PROPOSED REMEDIAL ACTION PLAN

Robert Moses Parkway-South Site
State Superfund Project
Niagara Falls, Niagara County
Site No. 932166
February 2019

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

A public comment period has been set from: February 6 to March 8, 2019

A public meeting is scheduled for the following date: February 26, 2019

Public meeting location: De Veaux Woods State Park Office, Room 104
3180 De Veaux Woods Drive East
Niagara Falls, NY 14305

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through to:

Benjamin McPherson
NYS Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Ave
Buffalo, NY 14203-2915
benjamin.mcpherson@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: SITE DESCRIPTION AND HISTORY

Location: The Robert Moses Parkway-South Site is a 16.11-acre site located southwest of the intersection of John Daly Boulevard and Buffalo Avenue in the city of Niagara Falls. The site comprises the eastern end of Niagara Falls State Park, which is operated by NYS Office of Parks, Recreation, and Historic Preservation. The site is bounded to the north by Buffalo Avenue and Riverside Drive (beyond which are residential properties) and a hotel, to the east by New York Power Authority property, and to the south by the Niagara River. The Niagara Falls State Park parcel continues to the west of the site towards Goat Island.

Site Features: The site is bisected by the western lanes of the Niagara Scenic Parkway (formerly the Robert Moses Parkway). The site was recently redeveloped to improve pedestrian access to the Niagara River and replace the roadway. The redeveloped park includes open parkland, walking/biking paths, and portions of a man-made pond.

Current Zoning and Land Use: The site is currently part of Niagara Falls State Park and is zoned for such use. This portion of the park is intended for passive recreation. The surrounding properties are currently used for a combination of residential housing, parkland, commercial, industrial, and municipal uses.

Past Use of the Site: New York State has owned the property since 1885 when the Niagara Reservation was created to preserve the land surrounding Niagara Falls. The northeastern portion of the site historically contained the Port Day Pond, which was gradually filled starting in the 1930s. Southern portions of the site were created by the placement of large rock and other fill material into the Niagara River during the construction of the Robert Moses Power Project in the 1960s. Contamination in the former pond area was initially discovered in 2013 prior to the reconfiguration the Robert Moses Parkway interchange. Additional areas of contamination were discovered in 2015 during utility installation and site grading work south of the former Robert Moses Parkway.

Site Geology and Hydrogeology: North of the former Robert Moses Parkway, overburden soil consists of reworked soil composed of silt, sand, gravel, and clay followed by silt and clay or silt and fine sand in the underlying native soil. In the former Port Day Pond footprint, the upper reworked soil is underlain with miscellaneous fill (including ash, bottles, glassware, and scrap metal) followed by former pond sediment on top of bedrock. Depth to bedrock varies, but is typically 10 to 15 feet below ground surface. South of the former Robert Moses Parkway, the overburden soil typically consists of a thin layer of topsoil underlain by soil fill, which is underlain by large rock fill. Depth to the rock fill layer varies, but is typically 8 to 13 feet below ground surface. Bedrock is present beneath the rock layer.

Overburden groundwater flow is to the north or northeast, away from the Niagara River. Overburden groundwater elevations appear to be influenced strongly by the Niagara River stage. During construction excavations it was observed that Niagara River water flows through the shot-rock fill in the southern portions of the site.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which permits passive recreational use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

NYS Office of Parks, Recreation, and Historic Preservation

The Department and NYS Office of Parks, Recreation, and Historic Preservation entered into a Consent Order on January 15, 2015. The Order obligates the responsible party to implement a RI/FS only. After the remedy is selected, the Department will approach the PRPs to implement the selected remedy. If an agreement cannot be reached with the PRPs, the Department will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- groundwater
- soil

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that

are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

alpha-BHC	aldrin
beta-BHC	mercury
hexachlorobenzene	arsenic
1,2,4,5-tetrachlorobenzene	

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

The following IRM(s) has/have been completed at this site based on conditions observed during the RI.

Construction Zone IRM

Excavation and off-site disposal of waste and contaminated soil from areas in the Riverway Construction Zone. The contamination was addressed as an IRM to allow for continued construction of park and road improvements. The IRM was expanded to include a portion of the former Port Day Pond. The major components of the IRM included:

- Excavation and off-site disposal of approximately 236 tons of surface soil contaminated by arsenic which exceeded commercial soil cleanup objectives (CSCOs) from the northern border of the site;

