	Yes
Sodium [e]	DRI/UL (dose)	3.3E+01	mg/kg/day	Nutritionally essential element (see Section 4.4.3).	Humans	USDA, 2010	NAS, 2010	No
Strontium	RfD	6.0E-01	mg/kg/day	Rachitic bones, skeletal abnormalities, osteoporosis.	Rats	USEPA IRIS, 1996	-	Yes
	RfD Sub-chronic	2.0E+00	mg/kg/day	Rachitic bones, skeletal abnormalities, and osteoporosis.	Rats	ATSDR, 2004	-	Yes
Styrene	RfD	1.2E-01	mg/kg/day	Body weight effects.	Rats	MOE, 2011	RIVM, 2001; HC PSL1, 1988	No
	RfC	2.6E-01	mg/m^3	Neurological effects.	Humans	MOE, 2011	WHO, 2000 (modified) [b]	No
Tetrachloroethane, 1,1,1,2-	RfD	3.0E-02	mg/kg/day	Kidney mineralization in males; hepatic clear cell change in females.	Rats	MOE, 2011	USEPA IRIS, 1996	No
	SF	2.6E-02	1/[mg/kg/day]	Hepatocellular adenoma or carcinoma.	Mice	MOE, 2011	USEPA IRIS, 1991	No
	URF	7.4E-03	$1/[mg/m^3]$	Hepatocellular adenoma or carcinoma.	Mice	MOE, 2011	USEPA IRIS, 1991	No
Tetrachloroethane, 1,1,2,2-	RfD	2.0E-02	mg/kg/day	Increase in relative liver weight.	Rats	Revised MOE, 2011 [a]	USEPA IRIS, 2010	Yes
	RfD Sub-chronic	5.0E-02	mg/kg/day	Increase in relative liver weight.	Rats	Revised MOE, 2011 [a]	USEPA IRIS, 2010	Yes
	SF	2.0E-01	1/[mg/kg/day]	Hepatocellular carcinoma.	Mice	MOE, 2011	USEPA IRIS, 1994	No
	URF	5.8E-02	$1/[mg/m^3]$	Hepatocellular carcinoma.	Mice	MOE, 2011	CalEPA ATH, 2005; 2009; 2011	No
Tetrachloroethylene	RfD	6.0E-03	mg/kg/day	Neurotoxicity - occupational exposures.	Humans	USEPA IRIS, 2012	-	Yes
	RfD Sub-chronic	1.4E-01	mg/kg/day	Effects on body weight gain, and ratio of liver or kidney weight to body weight.	Rats	MOE, 2011	HC, 1996 (modified) [b]; WHO DW, 2003	No
	RfC	4.0E-02	mg/m^3	Neurotoxicity - occupational exposures.	Humans	USEPA IRIS, 2012	-	Yes
	SF	2.0E-03	1/[mg/kg/day]	Hepatocellular adenomas or carcinomas.	Mice	USEPA IRIS, 2012	-	Yes
	URF	2.6E-04	$1/[mg/m^3]$	Hepatocellular adenomas or carcinomas.	Mice	USEPA IRIS, 2012	-	Yes

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value		Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile
Thallium	RfD	1.4E-05	mg/kg/day	Alopecia.	Rats	MOE, 2011	CalEPA DW, 1999	No
	RfD Sub-chronic	1.4E-04	mg/kg/day	Alopecia.	Rats	MOE, 2011	CalEPA DW, 1999 (modified) [b]	No
Tin	RfD	6.0E-01	mg/kg/day	Liver and kidney lesions.	Rats	USEPA RSL, 2013	USEPA HEAST, 1997	Yes
Toluene	RfD	8.0E-02	mg/kg/day	Increased kidney weight.	Rats	MOE, 2011	USEPA IRIS, 2005	No
	RfD Sub-chronic	8.0E-01	mg/kg/day	Increased kidney weight.	Rats	MOE, 2011	USEPA IRIS, 2005 (modified) [b]	No
	RfC	5.0E+00	mg/m^3	Neurological effects -occupational exposures.	Humans	MOE, 2011	USEPA IRIS, 2005	No
Trichlorobenzene, 1,2,4-	RfD	1.0E-02	mg/kg/day	Increased adrenal weights; vacuolization of zona fasciculata in the cortex.	Rats	MOE, 2011	USEPA IRIS, 1996	No
	RfD Sub-chronic	1.0E-01	mg/kg/day	Increased adrenal weights; vacuolization of zona fasciculata in the cortex.	Rats	MOE, 2011	USEPA IRIS, 1996 (modified) [b]	No
	RfC	8.0E-03	mg/m^3	Liver toxicity.	Rats	MOE, 2011	WHO EHC, 1991 (modified) [b]	No
Trichloroethane, 1,1,1-	RfD	2.0E+00	mg/kg/day	Reduced body weight.	Mice	MOE, 2011	USEPA IRIS, 2007	No
	RfD Sub-chronic	7.0E+00	mg/kg/day	Reduced body weight.	Mice	MOE, 2011	USEPA IRIS, 2007	No
	RfC	5.0E+00	mg/m^3	Liver histopatholgical changes.	Rats	USEPA IRIS, 2007	-	No
	RfC Sub-chronic	5.0E+00	mg/m^3	Liver histopatholgical changes.	Rats	USEPA IRIS, 2007	-	Yes
Trichloroethane, 1,1,2-	RfD	4.0E-03	mg/kg/day	Adverse liver and erythrocyte effects.	Mice	MOE, 2011	USEPA IRIS, 1995	No
	RfD Sub-chronic	4.0E-02	mg/kg/day	Adverse liver and erythrocyte effects.	Mice	MOE, 2011	USEPA IRIS, 1995 (modified) [b]	No
	SF	5.7E-02	1/[mg/kg/day]	Hepatocellular carcinoma.	Mice	MOE, 2011	USEPA IRIS, 1994	No
	URF	1.6E-02	$1/[mg/m^3]$	Hepatocellular carcinoma.	Mice	MOE, 2011	USEPA IRIS, 1994	No
Trichloroethylene	RfD	4.8E-04	mg/kg/day	Multiple: Developmental immunotoxicity, decreased thymus weights in mice, and heart malformations in rats. [g]	Mice, Rats	USEPA IRIS, 2011	-	Yes
	RfC	2.0E-03	mg/m^3	Multiple: Decreased thymus weights in mice and heart malformations in rats. [g]	Mice, Rats	USEPA IRIS, 2011	-	Yes
	SF	4.6E-02	1/[mg/kg/day]	Kidney cancers (mutagenic mode of action) and liver cancers.	Humans, Mice	USEPA IRIS, 2011	-	Yes
	URF	4.1E-03	$1/[mg/m^3]$	Kidney cancers (mutagenic mode of action) and liver cancers.	Humans, Mice	USEPA IRIS, 2011	-	Yes
Trichlorofluoromethane [e]	RfD	3.0E-01	mg/kg/day	Survival and histopathology.	Mice, Rats	MOE, 2011	USEPA IRIS, 1992	No
Vanadium (V)	RfD	2.1E-03	mg/kg/day	Developmental effects in offspring. [g]	Rats	MOE, 2011	CalEPA DW, 2000	No
	RfD Sub-chronic	2.1E-03	mg/kg/day	Developmental effects in offspring. g	Rats	MOE, 2011	CalEPA DW, 2000	No
	RfC	1.0E-03	mg/m^3	Chronic upper respiratory tract symptoms.	Humans	MOE, 2011	WHO, 2000	No
Vinyl Chloride	RfD	3.0E-03	mg/kg/day	Liver cell polymorphism.	Rats	MOE, 2011	ATSDR, 2006; USEPA IRIS, 2000	No
	RfC	6.0E-02	mg/m^3	Liver cell polymorphism.	Rats	TCEQ, 2009	-	Yes
	SF (continuous lifetime exposure from birth)	1.5E+00	1/[mg/kg/day]	Total of liver angiosarcoma, hepatocellular carcinoma, and neoplastic nodules.	Rats	WHO DW, 2004; 2011	-	Yes
	SF (continuous lifetime exposure during adulthood)	7.2E-01	1/[mg/kg/day]	Total of liver angiosarcoma, hepatocellular carcinoma, and neoplastic nodules.	Rats	USEPA IRIS, 2000	-	Yes
	URF (continuous lifetime exposure from birth)	8.4E-03	$1/[mg/m^3]$	Liver angiosarcomas, angiomas, hepatomas, and neoplastic nodules.	Rats	TCEQ, 2009	-	Yes
	URF (continuous lifetime exposure during adulthood)	4.4E-03	$1/[mg/m^3]$	Liver angiosarcomas, angiomas, hepatomas, and neoplastic nodules.	Rats	USEPA IRIS, 2000	-	Yes
Xylene Mixture	RfD	2.0E-01	mg/kg/day	Decreased body weight and increased mortality.	Rats	MOE, 2011	USEPA IRIS, 2003	No
	RfD Sub-chronic	4.0E-01	mg/kg/day	Hyperactivity.	Mice	MOE, 2011	ATSDR, 2007	No
	RfC	7.0E-01	mg/m^3	CNS effects; and irritation of the eyes, nose, and throat.	Humans	MOE, 2011	CalEPA ChREL, 2005	No
Zinc	RfD	3.0E-01	mg/kg/day	Decreases in erythrocyte Cu, Zn-superoxide dismutase (ESOD) activity.	Humans	MOE, 2011	USEPA IRIS, 2005	No
	RfC	1.4E-03	mg/m^3	Route-to-route extrapolation by MADEP.	-	MADEP, 2004	-	Yes

Notes:

[a.] TRVs revised where source agency listed by MOECC (2011) has updated the TRV.

[b.] MOECC derived toxicity values by modifying the proposed values in the cited source documents.

[c.] Noncancer TRV not available. Consistent with MOE (2011) Rationale Table.

[d.] Human carcinogenic potential of ingested beryllium cannot be identified.

[e.] Chemical is not considered a concern for inhalation exposure and toxicity.

[f.] Proxy/surrogate is chosen based on chemical's structural or functional similarity.

[g.] Additional consideration for developmental effects required for this chemical/route of exposure.

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA
Port Lands, Toronto, ON

Parameter	Toxicity Reference Value	Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile

Abbreviations and Acronyms:

ATSDR - Agency for Toxic Substances and Disease Register
CalEPA - California Environmental Protection Agency
CalEPA ARB - California Environmental Protection Agency Air Resources Board
CalEPA ATH - California Environmental Protection Agency Air Toxic Hotspots Program
CalEPA ChREL - California Environmental Protection Agency Chronic Reference Exposure Levels (REL)
CalEPA DW - California Department of Environmental Protection - Public Health Goals
CalEPA OEHHA - Office of Environmental Health Hazard Assessment
CCME - Canadian Council of Ministers of the Environment
CNS - Central Nervous System
DRI-Dietary Reference Intake
ESOD - Erythrocyte superoxide dismutase
HC - Health Canada
HC CSD - Health Canada Contaminated Sites Division
HC DW - Health Canada Drinking Water
HC PSL1 - Health Canada First Priority Substances List (PSL1) Assessments
HC PSL2 - Health Canada Second Priority Substances List (PSL2) Assessments
kg - kilogram
LOAEL - lowest observed adverse effect level
MADEP - Massachusetts Department of Environmental Protection
m^3 - cubic metres
mg/kg/day - milligrams per kilogram per day
mg/m^3 - milligrams per cubic metre
MOE - Ontario Ministry of the Environment
MOECC - Ontario Ministry of the Environment and Climate Change
MOE AAQC - Ontario Ministry of the Environment Ambient Air Quality Criteria
NA - not applicable
NAS - National Acadamy of Sciences
RfC - Reference Concentration
RfD - Reference Dose
RIVM - Netherlands National Institute of Public Health and Environmental Protection
SDH - sorbitol dehydrogenase
SF - Slope Factor
SGPT - serum glutamic pyruvic transaminase
TCEQ - Texas Commission on Environmental Quality
TEF - Toxicity Equivalence Factor
TERA - Toxicology Excellence for Risk Assessment
TPHCWG - Total Petroleum Hydrocarbon Criteria Working Group
URF - unit risk factor
USDA - United States Department of Agriculture
USEPA - United States Environmental Protection Agency
USEPA HEAST - Health Effects Assessment Summary Table
USEPA IRIS - United States Environmental Protection Agency Integrated Risk Information System
USEPA PPRTV - United States Environmental Protection Agency Provisional Peer Reviewed Toxicity Value
USEPA RSL - United States Environmental Protection Agency Regional Screening Levels
WHO - World Health Organization
WHO CICAD - World Health Organization Concise International Chemical Assessment Document (CICAD)
WHO DW - World Health Organization Drinking Water
WHO EHC - World Health Organization Environmental Health Criteria Monographs (EHC)

References:

ATSDR online database (http://www.atsdr.cdc.gov/). Reference date reflects the individual profiles which were prepared in different years.
CalEPA ARB, 1990. Air Resources Board.
CalEPA ATH, 2007. *Air Toxic Hotspots Program* .
CalEPA ChREL, 2000. Chronic Reference Exposure Levels.
CalEPA DW online Public Health Goals (http://www.oehha.org/water/phg/allphgs.html)
CalEPA OEHHA. Toxicity Criteria Database (http://oehha.ca.gov/tcdb/index.asp). Reference date reflects the individual profiles which were prepared in different years.
CCME, 2000. *Canada Wide Standards for Petroleum Hydrocarbons* .
HC, 1996. *Federal Contaminated Site Risk Assessment In Canada: Part II: Health Canada Toxicological Reference Values.*
HC DW. *Guidelines for Canadian Drinking Water Quality, Technical Documents* (http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php#tech_doc). Reference date reflects the individual profiles which were prepared in different years.
HC PSL2. *Second Priority Substances List (PSL2) Assessments* (http://www.hc-sc.gc.ca/ewh-semt/pubs/contaminants/psl2-lsp2/index-eng.php)
Kalberlah F, Frijus-Plessen N, & Hassauer M., 1995. *Toxicological Criteria for the Risk Assessment of Polycyclic Aromatic Hydrocarbons (PAH) in Existing Chemicals. Part 1: The Use of Equivalency Factors.*
MADEP, 2003. *Updated Petroleum Hydrocarbon Fraction Toxicity Values for the VPH/EPH/APH Methodology* (http://www.mass.gov/eea/docs/dep/cleanup/laws/tphtox03.pdf)
MADEP, 2004. *Revisions to Dose-Response Values used in Human Health Risk Assessment*. Common Wealth of Massachusetts, Executive Office of Environmental Affairs, Department of Environmental Protection.
MOE AAQC. *Ambient Air Quality Criteria* . Standards Development Branch, Ontario Ministry of the Environment. (http://www.ene.gov.on.ca/environment/en/resources/STDPROD_096586.html)
MOE, 2007. Ontario Standards for Lead and Lead Compounds. Standards Development Branch. Ontario Ministry of the Environment. June.
MOE, 2011 (Revised). Original MOE (2011) value has been updated by the source agency.
MOE, 2011. *Rationale for the Development of Soil and Ground Water Standards for Use at Contaminated sites in Ontario* . April.
NAS, 2010. DRI Tables and Application Reports (https://fnic.nal.usda.gov/dietary-guidance/dietary-reference-intakes/dri-tables-and-application-reports).
RIVM, 2001. *Re-Evaluation of Human-Toxicological Maximum Permissible Risk Levels* . March.
TCEQ online *Final Development Support Documents* (http://www.tceq.texas.gov/toxicology/dsd/final.html). Reference date reflects the individual profiles which were prepared in different years.
TERA. 1999. Toxicological Review of Soluble Nickel Salts. March. (http://www.tera.org/ART/Nickel/Ni%20main%20text.PDF)
TPHCWG, 1997. *Development of Fraction-Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH) Vol.4.*
USDA, 2010. *DRI Tables and Application Reports* (https://fnic.nal.usda.gov/dietary-guidance/dietary-reference-intakes/dri-tables-and-application-reports).
USEPA HEAST, 1997. *Health Effects Assessment Summary Tables, FY 1997 Update* (http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=2877).

Table 11-5. Proposed Human Health Toxicity Reference Values for Use in the CBRA

Port Lands, Toronto, ON

Parameter	Toxicity Reference Value	Units	Effect/Basis	Study Population	Source [a]	Originating Agency/Author [b]	Candidate for Toxicity Profile

USEPA IRIS online database (http://www.epa.gov/IRIS/index.html). Reference date reflects the individual profiles which were prepared in different years.

USEPA online *Regional Screening Level* (RSL) (http://www.epa.gov/region9/superfund/prg/). Year is date of RSL table that was last reviewed for the specific parameter.

USEPA PPRTV. Provisional Peer Reviewed Toxicity Values for Superfund (http://hhpprtv.ornl.gov/quickview/pprtv_papers.php)

WHO Concise International Chemical Assessment Document (CICAD) (http://www.who.int/ipcs/publications/cicad/en/). Reference date reflects the individual profiles which were prepared in different years.

WHO DW, 2004/2011. *Guidelines for Drinking-Water Quality* . 2011.

WHO DW. Chemical hazards in drinking-water (http://www.who.int/water_sanitation_health/dwq/chemicals/en/). Reference date reflects the individual profiles which were prepared in different years.

WHO Environmental Health Criteria Monographs (EHC) (http://www.who.int/ipcs/publications/ehc/en/). Reference date reflects the individual profiles which were prepared in different years.

WHO, 2000. Air Quality Guidelines for Europe, 2nd Edition. WHO Regional Publications, European Series, No. 91. Copenhagen.

Table 11-6. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Soil

Port Lands, Toronto, ON

Analyte	MOECC Table 3 Ecological TRVs [a]		Other TRVs		
	Soil Organisms and Plants (µg/g)	Birds and Mammals (µg/g)	Value (µg/g)	Basis	Notes
1,1,1,2-Tetrachloroethane	--	--	**225**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,1,1-Trichloroethane	**18**	820	--	--	--
1,1,2,2-Tetrachloroethane	--	--	**0.127**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,1,2-Trichloroethane	80	--	**28.6**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,1'-Biphenyl	--	--	**60**	Terrestrial Plants	Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. Efroymson et. al. (1997).
1,1-Dichloroethane	**8.4**	--	20.1	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,1-Dichloroethene	50	**43**	--	--	--
1,2,4-Trichlorobenzene	**13**	--	--	--	--
1,2-Dibromoethane	--	--	**1.23**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,2-Dichlorobenzene	**3.4**	--	2.96	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,2-Dichloroethane	48	**29**	--	--	--
1,2-Dichloropropane	**25**	--	32.7	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,3-Dichlorobenzene	**4.8**	--	37.7	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,3-Dichloropropene (max)	25	--	**0.398**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1,4-Dichlorobenzene	3.6	--	**0.546**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
1+2-Methylnaphthalenes (max)	--	--	**3.24**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003) The value for 2-methylnaphthalene was used as a surrogate for 1-, 2-methylnaphthalenes.
2,4&2,6-Dinitrotoluene (max)	--	--	0.0328 (**0.92**)	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003). Dinitrotoluene 2,6 value included as it was lower than the Dinitrotoluene 2,4 value.
2-Butanone	**35**	9900	--	--	--
2-Hexanone	--	--	**12600**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
3,3`-Dichlorobenzidine	--	--	0.646 (**1**)	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
4-Chloroaniline	**20**	--	--	--	--

Table 11-6. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Soil

Port Lands, Toronto, ON

Analyte	MOECC Table 3 Ecological TRVs [a]		Other TRVs		
	Soil Organisms and Plants (µg/g)	Birds and Mammals (µg/g)	Value (µg/g)	Basis	Notes
4-Methyl-2-Pentanone	--	--	**443**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Acenaphthene	--	6600	**20**	Terrestrial Plants	Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision. Efroymson et. al. (1997).
Acenaphthylene	--	--	**682**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Acetone	--	**56**	--	--	--
Ammonia	--	--	--	--	No TRV selected.
Anthracene	**2.5**	38000	--	--	--
Antimony	**20**	25	--	--	--
Arsenic	**20**	51	--	--	--
Barium	750	**390**	--	--	--
Benzene	**25**	370	--	--	--
Benzo(a)anthracene	**0.5**	--	1	Interim Soil Quality Criteria	Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons Residential/Parkland Land Use) (Canadian Council of Ministers of the Environment [CCME], 2010)
Benzo(a)pyrene	**20**	1600	--	--	--
Benzo(b&j)fluoranthene	--	--	**1**	Interim Soil Quality Criteria	Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons Residential/Parkland Land Use) (Canadian Council of Ministers of the Environment [CCME], 2010)
Benzo(g,h,i)perylene	**6.6**	--	--	--	--
Benzo(k)fluoranthene	7.6	--	**1**	Interim Soil Quality Criteria	Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons Residential/Parkland Land Use) (Canadian Council of Ministers of the Environment [CCME], 2010)
Beryllium	**4**	13	--	--	--
Bis (2-chloroethyl) ether	--	--	**23.7**	Meadow Vole	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
bis (2-Chloroisopropyl) ether	--	--	**19.9**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Boron (hot water extractable) f	**1.5**	--	--	--	--
Bromide	--	--	--	--	No TRV selected.
Bromodichloromethane	--	--	0.54 (**13**)	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)

Table 11-6. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Soil

Port Lands, Toronto, ON

Analyte	MOECC Table 3 Ecological TRVs [a]		Other TRVs		
	Soil Organisms and Plants (µg/g)	Birds and Mammals (µg/g)	Value (µg/g)	Basis	Notes
Bromoform	--	--	**15.9**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Bromomethane	--	--	**0.235**	Meadow Vole	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Cadmium	12	**1.9**	--	--	--
Calcium	--	--	--	--	No TRV selected.
Carbon tetrachloride	**5.8**	7.6	--	--	--
Chloride (Cl)	--	--	--	--	No TRV selected.
Chlorobenzene	**6**	--	13.1	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Chlorodibromomethane	--	--	2.05 (**9.4**)	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Chloroform	**34**	81	--	--	--
Chromium	310	**160**	--	--	--
Chrysene	**7**	--	4.73 (7)	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
cis-1,2-Dichloroethene	--	**84**	--	--	--
Cobalt	**40**	180	--	--	--
Copper	**140**	770	--	--	--
Cyanide	0.9	**0.11**	--	--	--
Dibenzo(a,h)anthracene	--	--	**1**	Interim Soil Quality Criteria	Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons Residential/Parkland Land Use) (Canadian Council of Ministers of the Environment [CCME], 2010)
Dichloromethane	**0.78**	350	--	--	--
Diethylphthalate	**11**	85	--	--	--
Dimethylphthalate	**17**	--	--	--	--
Electrical Conductivity [b]	**0.7**	--	--	--	--
Ethylbenzene	**55**	90	--	--	--
F1 (C6-C10) (max)	**210**	--	--	--	--
F2 (C10-C16) (max)	**150**	--	--	--	--
F3 (C16-C34) (max)	**300**	--	--	--	--
F4 (C34-C50) (max)	**2800**	--	--	--	--
Fluoranthene	50	**0.69**	--	--	--
Fluorene	--	--	**122**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Hexachlorobenzene	**100**	--	--	--	--
Hexachlorobutadiene	--	--	--	--	No TRV selected.

