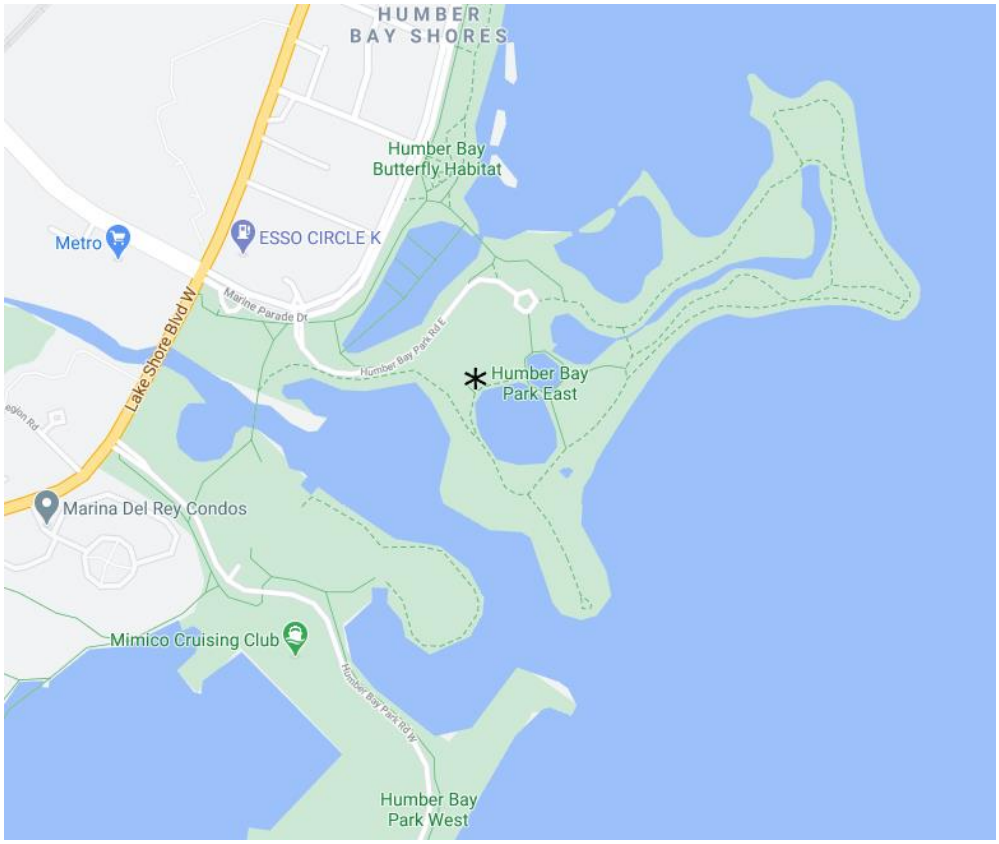
TORONTO

BACKGROUNDER

Humber Bay Park East Impacted Soils Discovery and Mitigation Report

Recently, as part of the Humber Bay Parks Master Plan Phase One Implementation in Humber Bay Park East, studies were undertaken to investigate the environmental quality of soil, groundwater, sediment and surface water in the project area for a proposed building and pond revitalization. Sampling commissioned by the City of Toronto revealed elevated levels of some substances when results were compared to standards established by the Ontario Ministry of the Environment, Conservation and Parks (MECP) for an urban park with water features. The substances identified at elevated levels were metals, petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).

There were concerns about potential for health risk to park users resulting from exposure to the substances found in the soil. To interpret the health risk, the City of Toronto, working with TRCA, commissioned a risk assessment to determine whether there are human or ecological health risks connected with exposures to the substances. The purpose of this backgrounder is to summarize the results of the environmental investigation and risk assessment, and inform decision-making related to project scope, execution, and risk management plans that can be incorporated into park features for the protection of the public, on-site workers and the environment. Hard surfacing and vegetation will mitigate exposure risk, in addition to recommended measures.