- Excavation and off-site disposal of approximately 2,800 tons of soil containing pesticide/organochlorine wastes, which exceeded CSCOs, or exhibited nuisance conditions from the former Port Day Pond and Hot Spots 1/3, 2, 4, 4a, and 6. The excavated material was disposed off-site as hazardous waste. CSCOs for pesticides and/or semi-volatile organic compounds (SVOCs) were not achieved in Hot Spots 1/3, 2, and a portion of 4. These remaining areas will be addressed as part of the final site remedy;
- Excavation and off-site disposal of 1.38 tons of solid or semi-solid hazardous substances (pesticide wastes and chlorinated organics), including remnants of drums, from utility trenches and paving areas in Hot Spots 1, 2, and 3. CSCOs for pesticides and SVOCs were not achieved in these areas;
- Excavation and off-site disposal of approximately 29,300 tons of residually impacted soil as solid waste. This soil was generated from Hot Spot 5, segregation of material from other hot spots, and general site grading activities; and
- Backfill of excavation areas to meet design grades with approved soil/fill that allows for commercial use; and
- Construction of covers in Hot Spots 1 and 3, Hot Spot 2, and a portion of Hot Spot 4 south of the AT&T fiber optic line where residual contamination remains exceeding the CSCOs. The cover in these areas consist of either asphalt, concrete, or soil cover. Where a soil cover is used it is a minimum of one foot of soil placed over a demarcation layer.

The IRM excavations were completed in several stages between June 2016 and November 2017. These IRM activities are documented in the IRM Construction Completion Report dated January 2019.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for the site.

The RI for the site is complete. Surface soil, subsurface soil, and groundwater samples were analyzed for volatile organic compounds (VOCs), SVOCs, polychlorinated biphenyls (PCBs), pesticides, and metals. Based on these results, the primary contaminants of concern for the site include aldrin, alpha-hexachlorocyclohexane (alpha-HCH or alpha-BHC), beta-hexachlorocyclohexane (beta-HCH or beta-BHC), hexachlorobenzene, arsenic, mercury, and 1,2,4,5-tetrachlorobenzene. Limited arsenic impacts were identified in on-site surface soils, but are not attributed to waste disposal at the site. The IRM activities have addressed the majority of the contamination encountered during park and roadway reconstruction. The contamination remaining at the site is as follows:

Surface Soil (0-2 inch): Contaminants of concern have been detected in surface soil but none at levels exceeding commercial use SCOs.

Subsurface Soil: Contaminants of concern detected exceeding commercial use SCOs include aldrin (up to 1.07 parts per million (ppm), CSCO 0.68 ppm), alpha-BHC (up to 26.4 ppm, CSCO 3.4 ppm), and beta-BHC (up to 6.75 ppm, CSCO 3 ppm), hexachlorobenzene (up to 18.5 ppm, CSCO 6 ppm), arsenic (up to 46.5 ppm, CSCO 16 ppm), and mercury (up to 4.03 ppm, CSCO 2.8 ppm). The SVOC 1,2,4,5-tetrachlorobenzene (up to 28.3 ppm) was detected but does not have a promulgated SCO. Subsurface arsenic contamination is not widely distributed and is not related to the hazardous waste disposed of at the site.

On-site contamination was primarily located in distinct areas where hazardous waste substances were used to fill in portions of the Niagara River or the former Port Day Pond. These areas were typified by the presence of metal drum carcasses, suspected process solids with strong chemical odors, or contaminated soil. RI and IRM data does not indicate the potential for any off-site impacts to soil related to waste disposal at the site.

Groundwater: Contaminants of concern detected exceeding groundwater quality standards (GWQS) in unfiltered samples include alpha-BHC (up to 1.83 parts per billion (ppb), GWQS 0.01 ppb), beta-BHC (up to 1.08 ppb, GWQS 0.04 ppb), and mercury (up to 1.41 ppb, GWQS 0.7 ppb). Turbid groundwater samples collected shortly after the completion of the IRM contained numerous exceedances of various pesticides, SVOCs, and metals, but are likely not representative of actual groundwater concentrations. In subsequent filtered groundwater samples only alpha-BHC (up to 0.164 ppb, GWQS 0.01 ppb) and beta-BHC (up to 1.13 ppb, GWQS 0.04 ppb) were detected exceeding GWQS. Concentrations of alpha-BHC and beta-BHC were significantly lower in the filtered samples in most monitoring wells.

Monitoring wells where alpha-BHC and beta-BHC continue to be detected above GWQS are located in the vicinity of former contamination hotspots. It is anticipated that groundwater concentrations will decrease over time since the completion of the IRM. Groundwater is not used as a source of potable water by the surrounding area. Off-site groundwater impacts related to the site have not been documented.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure.*

People will not come into contact with site-related soil and groundwater contamination unless they dig below the surface. People are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in the soil or groundwater may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. The process which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Because the site is vacant, inhalation of site contaminants, due to soil vapor intrusion does not represent a current concern. The potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.

Soil Vapor

RAOs for Public Health Protection

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or

monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the Site Management remedy. This remedy includes the elements of the IRM already completed, as described in Section 6.2.

The estimated present worth cost to implement the remedy is $114,000. The cost to implement the remedy is estimated to be $45,000 and the estimated average annual cost is $3,500.