Table 11-6. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Soil

Port Lands, Toronto, ON

Analyte	MOECC Table 3 Ecological TRVs [a]		Other TRVs		
	Soil Organisms and Plants (µg/g)	Birds and Mammals (µg/g)	Value (µg/g)	Basis	Notes
Hexachloroethane	--	--	--	--	No TRV selected.
Indeno(1,2,3-Cd)Pyrene	**0.38**	--	1	Interim Soil Quality Criteria	Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health: Polycyclic Aromatic Hydrocarbons Residential/Parkland Land Use) (Canadian Council of Ministers of the Environment [CCME], 2010)
Lead	250	**32**	--	--	--
Magnesium	--	--	--	--	No TRV selected.
Mercury	**10**	20	--	--	--
Methyl tert-butyl ether (MTBE)	**25**	--	--	--	--
Molybdenum	40	**6.9**	--	--	--
Naphthalene	**0.6**	380	--	--	--
n-Hexane	--	--	**75**	Soil and Food Ingestion (Provisional)	Ecological component values obtained from individual chemical factsheets produced to the support the derivation of the Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (CCME, 1999).
Nickel	**100**	5000	--	--	--
PCB, Total	33	**1.1**	--	--	--
Pentachlorophenol	17	**0.013**	--	--	--
Perchlorate	--	--	--	--	No TRV selected.
Phenanthrene	**6.2**	2700	--	--	--
Pyrene	--	**4700**	--	--	--
Selenium	10	**2.4**	--	--	--
Silver	**20**	--	--	--	--
Sodium Adsorption Ratio [b]	**5**	--	--	--	--
Strontium	--	--	--	--	No TRV selected.
Styrene	17	--	**4.69**	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Tetrachloroethene	**3.8**	4.5	--	--	--
Thallium	**1.4**	3.9	--	--	--
Toluene	150	**140**	--	--	--
trans-1,2-Dichloroethene	--	**84**	--	--	--
Trichloroethylene	100	**8.1**	--	--	--
Trichlorofluoromethane	**16**	--	16.4	Masked Shrew	Region 5 Ecological Screening Levels (United States Environmental Protection Agency [USEPA], 2003)
Vanadium	200	**18**	--	--	--
Vinyl Chloride	**3.4**	12	--	--	--
Xylenes, Total (max)	**95**	96	--	--	--

Table 11-6. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Soil

Port Lands, Toronto, ON

Analyte	MOECC Table 3 Ecological TRVs [a]		Other TRVs		
	Soil Organisms and Plants (µg/g)	Birds and Mammals (µg/g)	Value (µg/g)	Basis	Notes
Zinc	400	**340**	--	--	--
2-Chloroethyl Vinyl Ether	--	--	--	--	No TRV selected.
Chloroethane	--	--	--	--	No TRV selected.
Chloromethane	--	--	--	--	No TRV selected.

Notes:

[a.] Ecological component values from the table entitled *Soil Components for Table 3 – Full Depth, Non-potable Water Scenario* (Coarse Textured Soil, Residential/Parkland Land Use) (MOECC, 2011c). It is noted that Industrial/Commercial component values would be applicable in areas developed for commercial land use; however these are not included in this assessment, and the more conservative Residential/Parkland values are applied. The Industrial/Commercial component values may be considered in the development of the CBRA, if warranted.

[b.] Units for electrical conductivity are mS/cm and units for sodium adsorption ratio are SAR.

Bold - Lowest concentration selected as the TRV for the assessment. For ecological TRVs whose values are lower than the generic Table 3 SCS, the Table 3 SCS (MOECC, 2011b) is shown in brackets and was selected as the TRV for the assessment.

µg/g - micrograms per gram

-- - no value or not applicable

MOECC - Ontario Ministry of the Environment and Climate Change

TRV - Toxicity Reference Value

Table 11-7. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Groundwater

Port Lands, Toronto, ON

Parameter	MOECC GW3 Values [a] (µg/L)		Notes
	> 30 m from a Water Body	Within 30 m of a Water Body	
1,1,1,2-Tetrachloroethane	25000	20000	
1,1,2,2-Tetrachloroethane	30000	24000	
1,1,2-Trichloroethane	120000	94000	
1,1-Dichloroethane	2600000	2000000	
1,1-Dichloroethene	15000	12000	
1,2-Dibromoethane	120000	96000	
1,2-Dichloroethane	250000	200000	
1,2-Dichloropropane	72000	57000	
1,3-Dichloropropene (max)	3100	2400	
1,4-Dichlorobenzene	9600	7600	
1+2-Methylnaphthalenes (max)	1800	1500	
2-Hexanone	--	--	No TRV selected.
Acenaphthene	6600	5200	
Acenaphthylene	1.8	1.4	
Anthracene	2.4	1	
Barium	29000	23000	
Benzene	5800	4600	
Benzo(a)anthracene	1.6E+11	1.8	
Benzo(a)pyrene	3.4E+12	2.1	
Benzo(b&j)fluoranthene	6.9E+12	4.2	
Benzo(g,h,i)perylene	3.3E+11	0.2	
Benzo(k)fluoranthene	2.3E+12	1.4	
Bismuth	--	--	No TRV selected.
Bromomethane	4000	3200	
Cadmium	2.7	2.1	
Carbon tetrachloride	2500	2000	
Chloride (Cl)	2300000	1800000	
Chloroethane	--	--	No TRV selected.
Chloroform	16000	12000	
Chloromethane	--	--	No TRV selected.
Chrysene	1.1E+11	0.7	
cis-1,2-Dichloroethene	180000	140000	
Cobalt	66	52	
Copper	87	69	
Cyanide	66	52	
Dibenzo(a,h)anthracene	6.6E+11	0.4	
Dichloromethane	17000	13000	
Electrical Conductivity [b]	--	--	No TRV selected.

Table 11-7. Proposed Ecological Toxicity Reference Values for the Assessment of COCs in Groundwater

Port Lands, Toronto, ON

Parameter	MOECC GW3 Values [a] (µg/L)		Notes
	> 30 m from a Water Body	Within 30 m of a Water Body	
Ethylbenzene	2300	1800	
F1 (C6-C10) (max)	750	420	
F2 (C10-C16) (max)	970	170	
F3 (C16-C34) (max)	--	--	
F4 (C34-C50)	--	--	
Fluoranthene	41000	73	
Indeno(1,2,3-Cd)Pyrene	2.3E+12	1.4	
Lead	25	20	
Mercury	1.3E+13	7.7	
Methyl tert-butyl ether (MTBE)	1300000	1000000	
Naphthalene	7800	6200	
Nitrate (as N)	--	--	No TRV selected.
Nitrate-Nitrite (as N)	--	--	No TRV selected.
PCB, Total	2.3E+11	0.14	
Phenanthrene	920	380	
Pyrene	2700	5.7	
Silver	1.5	1.2	
Sodium	2300000	1800000	
Tetrachloroethene	11000	8400	
Tin	--	--	No TRV selected.
Toluene	18000	14000	
trans-1,2-Dichloroethene	280000	220000	
Trichloroethylene	280000	220000	
Vinyl Chloride	450000	360000	
Xylenes, Total (max)	4200	3300	

Notes:

µg/L - micrograms per litre

[a.] TRVs are the MOECC GW3 component values for groundwater to surface water for Tables 2/3 (applicable to groundwater > 30 m from a water body) or Table 6/7/8/9 (applicable to groundwater within 30 m of a water body) (MOECC, 2011c).

[b.] Units for electrical conductivity are mS/cm.

GW3 - Exposure pathway to aquatic biota via groundwater discharge to surface water

MOECC - Ontario Ministry of the Environment and Climate Change

Table 12-1. Typical RMMs for Brownfield Sites

Engineered Controls	Administrative Controls	Long-term Management
1) Capping - Soft cap (0.5 to 1.5 m thick) - Hard caps (0.225 m thick or more) - Utility corridors/preferential pathways - Site Plan (barrier quality and placement documentation) 2) Vapour Intrusion Mitigation - Vapour barrier - Subslab venting system - Submembrane venting system - Asbuilts; Proposed Testing and Performance Requirements documentation	Soil and Groundwater Management Plan* Health and Safety Plan	Groundwater monitoring Vapour Intrusion monitoring Inspection/maintenance program for caps and VI barriers Annual Reporting
*Draft Soil and Groundwater Management Plans have been developed and are included in CH2M (2015).		

Figures

N

0 30 60 90 120
Metres

- Address Points (From City Toronto Website)
- Community Based Risk Assessment Area

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 1
Community Based Risk Assessment Area
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\WORKINGFIGURES\STUDYAREA_ADDRESSPOINTS.MXD CSENTES 1/18/2016 2:20:26 PM

0 20 40 60 80
Metres

- Address Points (From City Toronto Website)
- Existing Building
- Heritage Building
- Community Based Risk Assessment Area

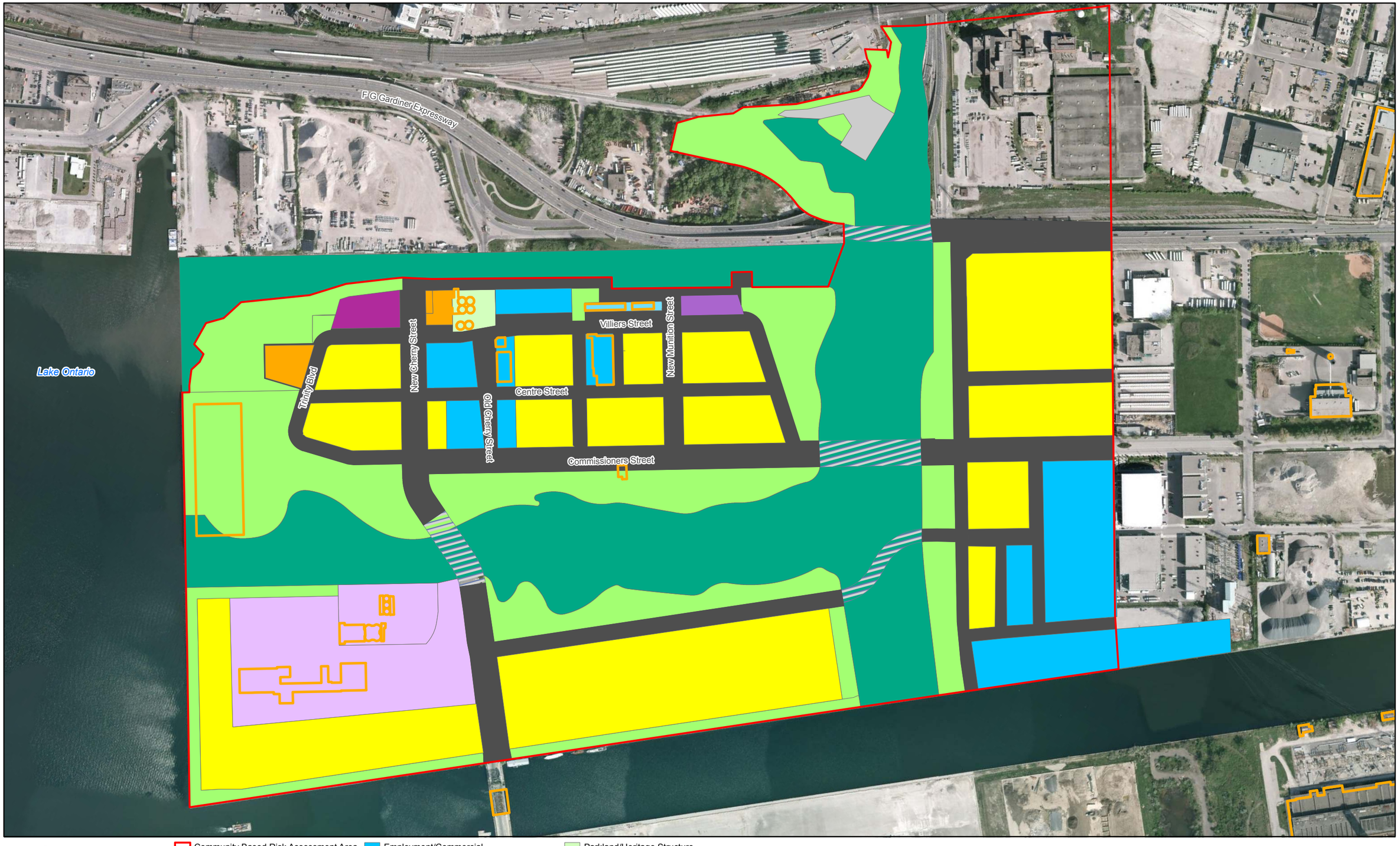
Current Land Use
- Road
- Industrial/Commerical

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 2
Current Land Use
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\CURRENTLANDUSE.MXD RMACDONALD 1/6/2016 6:04:26 PM



N

0 20 40 60 80

Metres

- Community Based Risk Assessment Area
- Heritage Building

Future Land Use

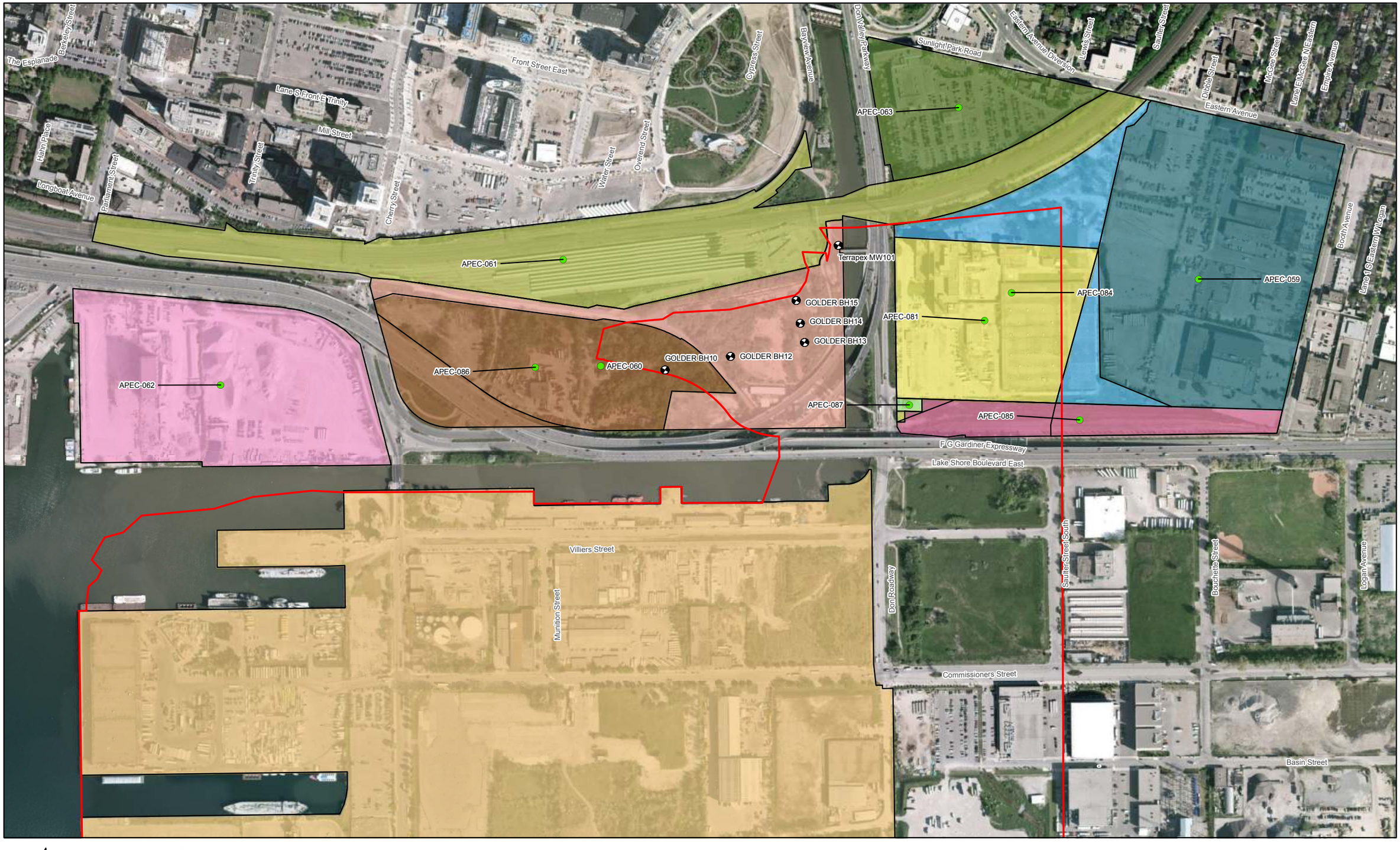
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 3
Future Land Use
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\FUTURELANDUSE.MXD ABATES1 1/8/2016 7:17:17 AM



N

0 20 40 60 80

Metres

Soil Sample
Soil and Groundwater Sample
PCA
APEC
Community Based Risk Assessment Area

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
2. APECs identified offsite are shown for context and are upgradient PCAs that result in an APEC at the property boundary

Figure 4A
Areas of Potential Environmental Concern and Sampling Locations- North
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\APECS_NORTH.MXD RMACDONALD 1/6/2016 6:02:28 PM

Soil Sample
Soil and Groundwater Sample
PCA
APEC
Community Based Risk Assessment Area