Location Plan of Humber Bay Park East

Objectives of the Risk Assessment

The objective of the risk assessment was to evaluate whether the elevated levels of substances pose health risks to human and ecological receptors associated with the improvement project at Humber Bay Park, that includes a new building, revitalized ponds and a linear wetland, boardwalk, and with walking paths throughout.

An aerial overview of the proposed improvements to Humber Bay Park.

Source and Distribution of Substances

The elevated levels of substances are mainly in the soil and sediment. The source is likely from the materials used in reclaiming the land to create the park. The regulations around environmental quality had not yet been established at the time of the construction of the park and there was less scientific knowledge about the effect of environmental contaminants on human and ecological health. Lakefill material has been known to include unsorted building debris from residential and industrial sites and can be contaminated with solvents, metals, salt and oils. The main substances identified in the samples collected during the environmental investigation were metals such as arsenic, cadmium and lead and

PAHs, such as anthracene, benzo[a]pyrene and fluoranthene. The levels of the substances vary, suggesting that the materials came from more than one location and may have included ash residues from coal and wood heating sources common in early Toronto and urban industrial areas. In general, no single substance was widespread and the highest levels are at only a few locations.

The impacts in groundwater were from chloride from the use of road salt and PAHs related to the poor-quality material used at the park. There is no exposure pathway for substances in groundwater to reach park users.

Surface water quality within the park ponds was consistent with that of Lake Ontario.

Exposure Assumptions

Different characteristics of park users were considered in the risk assessment (including recreational visitors such as adults and toddlers, City workers and other contractors), to capture the types of exposures that might be possible after park improvements are implemented. Also, the time frame in which exposures could occur were considered from short-term to long-term daily exposure conditions. To ensure a full range of possible exposures were captured, full-day visits several times each week by recreational visitors as well as possible exposures experienced by City staff working on site full-time and long-term were both considered. In cases where exposure conditions were not known, the risk assessment parameters were selected to over-predict the risk as a factor of safety.

For the ecological health risk assessment, groups of species that are native to the natural ecosystems of southern Ontario were selected to represent the diverse characteristics of the species expected at the park. Species were selected from those recommended by MECP as typical ecological species in southern Ontario.

Exposure estimates and protective health-based benchmarks that were used in the risk assessment were those endorsed by the Ontario MECP, Health Canada and United States Environmental Protection Agency (USEPA).

Risk Characterization

For human health, the risk assessment findings indicated that under the predicted conditions and exposure pathways, exposure to soils containing metals, PAHs, and PHCs poses a health concern to human receptors including park visitors, outdoor workers and subsurface workers.

For ecological health, the risk assessment predicted risks to on-site terrestrial plants, soil and sediment invertebrates, small mammals and birds.

Potential Risk Management Considerations

The findings of the risk assessment indicated that risk management measures can be implemented as part of the park revitalization to provide protection to park users from elevated substances in soil. Where there is impacted soil, potential exposures by both human and ecological receptors will be prevented by capping the impacted areas with a clean soil or hard cap. The makeup of acceptable caps could include the following:

- Clean soil underlain by a geotextile membrane for areas with plantings. The clean soil should be from 0.5 m to 1.5 m deep, depending on the expected root depth of the plantings.

- In areas with existing trees that will remain in place, a 10-cm layer of clean soil underlain by an open-weave geotextile membrane is recommended given that the existing trees appear to be thriving and attempts to install a deeper clean fill layer may result in injury to existing trees.
- Park features including hard surfaced walkways act as adequate barriers to prevent exposures from impacted soil.
- For pond areas, a barrier of a 20-cm layer of clean fill or river rock is recommended as a cap.

The combination of the identified risk management measures as part of the park improvement project will significantly reduce the risk to park users from exposure to substances at the project area.

A view of the proposed condition with an integrated landscape and building solution.

Humber Bay Park: Frequently Asked Questions (FAQ)

What are the origins of the parks, where and when and how were they built?
Humber Bay Parks East and West are located in Etobicoke South along the shore of Lake Ontario at the mouth of Mimico Creek. The park is accessed near the intersection of Lakeshore Boulevard West and Parklawn Road. These parks were constructed in the 1970s-80's, built jointly by Metropolitan Toronto and the Metro Toronto Region Conservation Authority (MTRCA) and opened to the public in 1984.