The elements of the proposed remedy are as follows:

1. Green Remediation

Green remediation principals and techniques will be implemented to the extent feasible in the site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste.

2. Institutional Controls

Imposition of an institutional control in the form of a declaration of covenants and restrictions for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial use, which would also allow for passive recreational use, as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

3. Site Management Plan

A Site Management Plan is required, which includes the following:

a. an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The declaration of covenants and restrictions discussed in remedial element 2.

Engineering Controls: The soil covers discussed in Section 6.2, above.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a description of the provisions of the declaration of covenants and restrictions including any land use or groundwater use restrictions;
- a provision for evaluation of the potential for soil vapor intrusion for any future occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

b. a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion for any future buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into four categories: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/polychlorinated biphenyls (PCBs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Groundwater

Groundwater samples have been collected from nine overburden monitoring wells. The original RI samples were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals to assess on-site groundwater conditions. Slow recovery and highly turbid samples typified these monitoring wells, suggesting that the overburden is not a significant source of groundwater. Two sampling events have been conducted since the IRM completion. The results of these events are summarized in Table 1 and discussed below.

The primary contaminants of concern in groundwater are alpha-BHC and beta-BHC. Monitoring wells where these contaminants exceed their respective SCGs are generally located in the vicinity of waste areas that were addressed during the IRM (see Section 6.2). It is anticipated that groundwater quality will improve over time due to the removal of contaminated material. The location of monitoring wells and the most recent sampling results are summarized on Figure 2.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)	SCG (ppb)	Frequency Exceeding SCG
Metals NYS CLASS GA			
Chromium, Total	2.81-71.8	50	1/5
Iron	116-40,900	300	4/5
Lead	0.450-303.7	25	4/5
Magnesium	25,900-272,000	35000	2/5
Manganese	6.40-2,340	300	4/5
Mercury	ND-1.41	0.7	1/5
Selenium	ND-20.0	10	2/5
Sodium	5,300-29,900	20000	2/5
Pesticides/PCBs NYS CLASS GA			
Alpha-BHC (Alpha Hexachlorocyclohexane)	ND-1.83	0.01	6/17
Beta-BHC (Beta Hexachlorocyclohexane)	ND-1.13	0.04	10/17
Delta-BHC (Delta Hexachlorocyclohexane)	ND-0.0180	0.04	0/17

Detected Constituents	Concentration Range Detected (ppb)	SCG (ppb)	Frequency Exceeding SCG
Dieldrin	ND-0.04	0.004	2/17
Gamma-BHC (Lindane)	ND-0.0220	0.05	0/17
SVOC NYS CLASS GA			
Benzo(A)Anthracene	ND-0.620	0.002	4/5
Benzo(A)Pyrene	ND-0.720	0	1/5
Benzo(B)Fluoranthene	ND-1.00	0.002	4/5
Benzo(K)Fluoranthene	ND-0.360	0.002	1/5
Chrysene	ND-0.600	0.002	3/5
Indeno(1,2,3-C,D)Pyrene	ND-0.600	0.002	2/5
VOC NYS CLASS GA			
None Detected Above Standards			

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).

During the first event unfiltered groundwater samples were collected from five monitoring wells and were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. No VOCs or PCBs were detected exceeding SCGs. The SVOCs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-c,d)pyrene were detected above their respective SCGs in at least one well. The pesticides alpha-BHC, beta-BHC, and dieldrin were detected exceeding their respective SCG in at least two wells. The metals aluminum, chromium (total), iron, lead, magnesium, manganese, mercury, selenium, and sodium were detected above their respective SCGs in at least one well.

During the second event unfiltered and filtered groundwater samples were collected from six monitoring wells and were analyzed for pesticides. In both the unfiltered and filtered samples alpha-BHC was detected exceeding its SCG in two wells and beta-BHC was detected exceeding its SCG in three wells. Filtered alpha-BHC and beta-BHC concentrations were lower than the corresponding unfiltered samples, and were generally lower than the concentrations observed during the previous sampling event. No other pesticides were detected exceeding SCGs.

The metals and SVOCs detected in unfiltered groundwater samples are not considered site specific contaminants of concern. Aluminum, iron, magnesium, manganese, and sodium are naturally occurring elements and likely represent local background levels. Chromium, lead, selenium, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-c,d)pyrene are not the major constituents detected in the waste material disposed at the site. Given the turbidity of the groundwater samples and the historic anthropogenic fill near the site, these contaminants are likely associated with suspended soil particles and are not considered site specific contaminants of concern. While mercury is a contaminant of concern in subsurface soil, it has not been consistently detected in groundwater and is not considered a contaminant of concern in groundwater. The single detection of mercury exceeding the SCG is attributed to the turbidity of the sample, as the same monitoring well reported mercury as non-detect during the RI.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: alpha-BHC and beta-BHC.