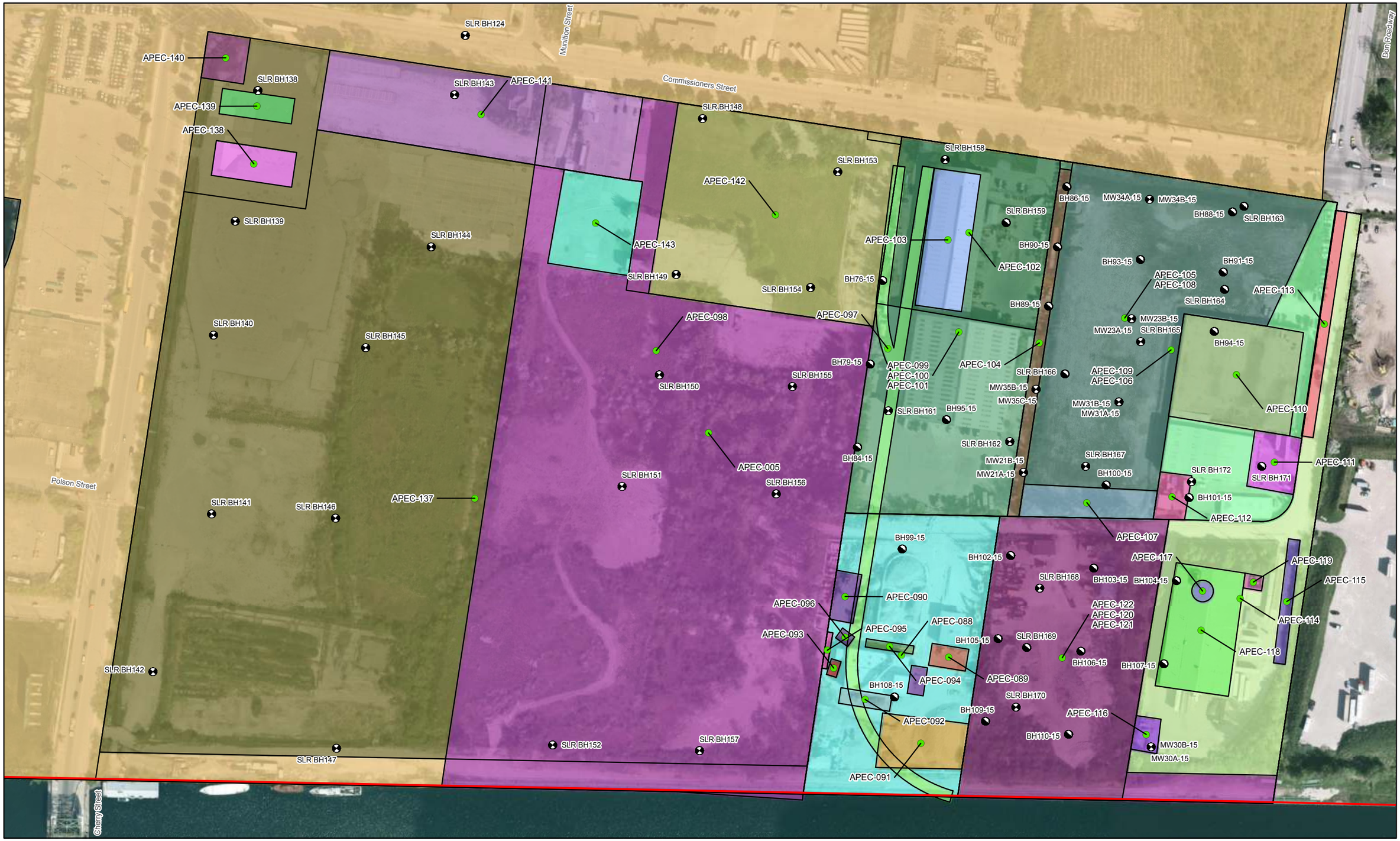
0 15 30
Metres

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 4B
Areas of Potential Environmental Concern and Sampling Locations- West
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\APECS_WEST.MXD RMACDONALD 1/7/2016 12:55:46 PM

ch2m



Soil Sample
Soil and Groundwater Sample
PCA
APEC
Community Based Risk Assessment Area

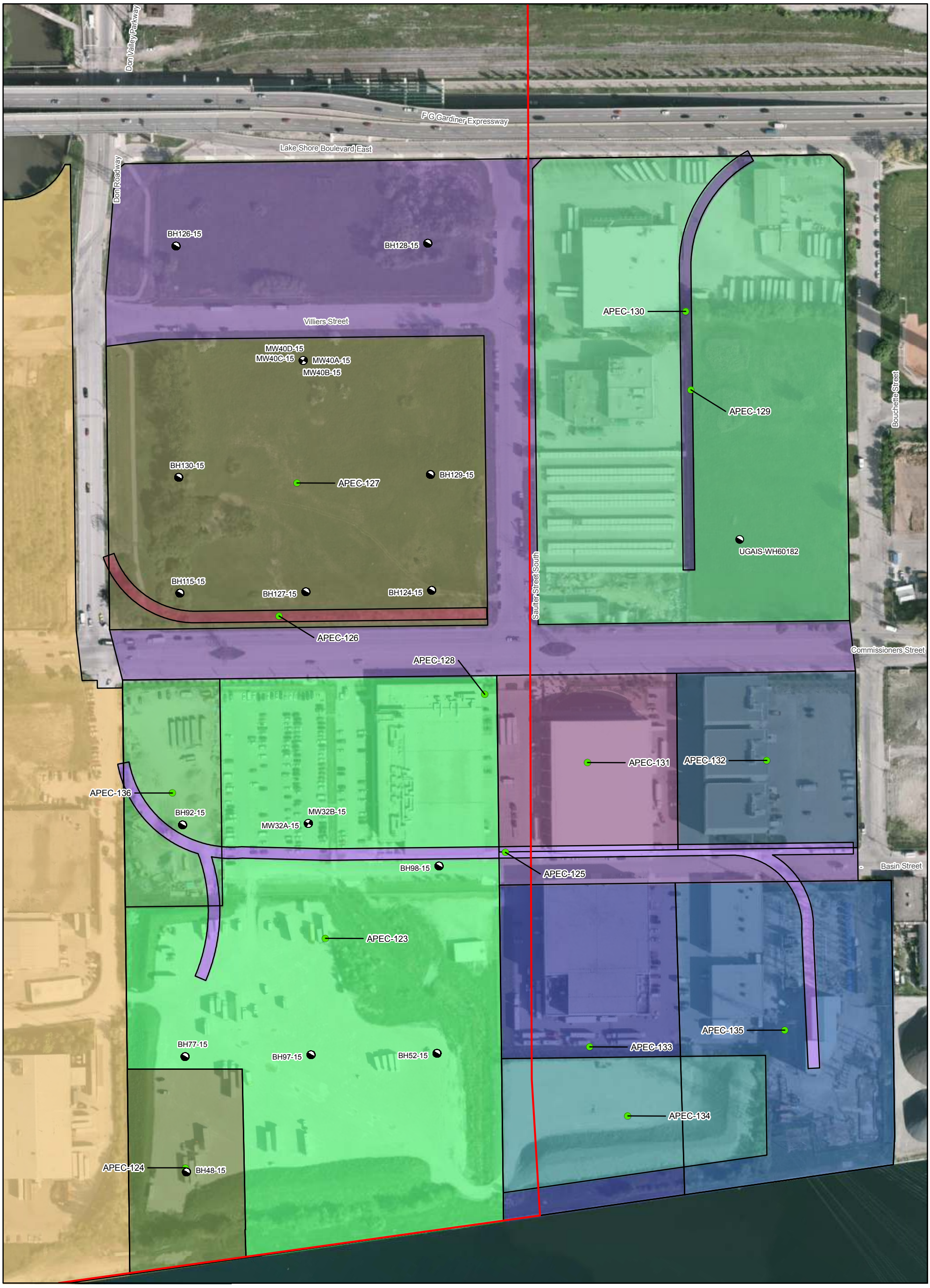
0 10 20 30 40
Metres

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 4C
Areas of Potential Environmental Concern and Sampling Locations- South
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\APECS_SOUTH.MXD RMACDONALD 1/6/2016 6:10:48 PM



Soil Sample
Soil and Groundwater Sample
PCA
APEC
Community Based Risk Assessment Area

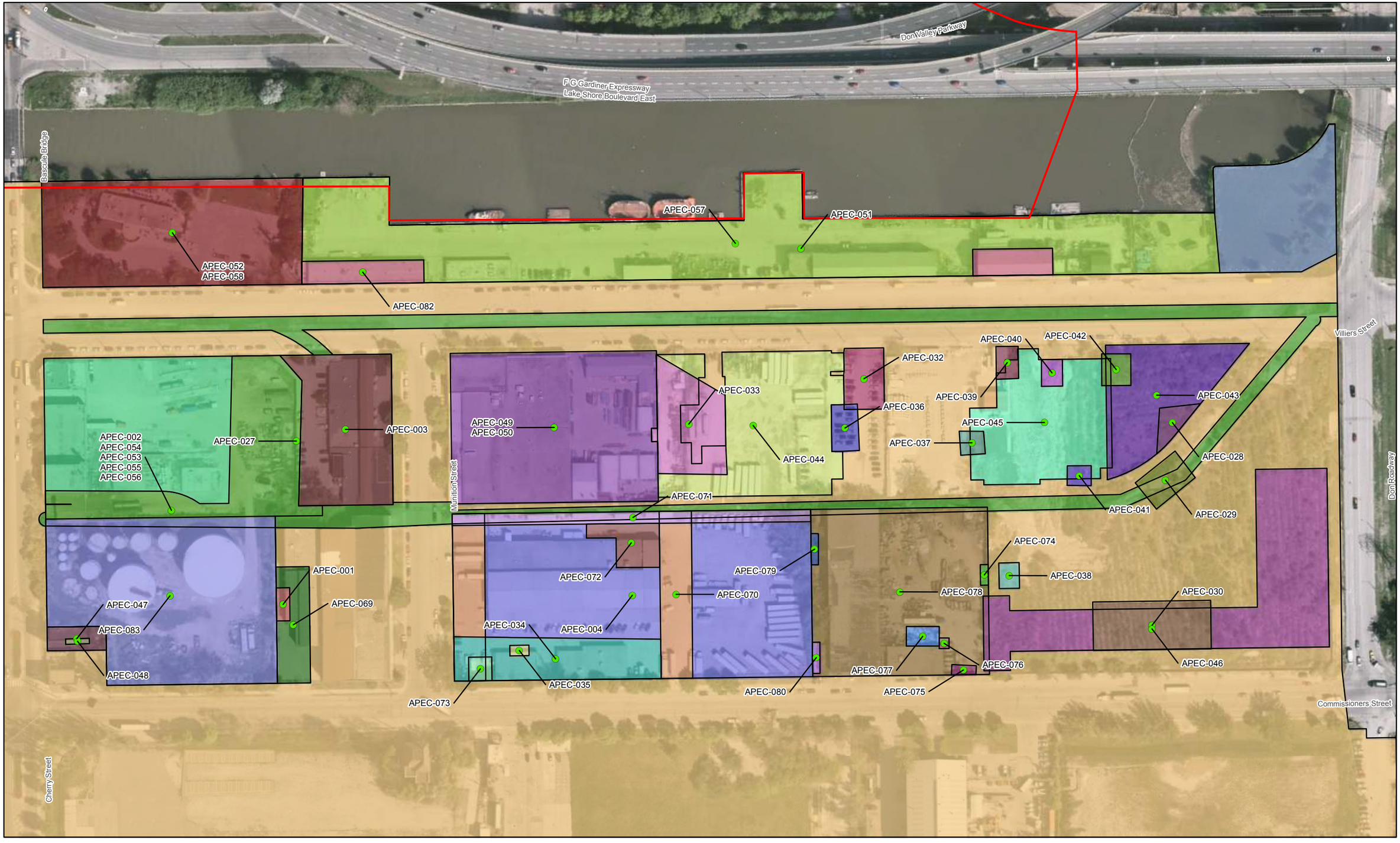
0 15 30
Metres

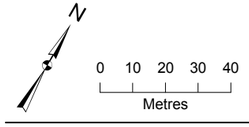
Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 4D
Areas of Potential Environmental Concern and Sampling Locations- East
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\APECS_EAST.MXD RMACDONALD 1/6/2016 6:12:34 PM

ch2m





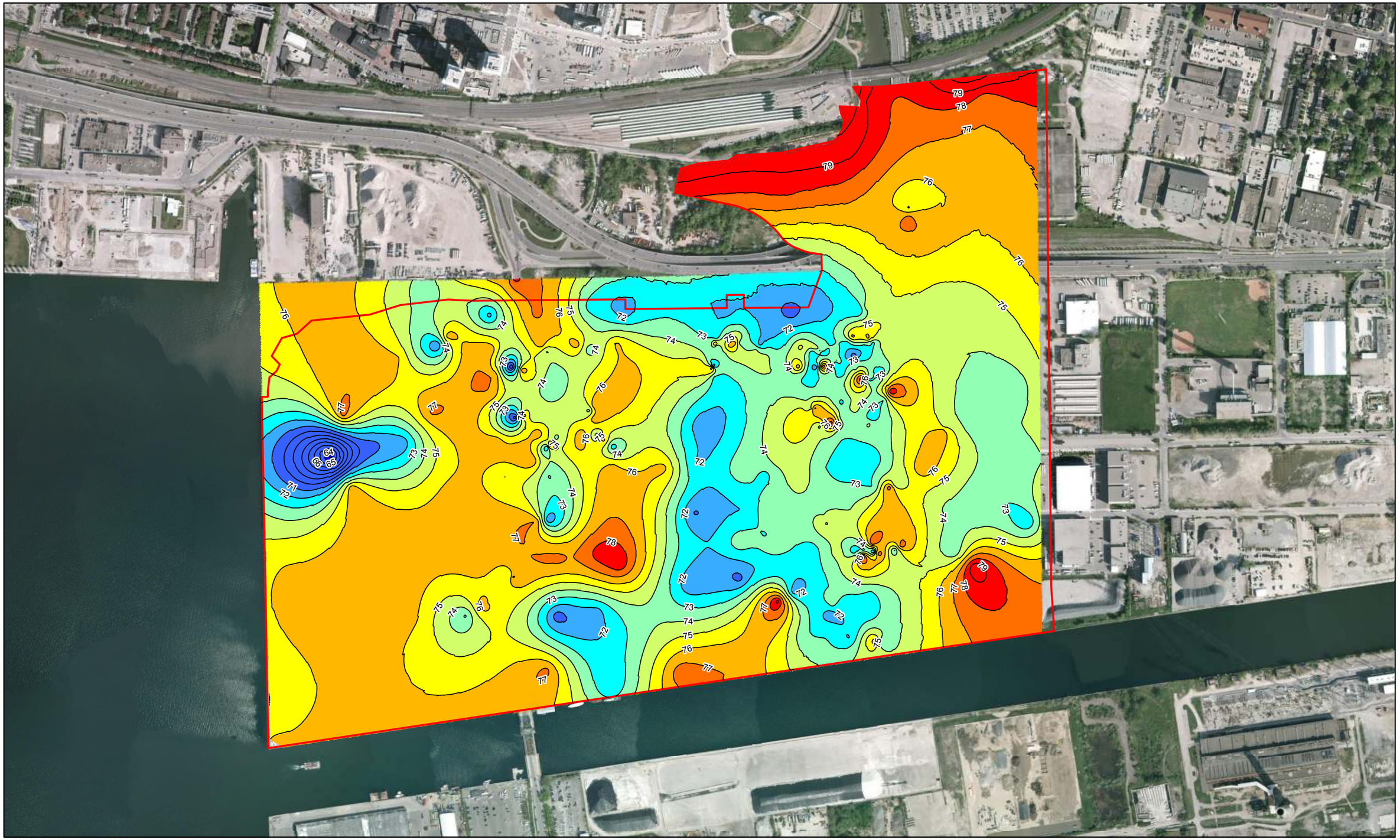
- Soil Sample
- Soil and Groundwater Sample
- APEC
- Community Based Risk Assessment Area

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 4E
Areas of Potential Environmental Concern and Sampling Locations- Central
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

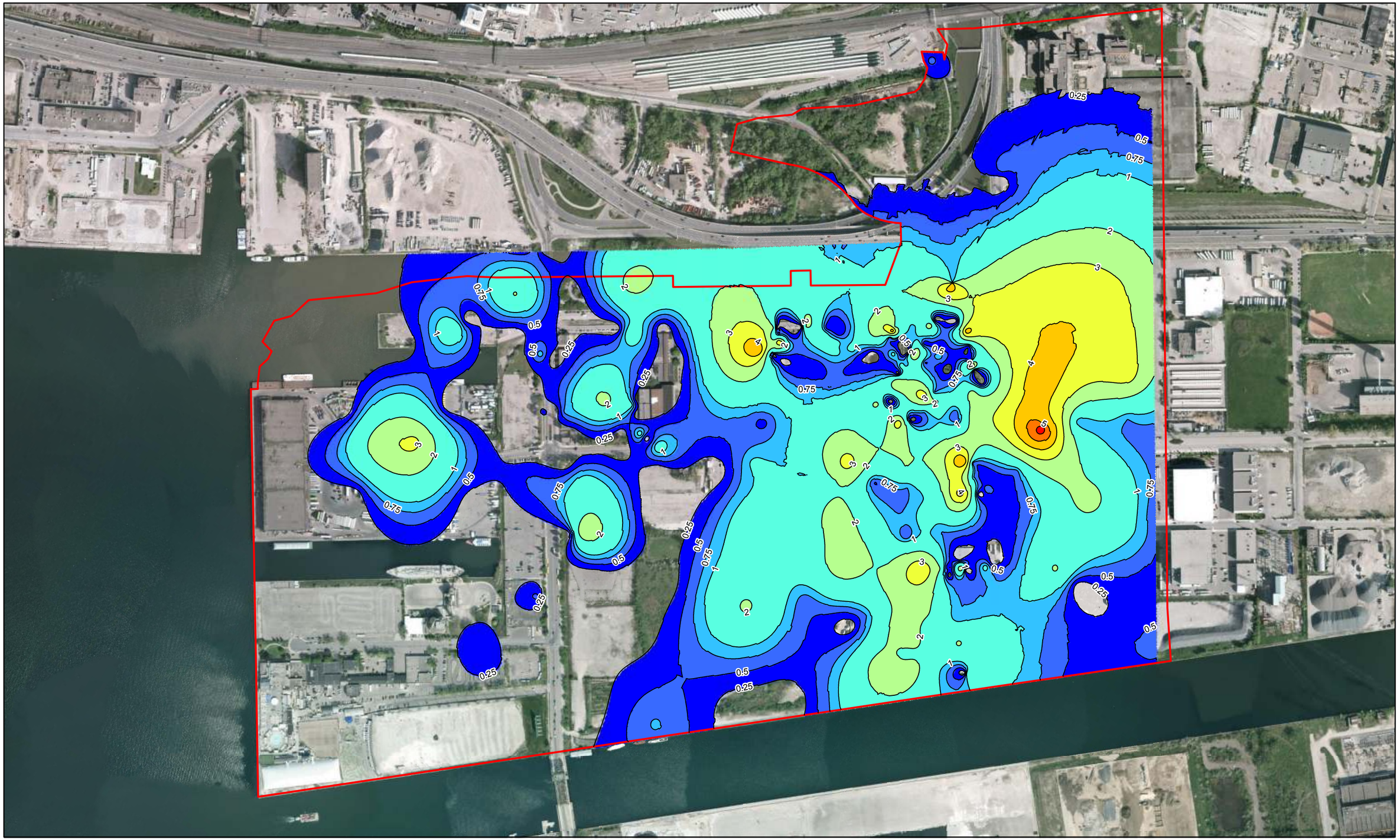
\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\APECS_MIDDLE.MXD RMACDONALD 1/6/2016 6:14:27 PM



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
2. Elevations are in metres above sea level.