Like much of Toronto's Waterfront, these parks are "reclaimed land" with soil placed as lakefill material to extend the land further into the lake. This was undertaken during a time when there were different regulations related to soil movement, and the materials included in the lakefill, generally coming from urban excavation, were not monitored as they would be today. Since the time of construction, these parks have naturalized through the growth of plants, shrubs and trees, and are home to wildlife populations.

What is the plan for these parks?
In 2015-2016, Parks, Forestry and Recreation undertook a Master Plan for the parks. Phase One is currently underway, which includes replacement of service buildings and creation of indoor recreation space, and rehabilitation of the decorative ponds in the Humber Bay Park East to create new wetland habitat and an improved recreational pond.

In the implementation of the project, solutions for contaminated soil management are included through capping of soil in areas where there is a potential for exposure to park users. This practice will reduce the overall exposures by visitors of the park to substances that might remain beyond the project area.

What contaminants were discovered, and should we worry about them?
The substances identified in the soil and sediment investigation conducted as part of the improvement project include metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbon compounds (PHCs), volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs). These substances have not been measured in groundwater. The quality of surface water in the ponds is comparable to Lake Ontario water quality. People who may use the park may potentially encounter substances, through touching the soil and/or incidental ingestion via hand-to-mouth contact. As the park soil is mainly covered by vegetation or hard landscaping, it is anticipated that direct contact with impacted soil would be limited and would not likely lead to a health concern.

How widespread is the contamination expected to be? What are the soil conditions in the park outside of the defined boundaries of this project, and do I need to be concerned about them?
Although environmental impacts are present in soil across the investigated area, there are some areas with relatively low concentrations of substances and high concentrations are only observed in a few locations. This suggests that the soil brought to the park during construction came from different sources and no single substance is prevalent across the park. With the caps installed as part of the park improvement, the exposures and associated health risk to recreational park users and City workers will be prevented to levels acceptable to the MECP. Beyond the area of the work, hard surfacing and vegetation will mitigate potential exposure.

Are the contaminants manageable by adding a capping or another surface treatment to the soil?
The capping measures will prevent or block any potential for exposures to substances of concern. Park visitors are likely to be engaged in recreational activities such as running, biking or walking. Parks visitors will be discouraged from any activities that breach the capped surfaces at the park. As such, the capping measures will effectively block potential contact with impacted soil by park visitors. This is a management measure to reduce risk to levels that are acceptable to the MECP.

What more can we do to reduce risk?
There will be safety precautions required for workers during and after the construction project that will ensure protection of their health and safety. These precautions are focused on eliminating or limiting the potential for exposures to substances through dermal contact with soil, accidental ingestion of soil by hand-to-mouth and inhalation of dust.