Figure 5
Organic Layer Surface Elevation
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\ORGANICELEVATION.MXD RMACDONALD 1/6/2016 6:16:07 PM

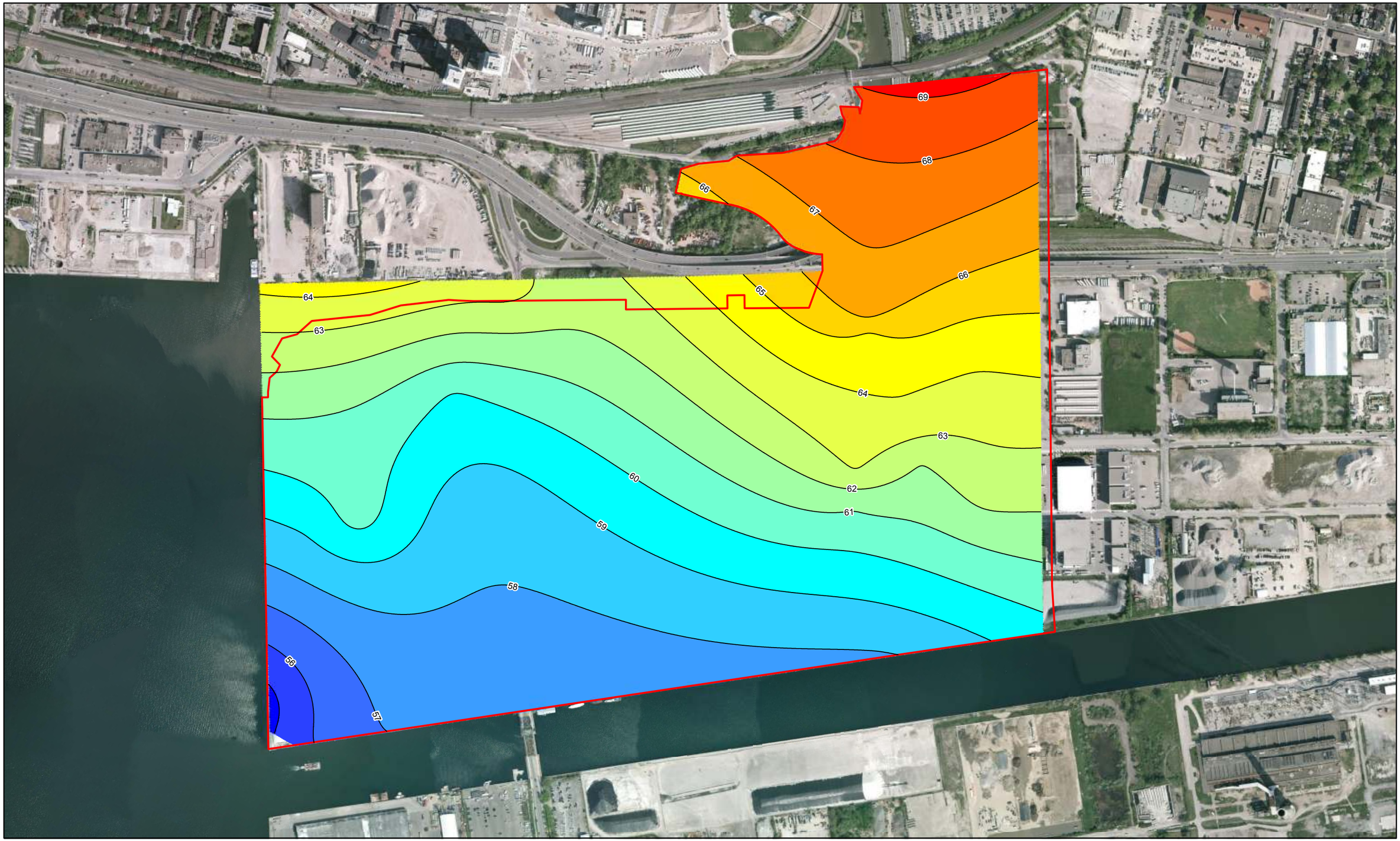


Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 6
Organic Layer Thickness
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\ORGANICTHICKNESS.MXD RMACDONALD 1/6/2016 6:16:56 PM



Community Based Risk Assessment Area

Elevation (masl)

< 55	57 - 58	61 - 62	65 - 66
55 - 56	58 - 59	62 - 63	66 - 67
56 - 57	59 - 60	63 - 64	67 - 68
	60 - 61	64 - 65	68 - 69
			69 - 70

0 20 40 60 80
Metres

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
2. Elevations are in metres above sea level.

Figure 7
Bedrock Surface Elevation
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\BEDROCKELEVATION.MXD RMACDONALD 1/6/2016 6:21:23 PM

0 20 40 60 80
Metres

Cross-section Location
Community Based Risk Assessment Area

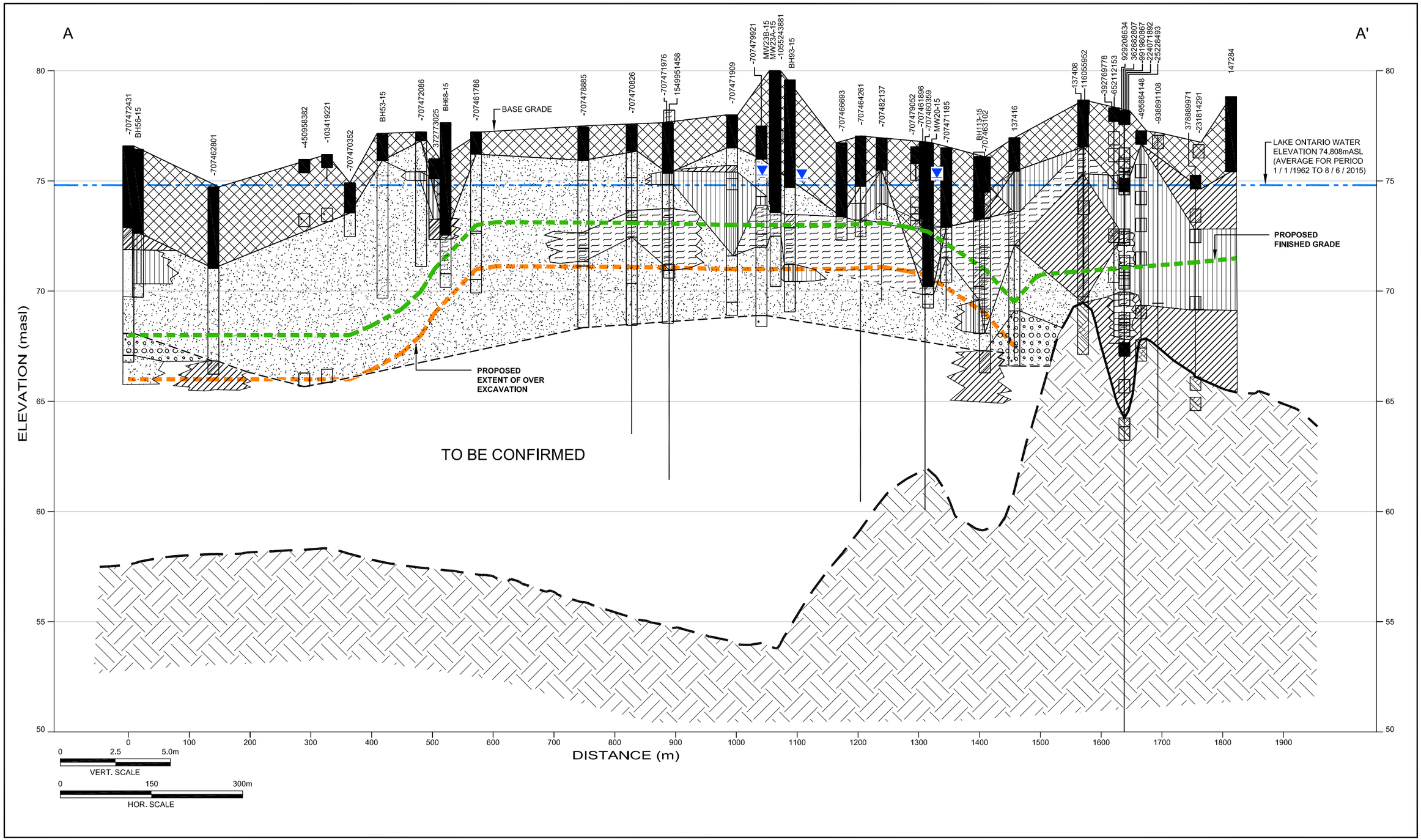
Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 8
Cross-section Locations
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\CROSSSECTIONLOCATIONS.MXD RMACDONALD 1/6/2016 6:43:03 PM

June 1, 2016



LEGEND

-707472431	DRILL HOLE IDENTIFICATION
masl	METRES ABOVE SEA LEVEL
▼	APPROXIMATE GROUNDWATER ELEVATION (masl)

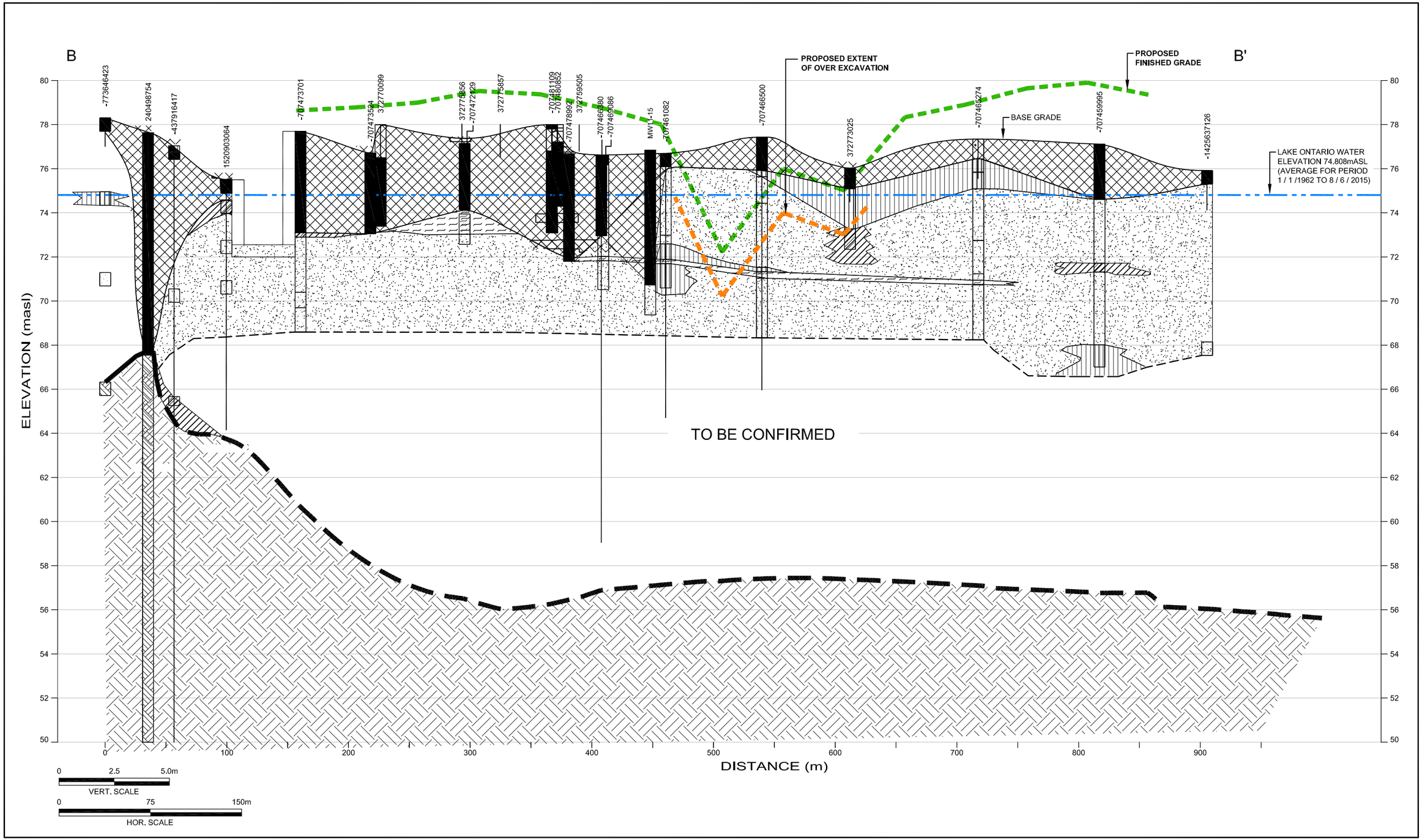
- FILL (MADE GROUND) (FILL)
- GLACIAL TILL (TILL)
- BR-LEAN CLAY (CLAY)
- POORLY GRADED SAND (SAND)
- POORLY GRADED GRAVEL (GRAVEL)
- ORGANIC
- SILT (SILT)
- BEDROCK (BEDROCK)

Figure 9A
Geologic Cross-section A - A'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F001.dwg

June 1, 2016



LEGEND

240498754	DRILL HOLE IDENTIFICATION
masl	METRES ABOVE SEA LEVEL
▼	APPROXIMATE GROUNDWATER ELEVATION (masl)

- FILL (MADE GROUND) (FILL)
- SILT (SILT)
- BR-LEAN CLAY (CLAY)
- POORLY GRADED SAND (SAND)
- POORLY GRADED GRAVEL (GRAVEL)
- ORGANIC
- BEDROCK (BEDROCK)

Figure 9B
Geologic Cross-section B - B'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F002.dwg

June 1, 2016

C

C'

ELEVATION (masl)

90
85
80
75
70
65
60
55
50

-707480971
-707478475
-1525238186
-732999393
-2121065356
-1911790517
1068557513
1533733510
300377273
1577646455
-1403853518
648247912
-1802176415
765294048
137407
983413603
137410
-1455817281
741098213
219912566
137417
137416
MW39A-15
BH113-15
BH113-15
115775
-707467696
-707464297
-707460359
-707461896
-707479052
-707477451
-707462096
-707473682
65515126
-707463480
1597968832
372759970
-707469959
-707465964
-707473953
-707482047
-707465810
BH104-15
BH107-15
240562362

PROPOSED
FINISHED GRADE

PROPOSED EXTENT
OF OVER EXCAVATION

BASE
GRADE

LAKE ONTARIO WATER
ELEVATION 74.808mASL
(AVERAGE FOR PERIOD
1 / 1 /1962 TO 8 / 6 / 2015)

TO BE CONFIRMED

0 100 200 300 400 500 600 700 800 900 1000

DISTANCE (m)

0 2.5 5.0m
VERT. SCALE

0 75 150m
HOR. SCALE

LEGEND

240498754 DRILL HOLE IDENTIFICATION

masl METRES ABOVE SEA LEVEL

APPROXIMATE GROUNDWATER ELEVATION (masl)

FILL (MADE GROUND) (FILL)

SILT (SILT)

BR-LEAN CLAY (CLAY)

POORLY GRADED SAND (SAND)

POORLY GRADED GRAVEL (GRAVEL)

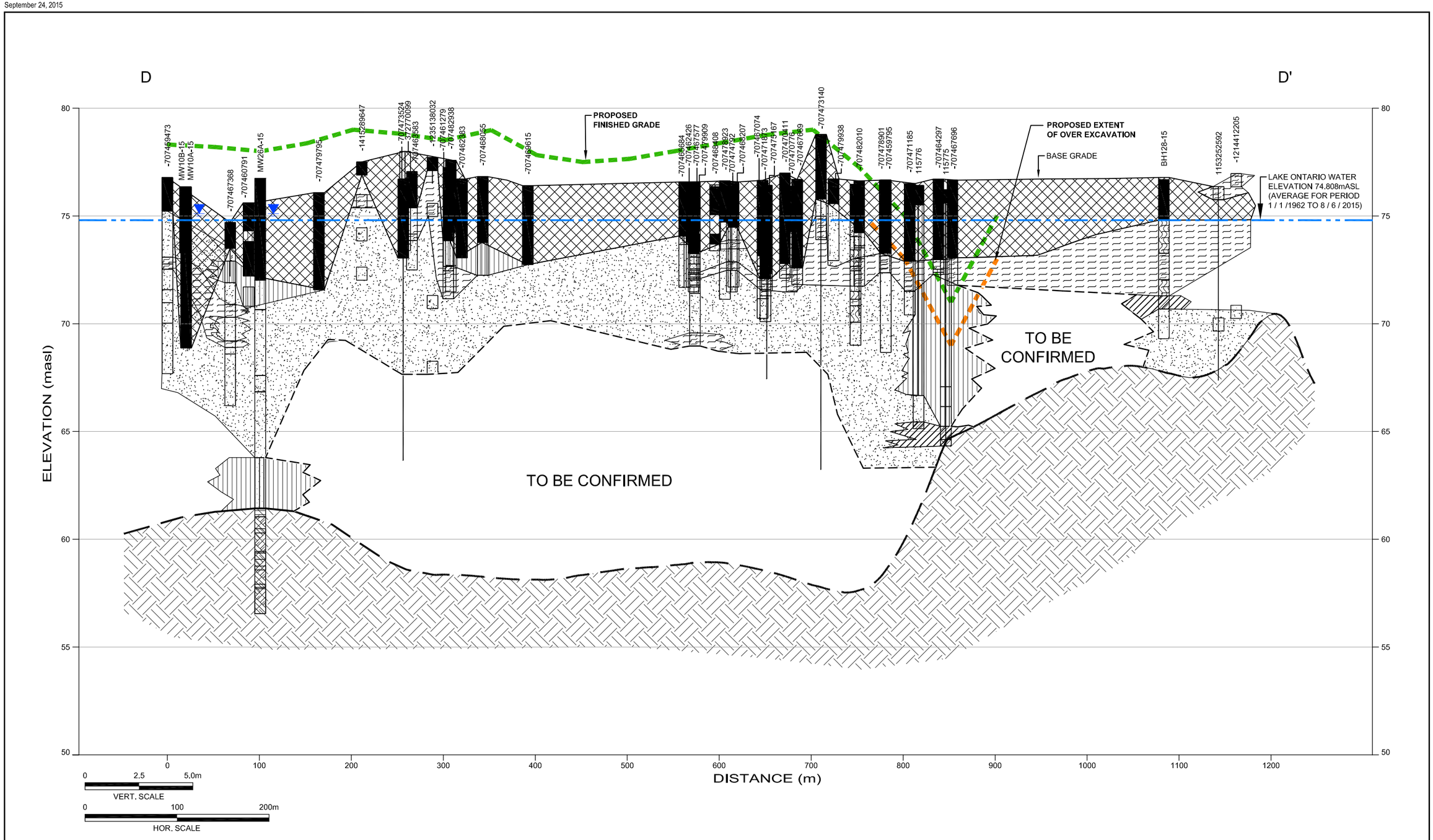
ORGANIC

BEDROCK (BEDROCK)

Figure 9C
Geologic Cross-section C - C'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F003.dwg



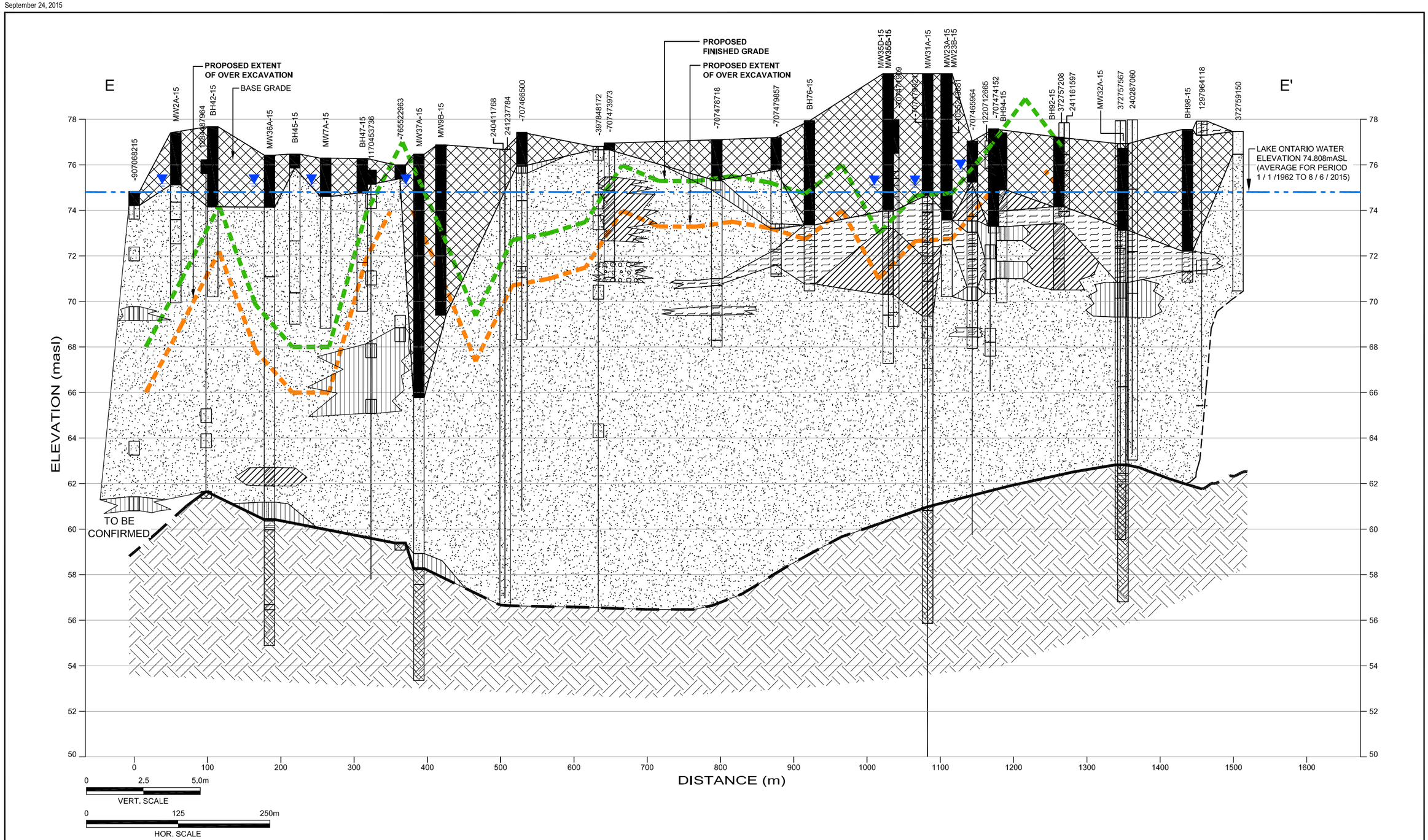
LEGEND

240498754	DRILL HOLE IDENTIFICATION	FILL (MADE GROUND) (FILL)	POORLY GRADED SAND (SAND)	BEDROCK (BEDROCK)
masl	METRES ABOVE SEA LEVEL	SILT (SILT)	POORLY GRADED GRAVEL (GRAVEL)	
▼	APPROXIMATE GROUNDWATER ELEVATION (masl)	BR-LEAN CLAY (CLAY)	ORGANIC	

Figure 9D
Geologic Cross-section D - D'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F004.dwg



LEGEND

-707472431 DRILL HOLE IDENTIFICATION

masl METRES ABOVE SEA LEVEL

APPROXIMATE GROUNDWATER ELEVATION (masl)

FILL (MADE GROUND) (FILL)

GLACIAL TILL (TILL)

BR-LEAN CLAY (CLAY)

POORLY GRADED SAND (SAND)

POORLY GRADED GRAVEL (GRAVEL)

ORGANIC

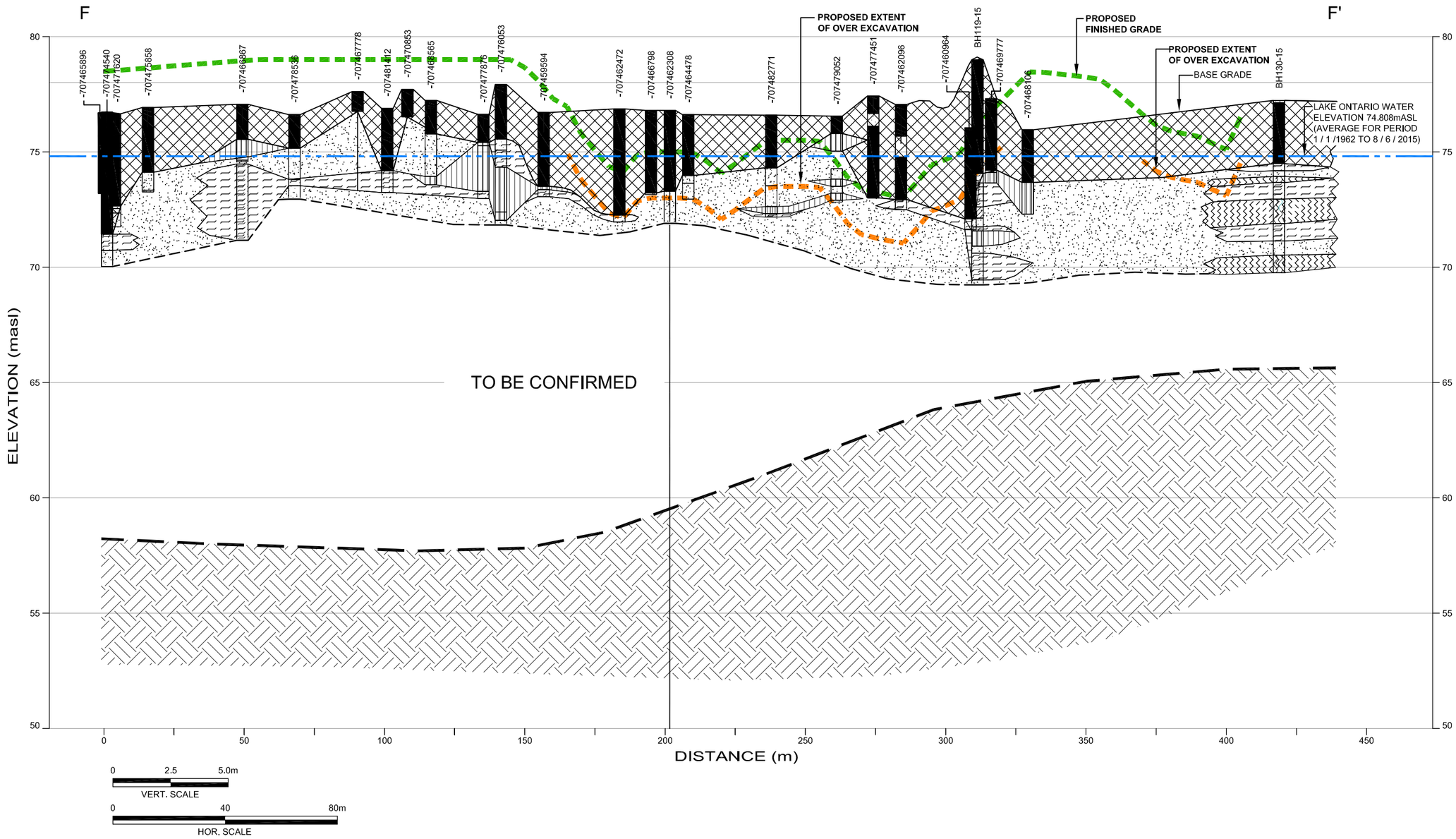
SILT (SILT)

BEDROCK (BEDROCK)

Figure 9E
Geologic Cross-section E - E'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F005.dwg



LEGEND

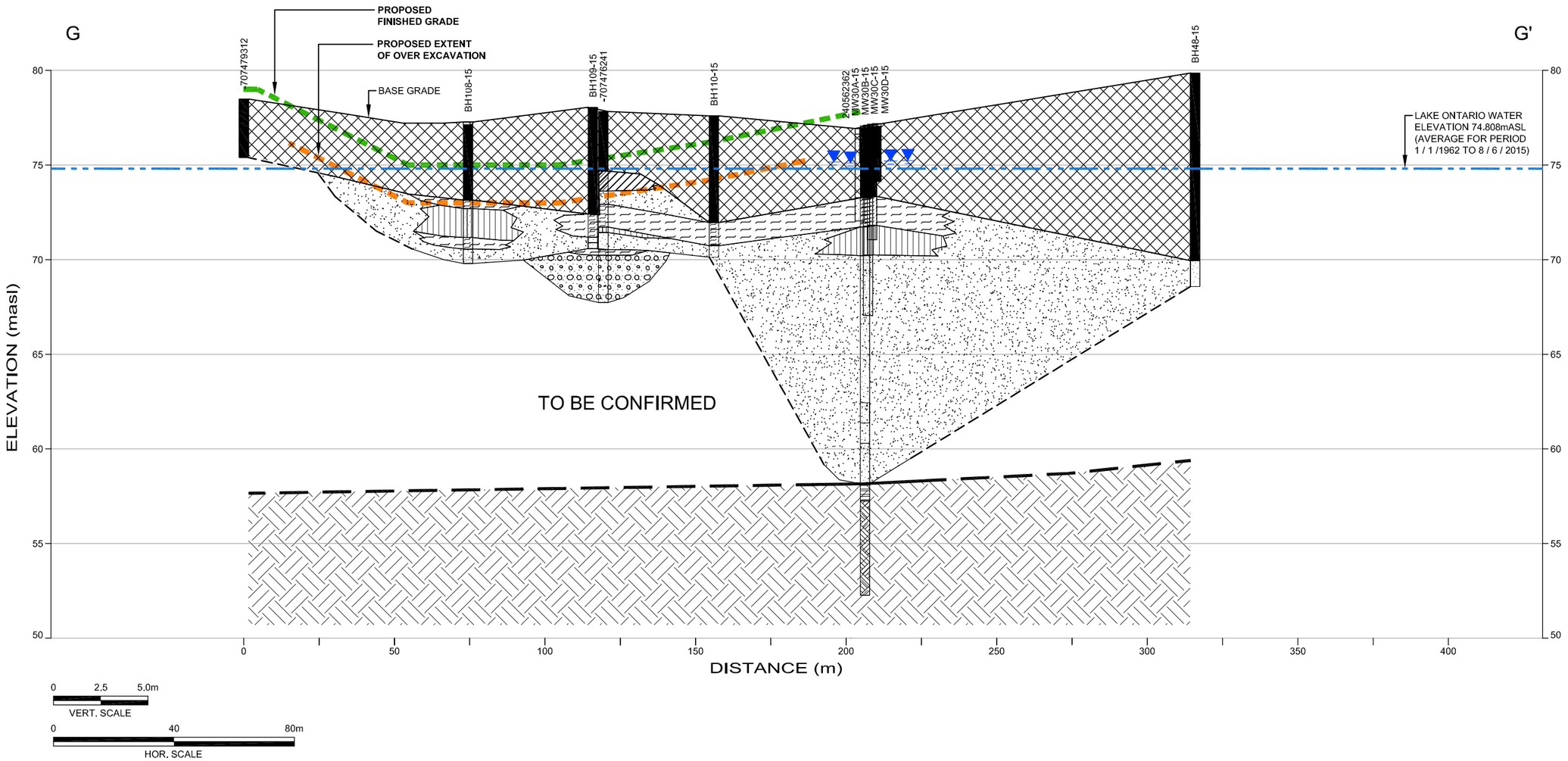
240498754 DRILL HOLE IDENTIFICATION

masl METRES ABOVE SEA LEVEL

- FILL (MADE GROUND) (FILL)
- SILT (SILT)
- BR-LEAN CLAY (CLAY)
- POORLY GRADED SAND (SAND)
- POORLY GRADED GRAVEL (GRAVEL)
- ORGANIC
- BEDROCK (BEDROCK)
- ORGANICS

Figure 9F
Geologic Cross-section F - F'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario



LEGEND

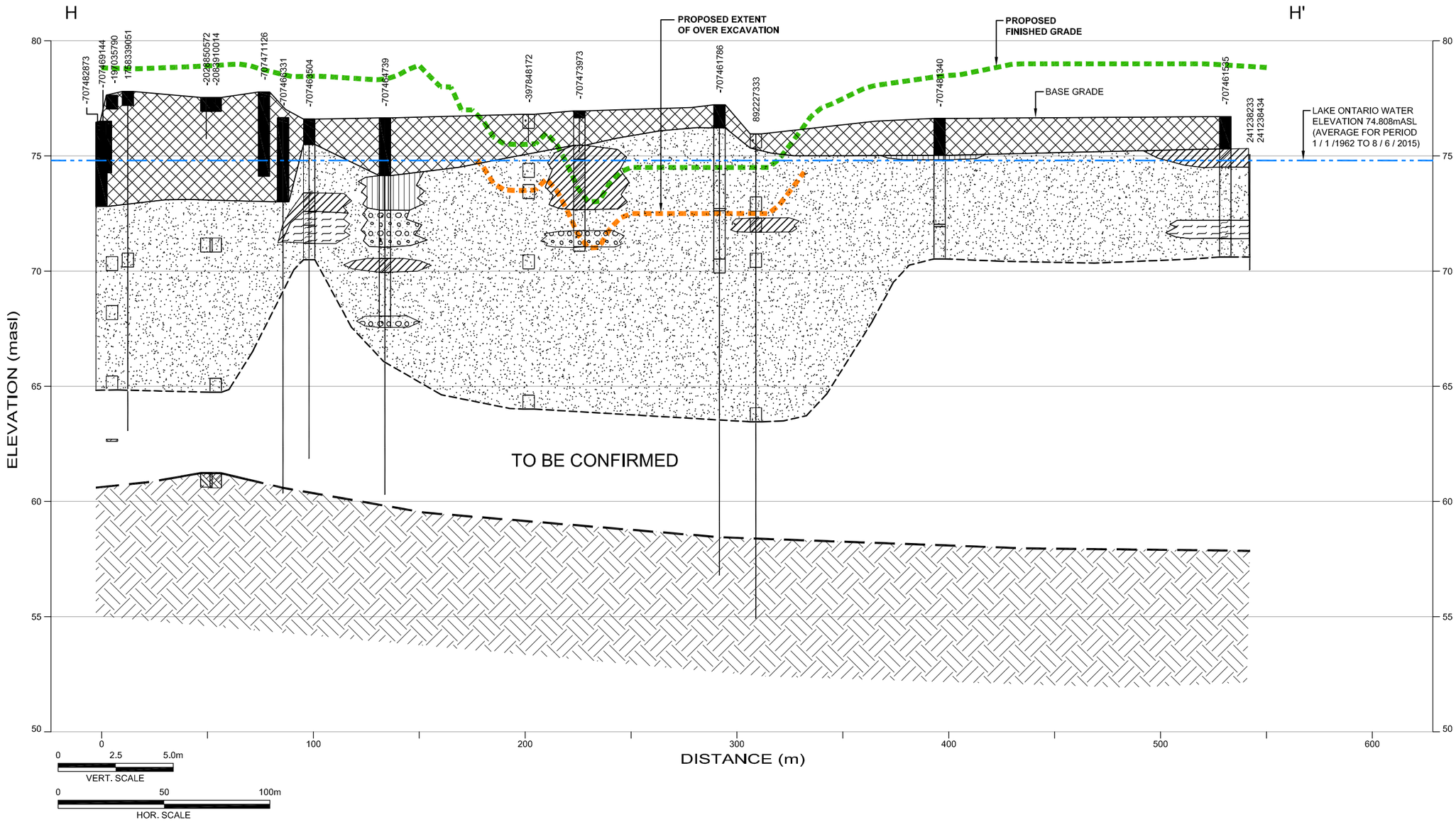
240498754	DRILL HOLE IDENTIFICATION
masl	METRES ABOVE SEA LEVEL

- FILL (MADE GROUND) (FILL)
- SILT (SILT)
- BR-LEAN CLAY (CLAY)
- POORLY GRADED SAND (SAND)
- POORLY GRADED GRAVEL (GRAVEL)
- ORGANIC
- BEDROCK (BEDROCK)

Figure 9G
Geologic Cross-section G - G'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F007.dwg



LEGEND

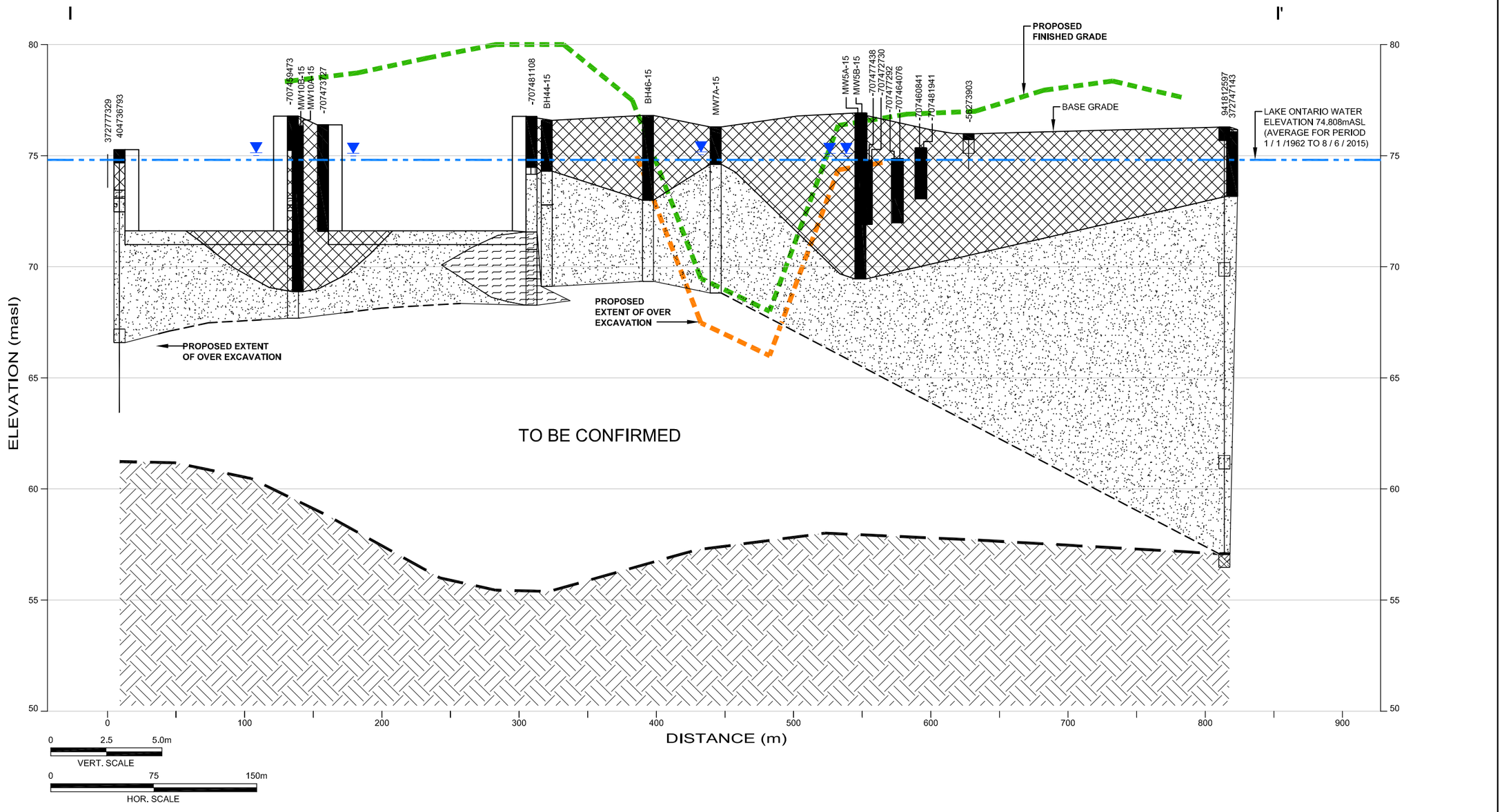
240498754	DRILL HOLE IDENTIFICATION
masl	METRES ABOVE SEA LEVEL

FILL (MADE GROUND) (FILL)
SILT (SILT)
BR-LEAN CLAY (CLAY)
POORLY GRADED SAND (SAND)
POORLY GRADED GRAVEL (GRAVEL)
ORGANIC
BEDROCK (BEDROCK)

Figure 9H
Geologic Cross-section H - H'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F008.dwg