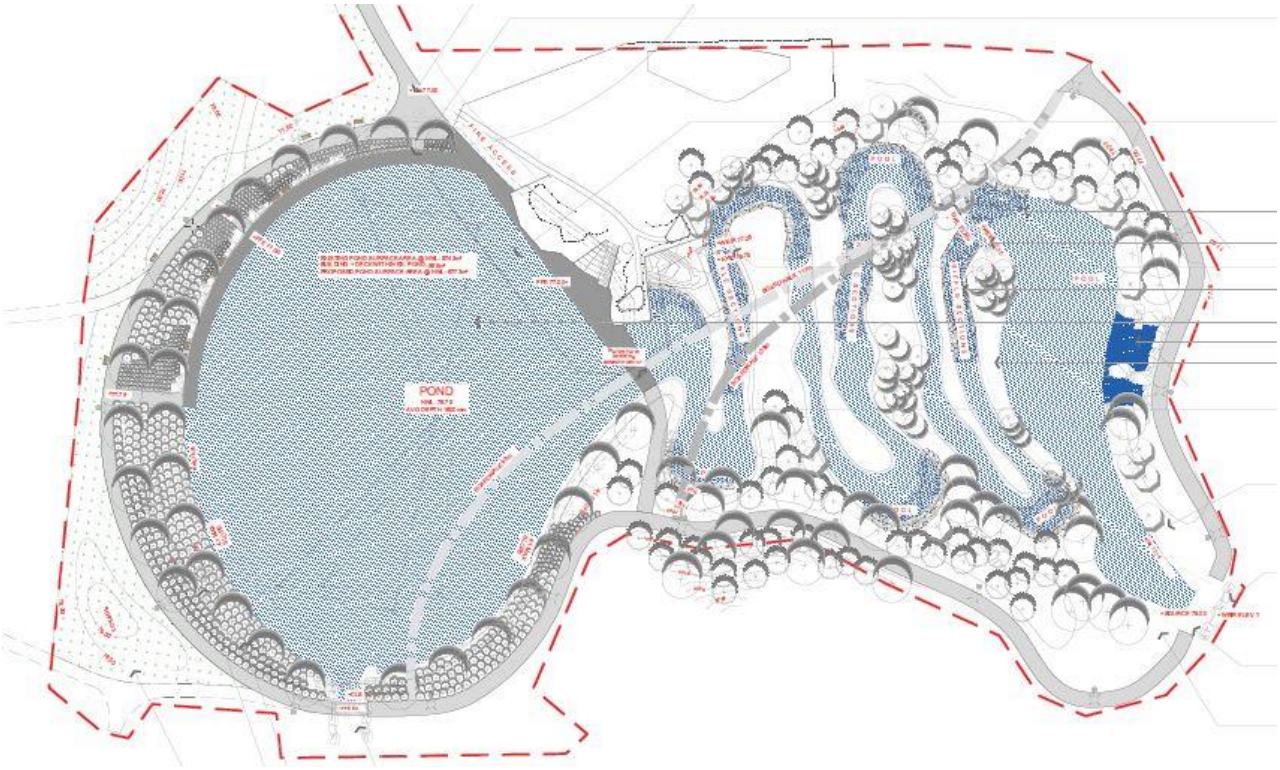
After the improvement project is completed, barriers on the ground surface will be in place to prevent or reduce the risk to acceptable levels for recreational park users. Although risks of exposure will be small, individuals may choose to consider additional measures such as staying on the trails as much as possible, not digging in the soil, washing hands after visiting the park and before eating, and removing your shoes at the door when you return home.

What more can be done to make the parks more safe?
The placement of the soil cap and hard landscaping surface barriers as part of the improvement project will manage the most significant risks. The health and safety measures by workers through the use of proper protective equipment and good hygiene by workers and park visitors will prevent exposures and provide added protection.

What can I do to make sure I do not come into contact with contaminated soils?
Within the area of the improvement project, caps have been installed as a barrier to contaminated soil. For areas beyond the improvement project, visitors to the park can reduce the time they are in contact with soil (e.g., avoid digging in the dirt with bare hands), clean any mud or dirt off shoes before leaving the park and leave your footwear at the door upon arrival home. Washing your hands when you arrive home or before eating should always be incorporated into your hygiene routine.

I've frequently visited the Parks for a long time. Should I be concerned for my health?
Because the substances of concern are not present uniformly across the park, and because visitors to the park will move across the park rather than stay at only one location, it is unlikely that recreational users will be exposed to impacted soil to a significant level.

Should I be concerned about the health of wildlife that lives or migrates through the parks?
While no specific wildlife studies occurred in relation to the soil contamination, the risk assessment evaluated potential exposures and risk to ecological receptors including wildlife typical of southern Ontario. The assessment findings indicated that the measures implemented in the improvement project will also reduce the risk to ecological health. To date, landscaping and restoration plantings have already increased natural cover size and distribution throughout the park however are facing increasing pressure from park use and invasive species. Nevertheless, there is a healthy and varied presence of both permanent and seasonal wildlife, which are adapted to the urban fabric, that will benefit from habitat improvements when the works are completed. The proposed pond restoration will contribute to improved wetland habitat connectivity and increased resilience to the effects of climate change.



The anticipated extent of the project work area.

A view of the proposed condition with an integrated landscape and building solution.