LEGEND

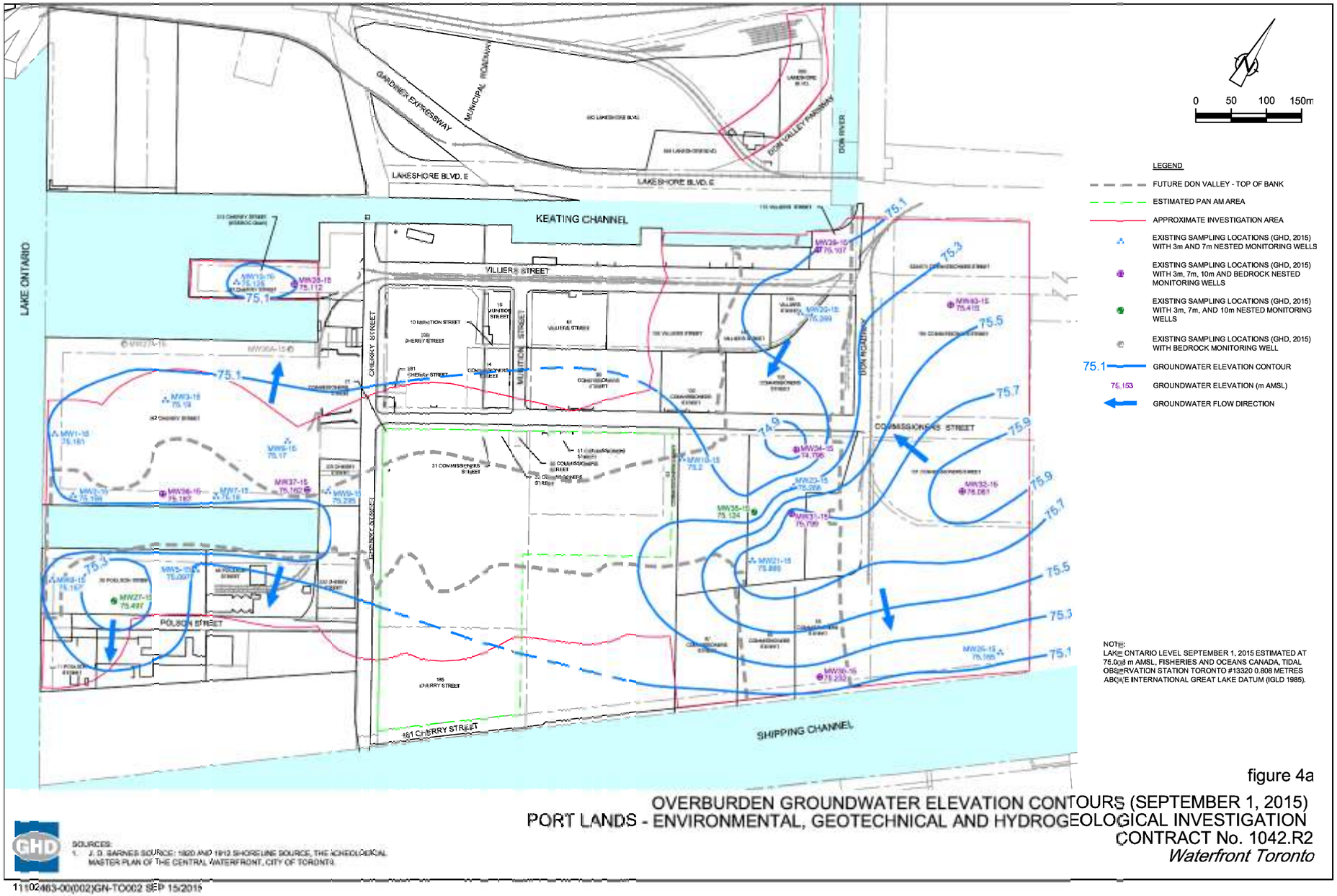
240498754	DRILL HOLE IDENTIFICATION
masl	METRES ABOVE SEA LEVEL
▼	APPROXIMATE GROUNDWATER ELEVATION (masl)

- FILL (MADE GROUND) (FILL)
- SILT (SILT)
- BR-LEAN CLAY (CLAY)
- POORLY GRADED SAND (SAND)
- POORLY GRADED GRAVEL (GRAVEL)
- ORGANIC
- BEDROCK (BEDROCK)

Figure 9I
Geologic Cross-section I - I'

Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

665331_F009.dwg



NOTE:
LAKE ONTARIO LEVEL SEPTEMBER 1, 2015 ESTIMATED AT 75.038 m AMSL, FISHERIES AND OCEANS CANADA, TIDAL OBSERVATION STATION TORONTO #13320 0.808 METRES ABOVE INTERNATIONAL GREAT LAKE DATUM (IGLD 1985).

figure 4a

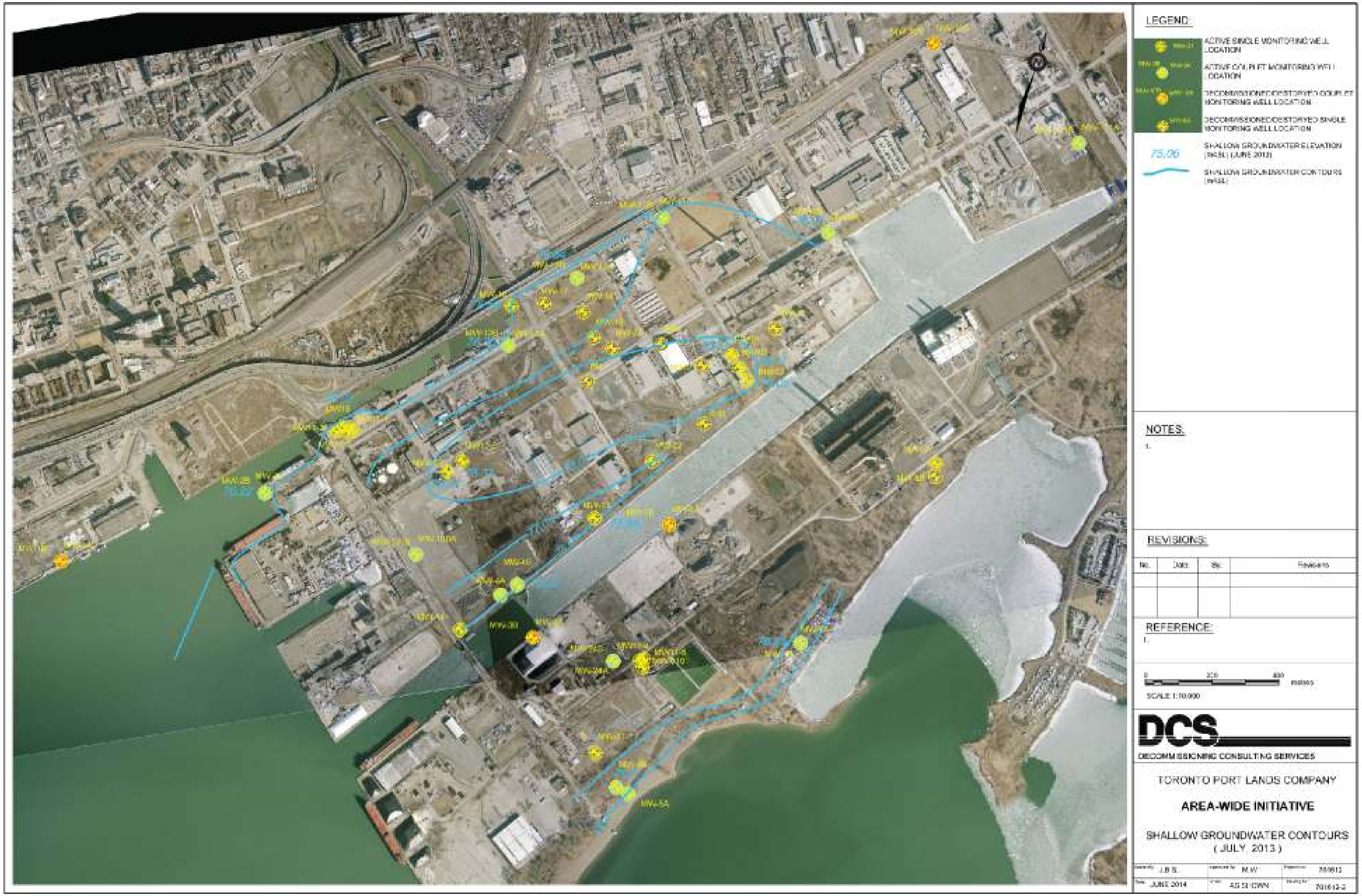
OVERBURDEN GROUNDWATER ELEVATION CONTOURS (SEPTEMBER 1, 2015)
PORT LANDS - ENVIRONMENTAL, GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
CONTRACT No. 1042.R2
Waterfront Toronto

SOURCES:
1. J. D. BARNES SOURCE: 1920 AND 1912 SHORELINE SOURCE, THE ICHEOLOGICAL MASTER PLAN OF THE CENTRAL WATERFRONT, CITY OF TORONTO

11102463-00(002)GN-TO002 SEP 15/2015

Notes:
1. Figure source: GHD, September 2015. Port Lands Environmental, Geotechnical, and Hydrogeological Investigation.

Figure 10A
Groundwater Piezometric Contours – Fill / Native Sand, September 1, 2015
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

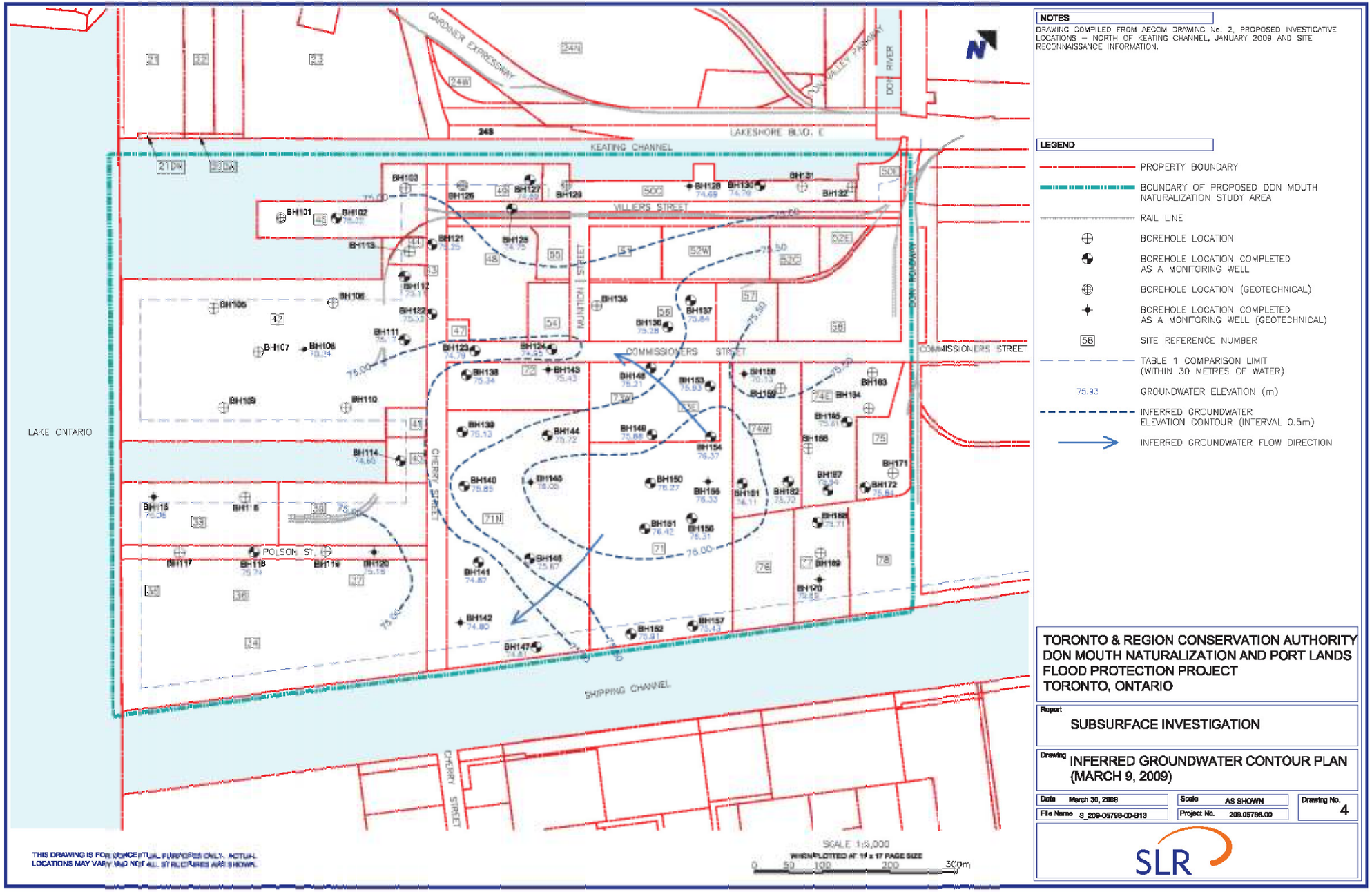


Notes:
1. Figure source: Decommissioning Consulting Services (DCS), July 2013.
Area-wide Initiative Groundwater Monitoring and Sampling Results - 2013

Figure 10B
Groundwater Piezometric Contours – Fill / Native Sand, July, 2013
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GWCONTOURS_FILL_JULY2013.MXD RMACDONALD 1/6/2016 6:52:18 PM



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

NOTES

DRAWING COMPILED FROM AECOM DRAWING No. 2, PROPOSED INVESTIGATIVE LOCATIONS – NORTH OF KEATING CHANNEL, JANUARY 2009 AND SITE RECONNAISSANCE INFORMATION.

LEGEND

- PROPERTY BOUNDARY
- BOUNDARY OF PROPOSED DON MOUTH NATURALIZATION STUDY AREA
- RAIL LINE
- BOREHOLE LOCATION
- BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
- BOREHOLE LOCATION (GEOTECHNICAL)
- BOREHOLE LOCATION COMPLETED AS A MONITORING WELL (GEOTECHNICAL)
- 58 SITE REFERENCE NUMBER
- TABLE 1 COMPARISON LIMIT (WITHIN 30 METRES OF WATER)
- 75.93 GROUNDWATER ELEVATION (m)
- INFERRED GROUNDWATER ELEVATION CONTOUR (INTERVAL 0.5m)
- INFERRED GROUNDWATER FLOW DIRECTION

TORONTO & REGION CONSERVATION AUTHORITY
DON MOUTH NATURALIZATION AND PORT LANDS FLOOD PROTECTION PROJECT
TORONTO, ONTARIO

Report: SUBSURFACE INVESTIGATION

Drawing: INFERRED GROUNDWATER CONTOUR PLAN (MARCH 9, 2009)

Date	March 30, 2009	Scale	AS SHOWN	Drawing No.
File Name	S_209-05798-00-913	Project No.	209.05798.00	4

SLR

Notes:
1. Figure source: SLR, March 2009. Toronto and Region Conservation Authority Don Mouth Naturalization and Port Lands Flood Protection Project, Subsurface Investigation.

Figure 10C
Groundwater Piezometric Contours – Fill / Native Sand, March 9, 2009
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

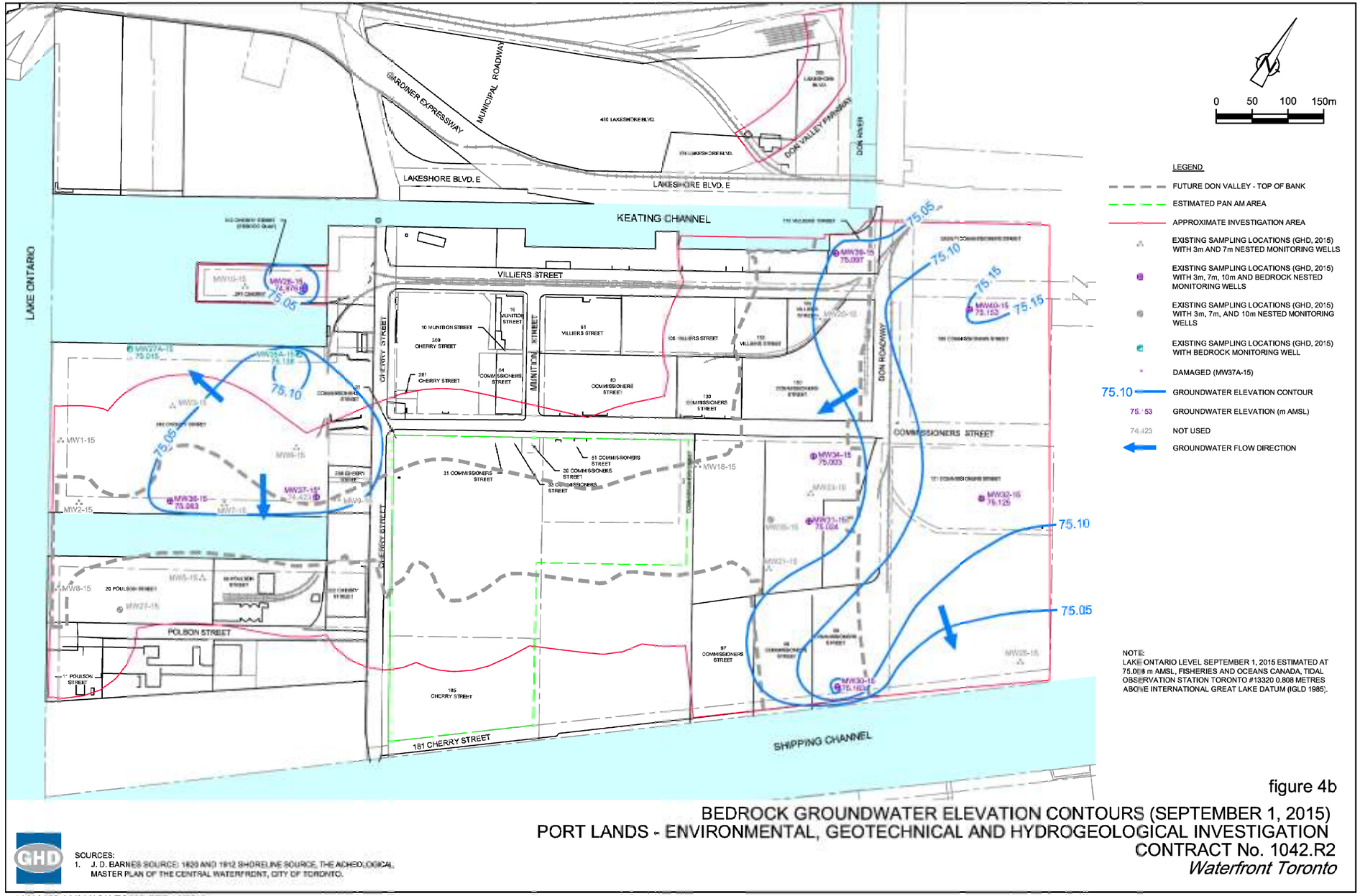


figure 4b

BEDROCK GROUNDWATER ELEVATION CONTOURS (SEPTEMBER 1, 2015)
PORT LANDS - ENVIRONMENTAL, GEOTECHNICAL AND HYDROGEOLOGICAL INVESTIGATION
CONTRACT No. 1042.R2
Waterfront Toronto

SOURCES:
1. J. D. BARNES SOURCE: 1828 AND 1912 SHORELINE SOURCE, THE ARCHEOLOGICAL MASTER PLAN OF THE CENTRAL WATERFRONT, CITY OF TORONTO.

11102463-00(002)GN-TO005 SEP 14/2015

Notes:
1. Figure source: GHD, September 2015. Port Lands Environmental, Geotechnical, and Hydrogeological Investigation.

Figure 11
Groundwater Potentiometric Contours – Bedrock, September 1, 2015
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GWCONTOURS_BEDROCK_SEPT2015.MXD RMACDONALD 1/7/2016 10:19:41 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

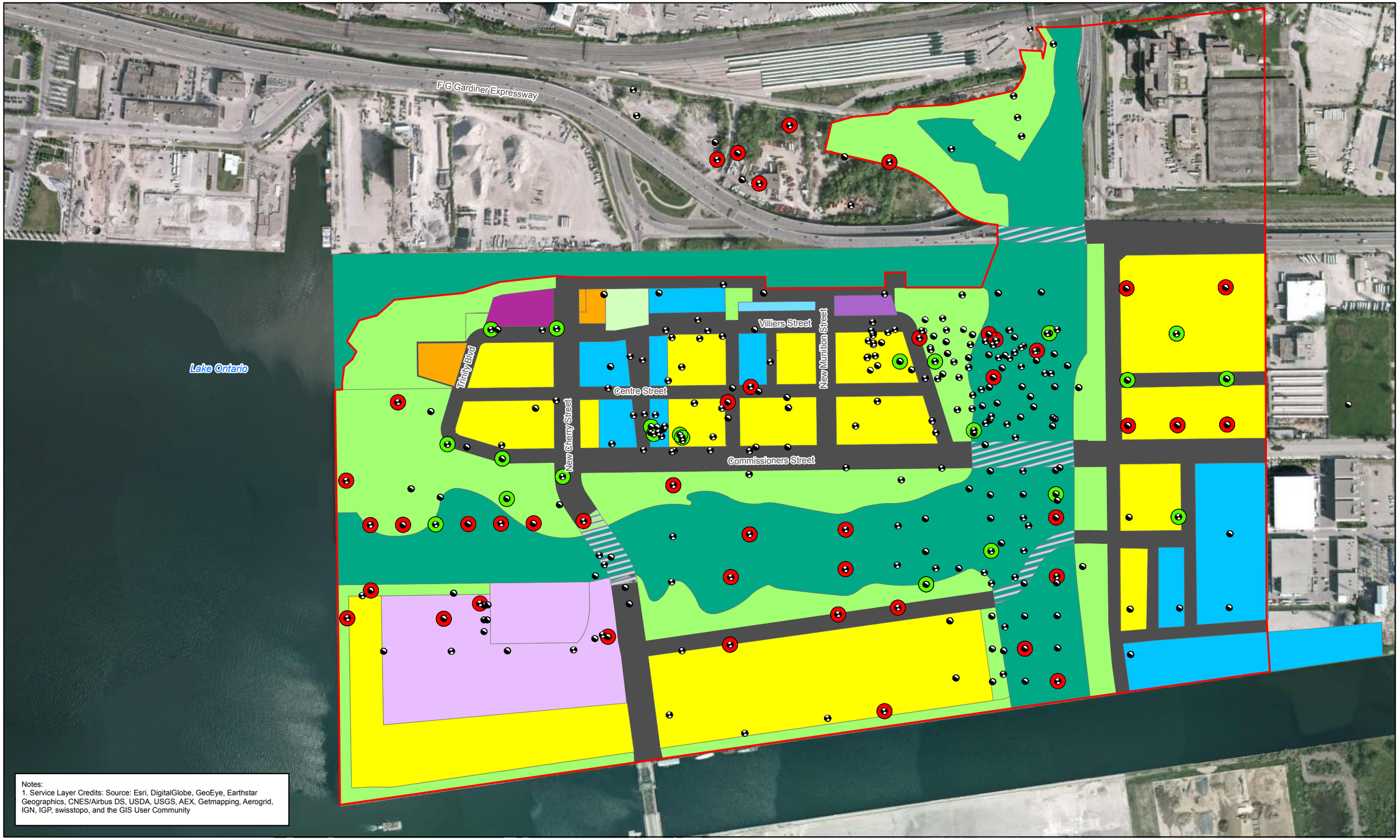
- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12A
Contaminant Distribution - Surface Soil (VOC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_VOC_SURFACE.MXD RMACDONALD 1/7/2016 1:31:16 PM



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

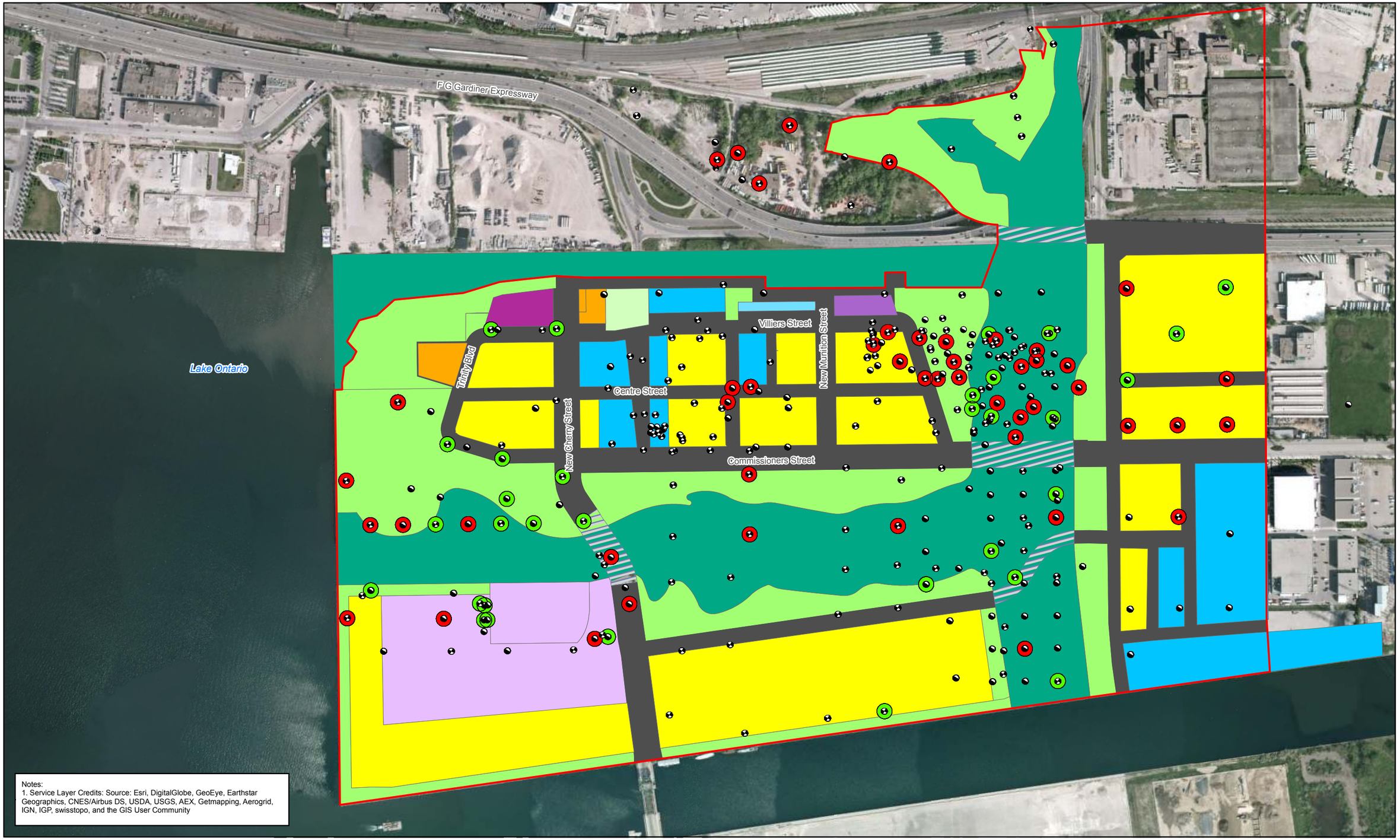
- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12B
Contaminant Distribution - Surface Soil (PHC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_PHC_SURFACE.MXD RMACDONALD 1/7/2016 10:48:17 AM



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12C
Contaminant Distribution - Surface Soil (PAH)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_PAH_SURFACE.MXD RMACDONALD 1/7/2016 11:01:11 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12D
Contaminant Distribution - Surface Soil (Metals & Inorganics)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_METALS_INORGANICS_SURFACE.MXD RMACDONALD 1/7/2016 11:19:34 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

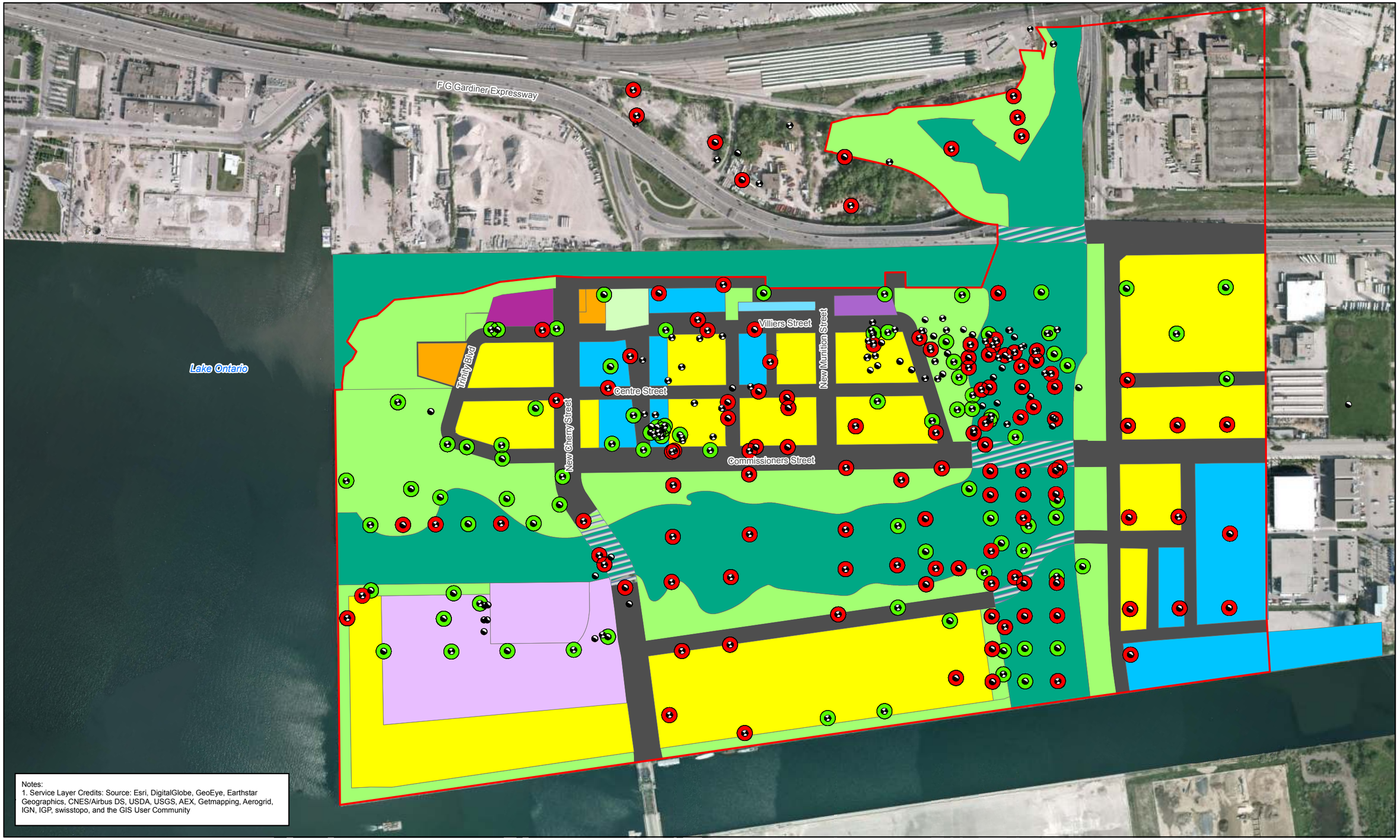
- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12E
Contaminant Distribution - Surface Soil (ABN, OCP, CP)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_ABN_OCP_CP_SURFACE.MXD RMACDONALD 1/7/2016 1:31:34 PM



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12F
Contaminant Distribution - Subsurface Soil (VOC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_VOC_SUBSURFACE.MXD RMACDONALD 1/7/2016 10:47:36 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

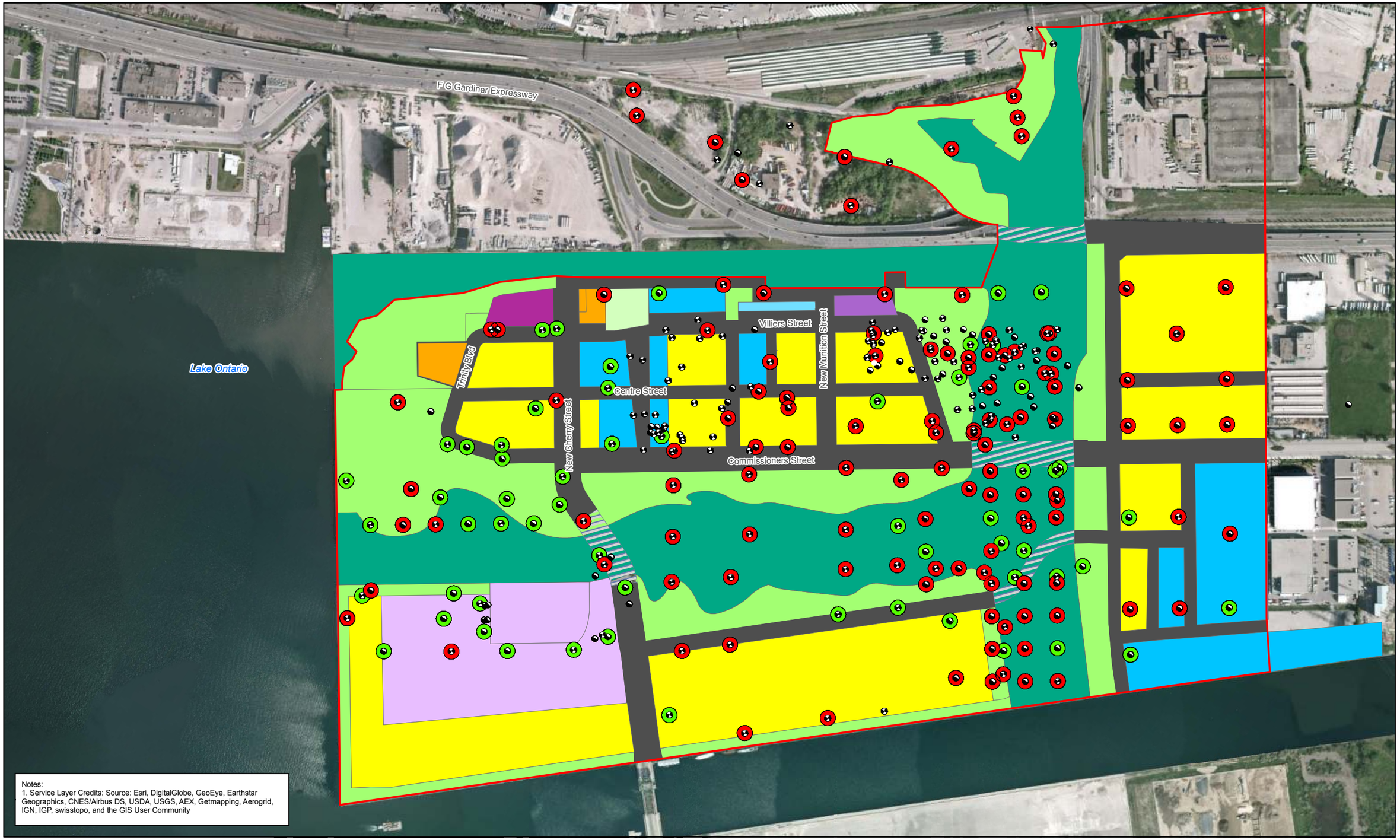
- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12G
Contaminant Distribution - Subsurface Soil (PHC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_PHC_SUBSURFACE.MXD RMACDONALD 1/7/2016 10:49:32 AM



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12H
Contaminant Distribution - Subsurface Soil (PAH)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_PAH_SUBSURFACE.MXD RMACDONALD 1/7/2016 11:01:57 AM

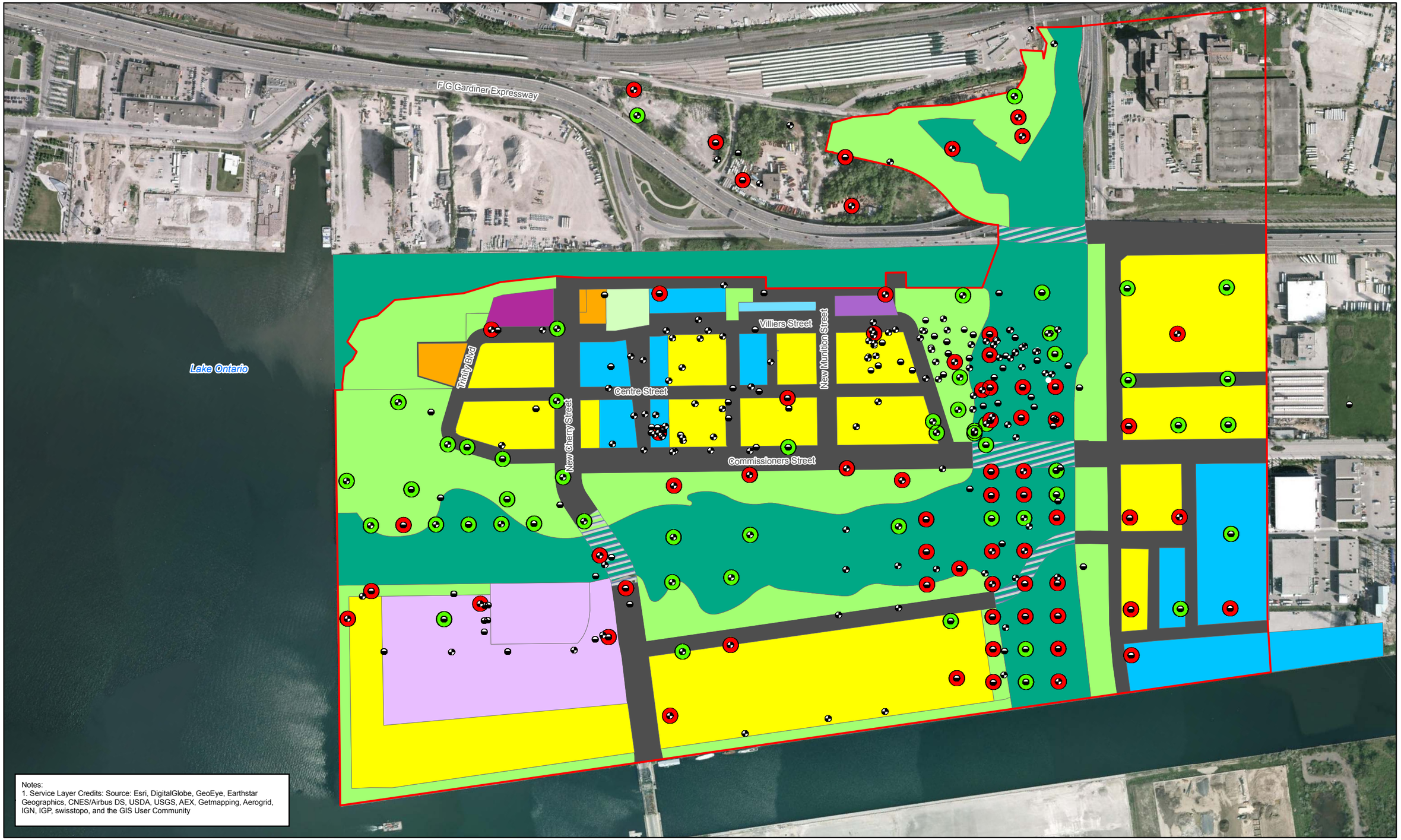
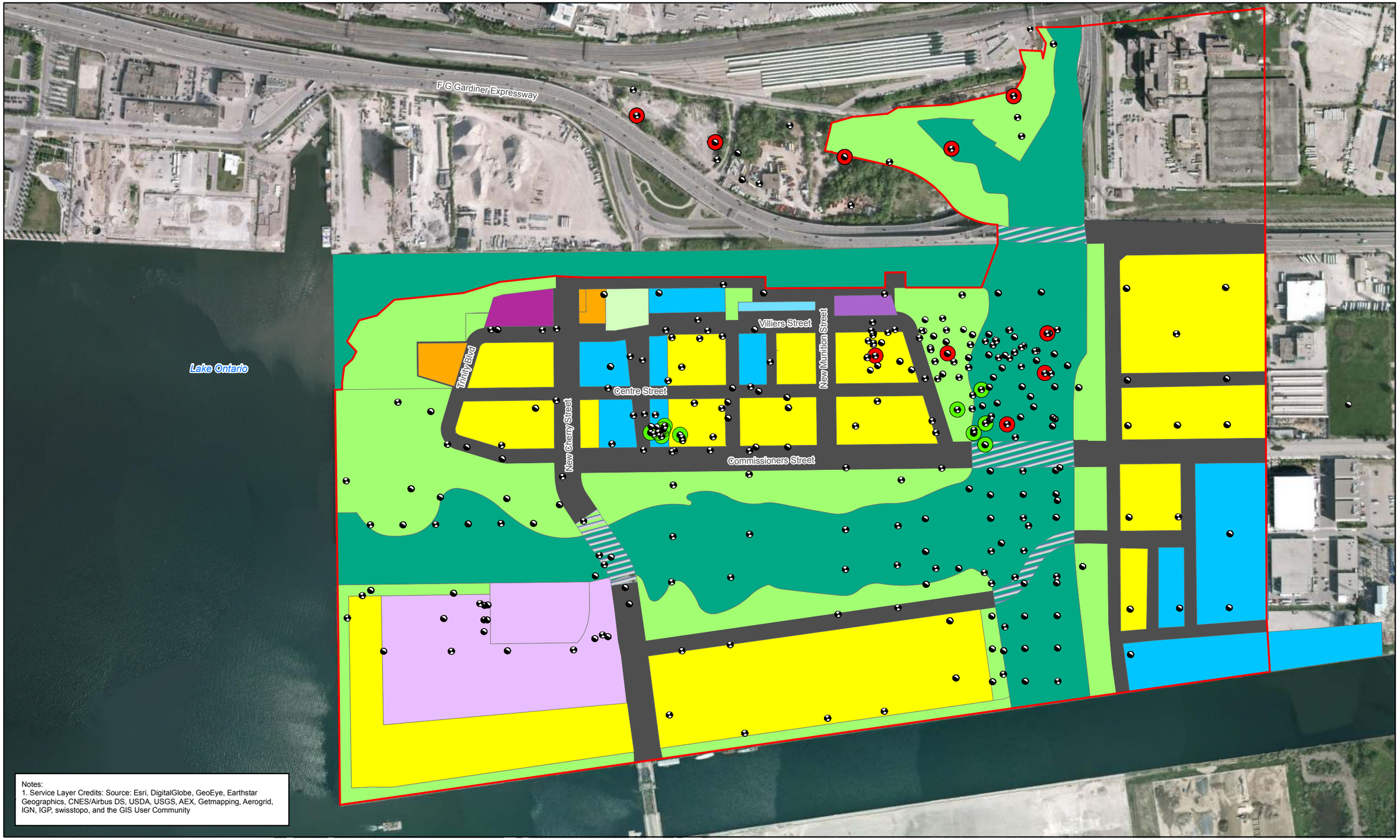


Figure 12I
Contaminant Distribution - Subsurface Soil (Metals & Inorganics)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_METALS_INORGANICS_SUBSURFACE.MXD ABATES1 1/8/2016 11:22:35 AM



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12J
Contaminant Distribution - Subsurface Soil (ABN, OCP, CP)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SO_ABN_OCP_CP_SUBSURFACE.MXD RMACDONALD 1/7/2016 11:51:52 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12K
Contaminant Distribution - Shallow Groundwater (VOC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_VOC_SURFACE.MXD RMACDONALD 1/7/2016 10:25:38 AM

Figure 12L
Contaminant Distribution - Shallow Groundwater (PHC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_PHC_SURFACE.MXD RMACDONALD 1/7/2016 10:28:36 AM

Figure 12M
Contaminant Distribution - Shallow Groundwater (PAH)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_PAH_SURFACE.MXD RMACDONALD 1/7/2016 11:05:05 AM

N

0 20 40 60 80

Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use

- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12N
Contaminant Distribution - Shallow Groundwater (Metals & Inorganics)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m.

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_METALS_INORGANICS_SURFACE.MXD RMACDONALD 1/7/2016 11:33:38 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 120
Contaminant Distribution - Bedrock Groundwater (VOC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_VOC_SUBSURFACE.MXD ABATES1 1/8/2016 11:23:54 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12P
Contaminant Distribution - Bedrock Groundwater (PHC)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_PHC_SUBSURFACE.MXD RMACDONALD 1/7/2016 10:28:00 AM

N

0 20 40 60 80

Metres

- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use

- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12Q
Contaminant Distribution - Bedrock Groundwater (PAH)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_PAH_SUBSURFACE.MXD RMACDONALD 1/7/2016 11:07:08 AM

Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

N

0 20 40 60 80
Metres

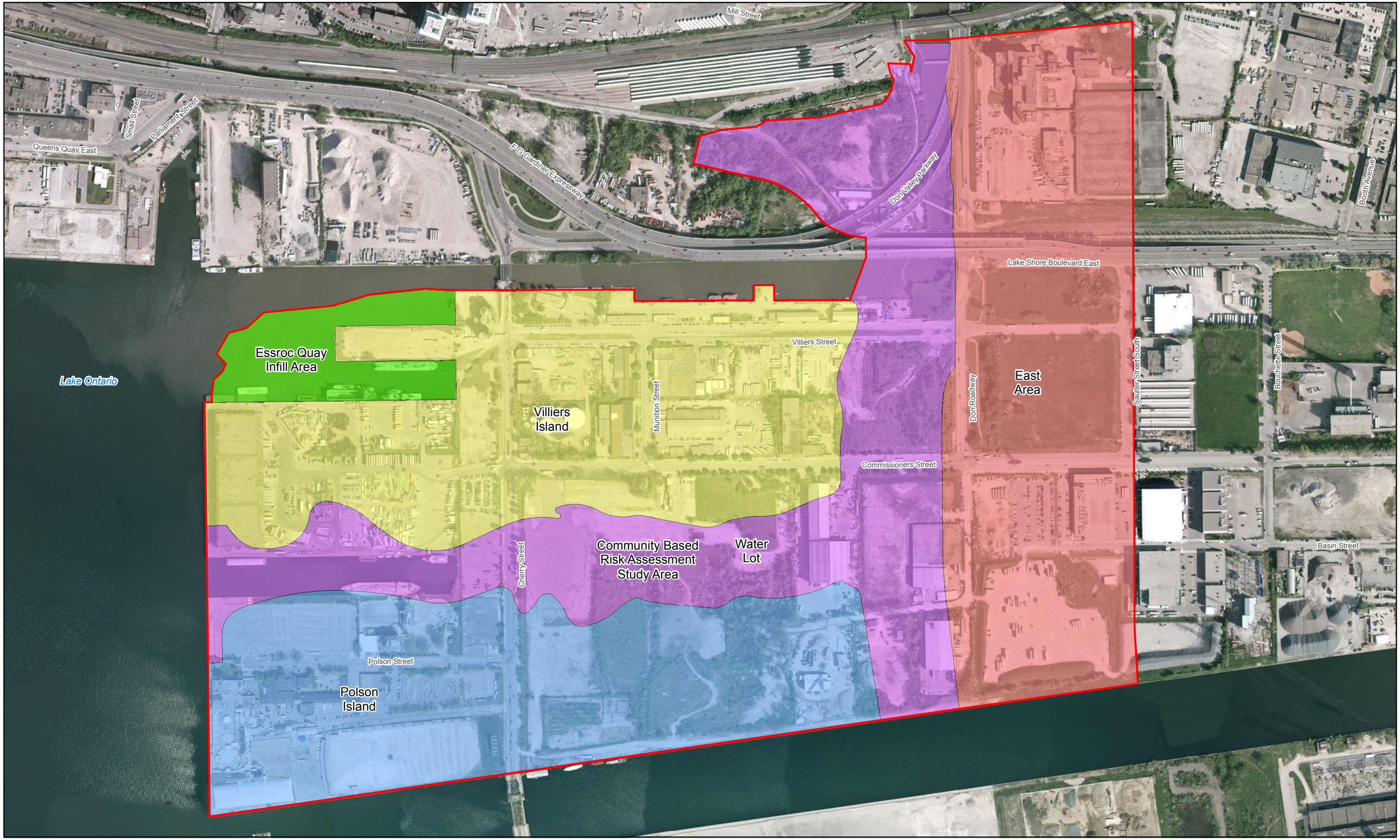
- Soil Sample
- Soil and Groundwater Sample
- Location Without Table 9 Exceedance
- Location With Table 9 Exceedance
- Community Based Risk Assessment Area

Future Land Use
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Road Area Above
- Naturalized Area

Figure 12R
Contaminant Distribution - Bedrock Groundwater (Metals & Inorganics)
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\GW_METALS_INORGANICS_SUBSURFACE.MXD RMACDONALD 1/7/2016 11:33:50 AM

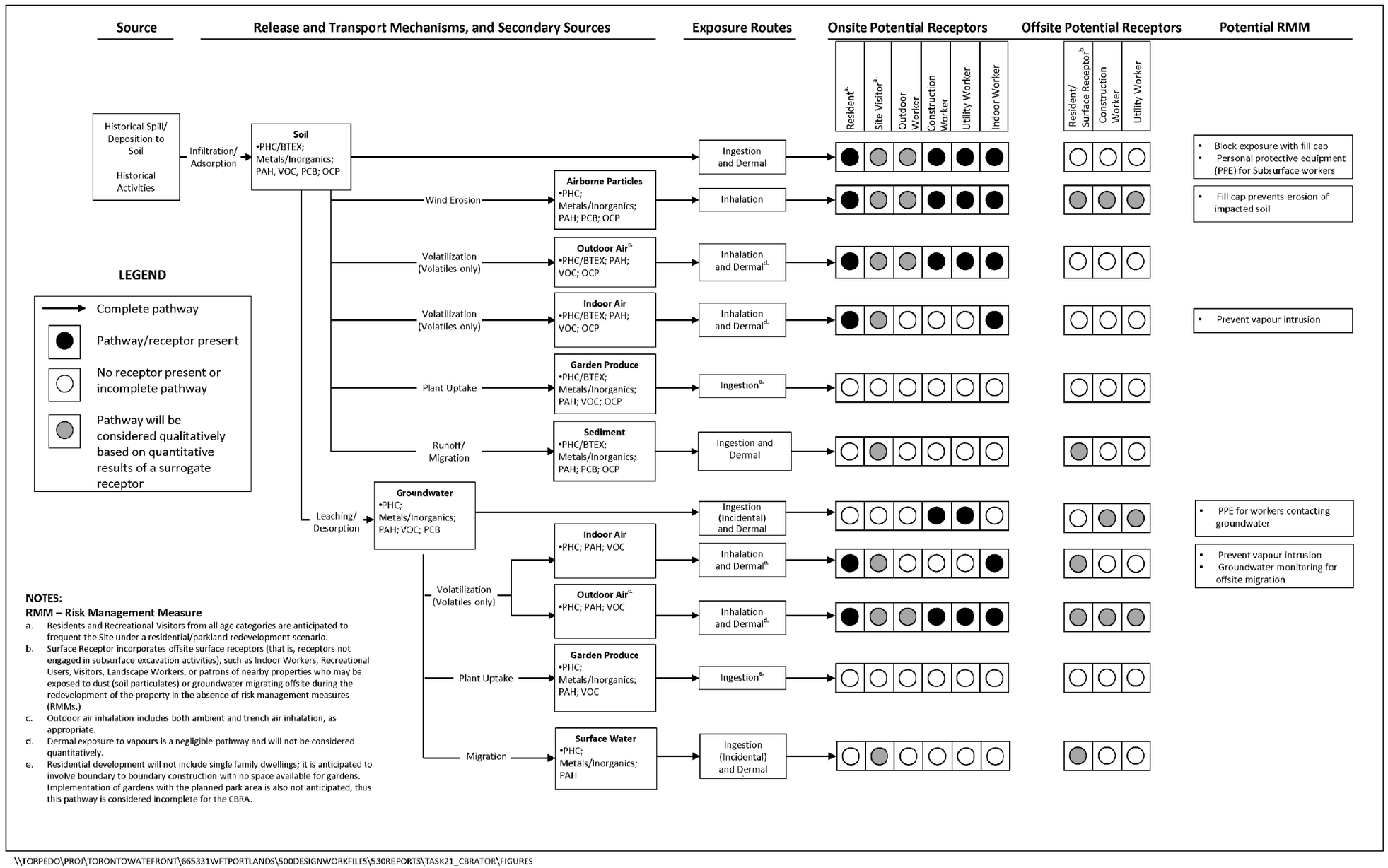


Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 13
Subareas for Community Based Risk Assessment
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\SUBAREAS.MXD ABATES1 1/8/2016 7:18:38 AM



\\TORPEDO\PROJ\TORONTOWATERFRONT\665331WFTPORTLANDS\500DESIGNWORKFILES\530REPORTS\TASK21_CBRATOR\FIGURES

Figure 14A
Preliminary Human Health Conceptual Site Model
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

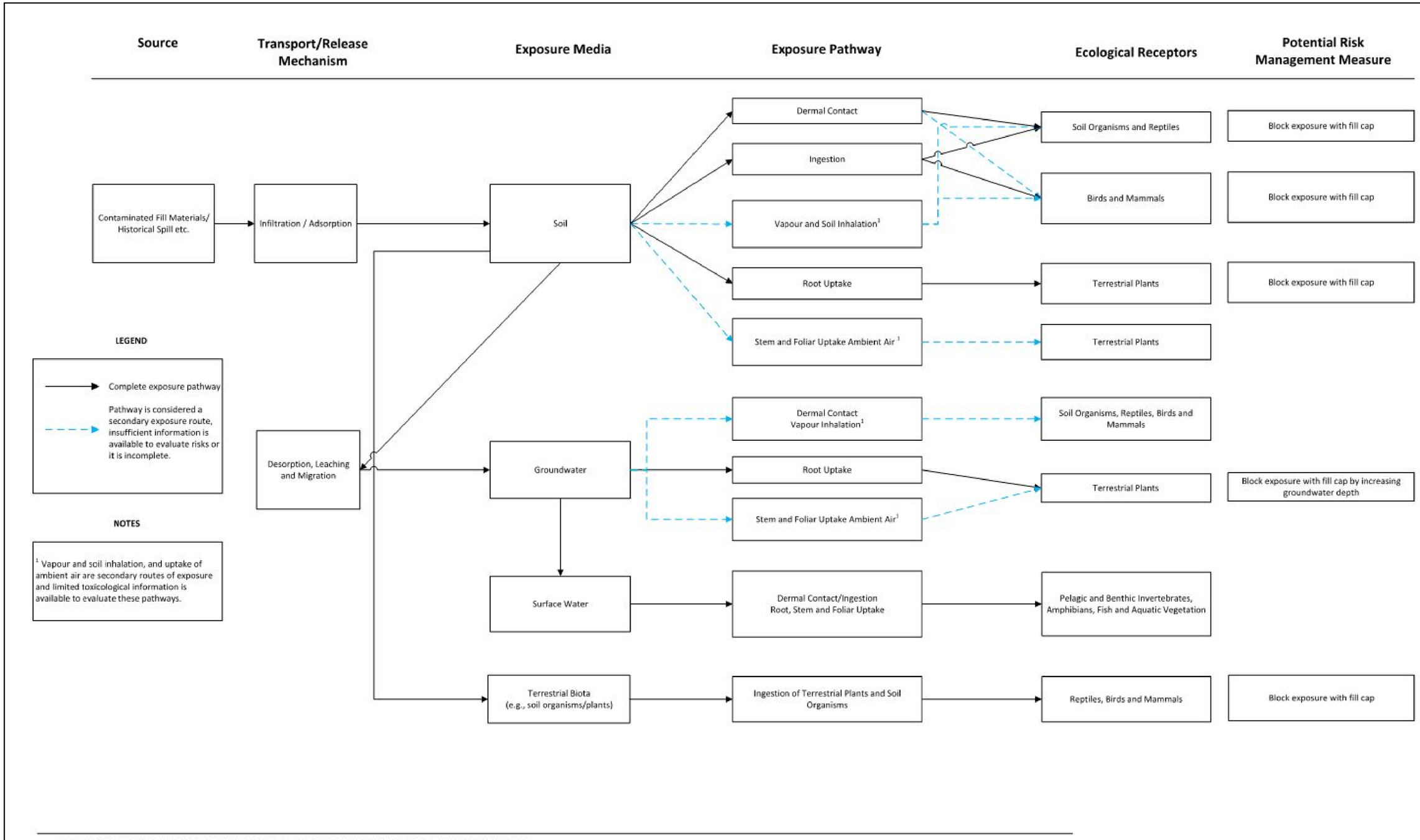
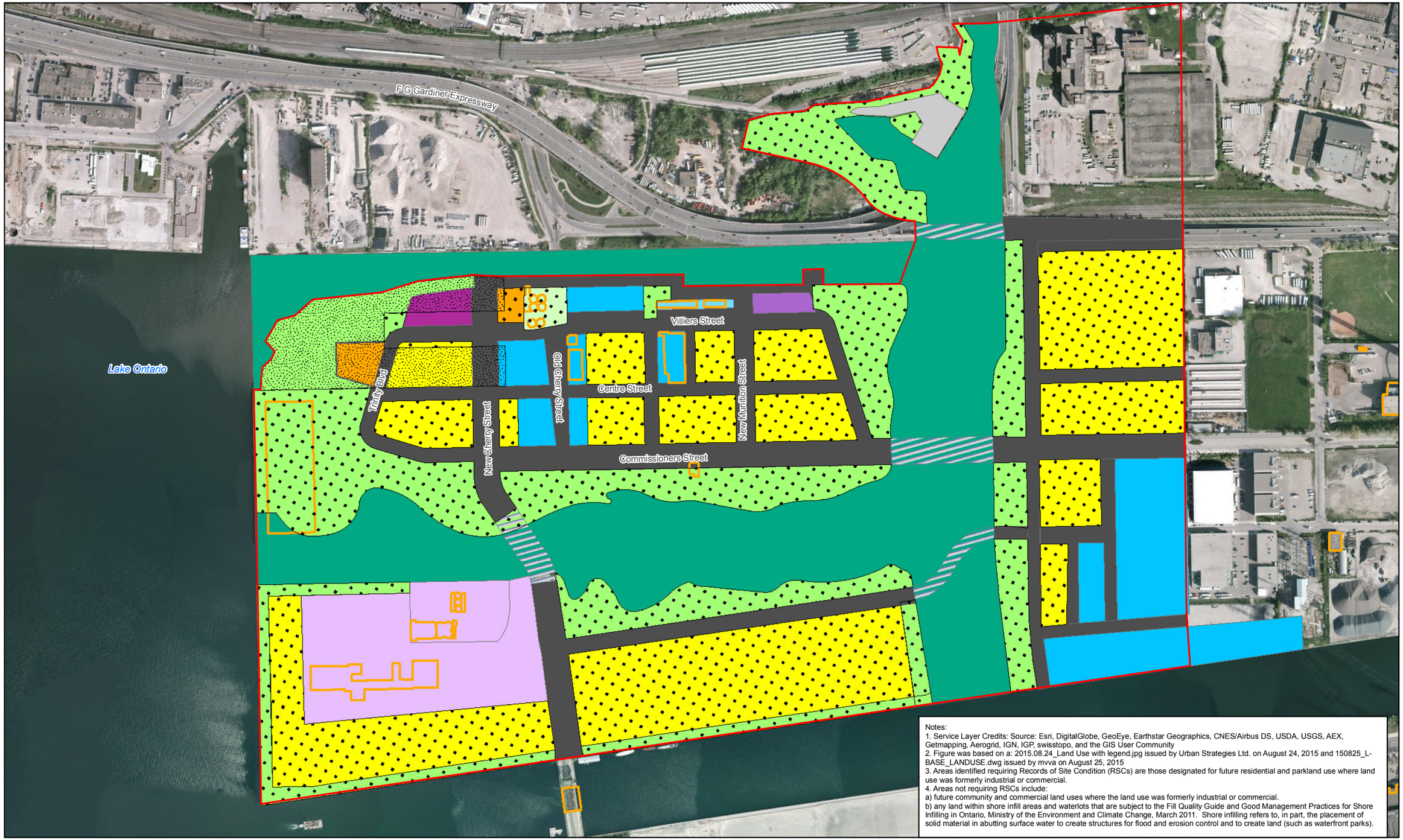


Figure 14B
Preliminary Ecological Conceptual Site Model
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario



Notes:
1. Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
2. Figure was based on a: 2015.08.24_Land Use with legend.jpg issued by Urban Strategies Ltd. on August 24, 2015 and 150825_L-BASE_LANDUSE.dwg issued by mvva on August 25, 2015
3. Areas identified requiring Records of Site Condition (RSCs) are those designated for future residential and parkland use where land use was formerly industrial or commercial.
4. Areas not requiring RSCs include:
a) future community and commercial land uses where the land use was formerly industrial or commercial.
b) any land within shore infill areas and waterlots that are subject to the Fill Quality Guide and Good Management Practices for Shore Infilling in Ontario, Ministry of the Environment and Climate Change, March 2011. Shore infilling refers to, in part, the placement of solid material in abutting surface water to create structures for flood and erosion control and to create land (such as waterfront parks).

N

0 20 40 60 80
Metres

- Community Based Risk Assessment Area
- Heritage Building
- Lake Fill
- Future LandUse
- Assumed Light Industrial
- Commercial/Community Facility
- Employment/Commercial
- Residential
- Catalytic Use
- Employment/Commercial/Heritage Structure
- Parkland
- Parkland/Heritage Structure
- Community Facility
- Roads
- Developed Area
- Developed Area Above
- Naturalized Area

Figure 15
Definition of RSC Areas
Community Based Risk Assessment Terms of Reference
Waterfront Toronto
Toronto, Ontario

ch2m

\\WATERLOO\GIS\PROJECTS\WT\GIS\MAPFILES\COMMUNITYRA\RSCAREAS.MXD CSENTES 1/25/2016 3:02:17 PM