Soil

Surface and subsurface soil samples were collected at the site during the RI and IRM. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from a depth of less than 1 foot to 14 feet below ground surface to determine the extent of waste disposed of at the site. Soil samples collected during the RI were analyzed for VOCs, SVOCs, pesticides, PCBs, and metals. Additional samples to delineate areas of contamination were sampled for a reduced analyte list reflective of the contamination present. This typically included SVOCs, pesticides, and/or mercury.

Post-IRM results indicate that two samples of on-site surface soil exceed the unrestricted and restricted use SCGs for copper and benzo(a)pyrene. Post-IRM results indicate that on-site subsurface soil exceeds the unrestricted and restricted use SCGs for certain VOCs, SVOCs, pesticides, and metals (detailed below). Surface soil sample locations are shown on Figure 3, subsurface soil sample locations are shown on Figure 4. The post-IRM surface and subsurface soil sampling results are summarized in Table 2 and Table 3, respectively.

Table 2 - Surface Soil (0-2")

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG (ppm)	Frequency Exceeding Unrestricted Use SCG[b]	Restricted Use SCG (ppm)	Frequency Exceeding Restricted Use SCG[c]
Metals PART 375					
Arsenic	2.05 - 15.8	13	7/41	16	0/41
Copper	9.39 - 1970	50	1/11	270	1/11
Lead	20.8 - 120	63	3/11	1000	0/11
Mercury	0.0755 - 0.837	0.18	6/11	2.8	0/11
Nickel	9.41 - 96.4	30	1/11	310	0/11
Selenium	1 - 5.34	3.9	3/11	1500	0/11
Zinc	49.9 - 366	109	7/11	10,000	0/11
Pesticides/PCBs PART 375					
Aldrin	0.0106 - 0.0283	0.005	2/11	0.68	0/11
Alpha-BHC (Alpha Hexachlorocyclohexane)	0.002 - 0.275	0.02	6/11	3.4	0/11
Beta-BHC (Beta Hexachlorocyclohexane)	0.004 - 1.67	0.036	5/11	3	0/11
Delta-BHC (Delta Hexachlorocyclohexane)	0.00209 - 0.0477	0.04	1/11	500	0/11
P,P'-DDD	0.0025 - 0.0111	0.0033	1/11	92	0/11
P,P'-DDE	0.0012 - 0.0242	0.0033	3/11	62	0/11
P,P'-DDT	0.00272 - 0.0156	0.0033	4/11	47	0/11
SVOC PART 375					
Benzo(A)Anthracene	0.229 - 1.38	1	1/11	500	0/11
Benzo(A)Pyrene	0.0918 - 1.4	1	1/11	1	1/11
Benzo(B)Fluoranthene	0.11 - 1.32	1	1/11	500	0/11
Benzo(K)Fluoranthene	0.177 - 1.1	0.8	1/11	500	0/11
Chrysene	0.24 - 1.45	1	1/11	5.6	0/11

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG (ppm)	Frequency Exceeding Unrestricted Use SCG[b]	Restricted Use SCG (ppm)	Frequency Exceeding Restricted Use SCG[c]
Dibenz(A,H)Anthracene	0.11 - 0.361	0.33	1/11	5.6	0/11
Indeno(1,2,3-C,D)Pyrene	0.18 - 0.646	0.5	2/11	500	0/11
1,2,4,5-Tetrachlorobenzene	0.466 - 0.466	N/A	-	N/A	-
VOC PART 375					
Hexachlorobenzene	0.252 - 1.23	0.33	1/11	6	0/11

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial

Surface soil contamination identified during the RI was addressed during the IRM described in Section 6.2. The singular detections of benzo(a)pyrene and copper exceeding restricted use SCG are not considered contaminants of concern as they are not related to hazardous waste disposal at the site. However, it should be noted that the area of these exceedance has been covered due to the presence of contaminants of concern exceeding restricted use SCGs in subsurface soil.

Surface soil contamination by contaminants of concern does not remain at the site. Therefore, no remedial alternatives need to be evaluated for surface soil.

Table 3 – Subsurface Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG (ppm)	Frequency Exceeding Unrestricted Use SCG[b]	Restricted Use SCG (ppm)	Frequency Exceeding Restricted Use SCG[c]
Metals PART 375					
Arsenic	0.984 - 32	13	3/53	16	2/53
Cadmium	0.165 - 4.91	2.5	5/53	9.3	0/53
Copper	6.58 - 117	50	6/36	270	0/36
Lead	4.55 - 3330	63	13/53	1000	2/53
Mercury	0.00805 - 3.69	0.18	32/61	2.8	2/61
Nickel	5.91 - 45.5	30	5/36	310	0/36
Zinc	41.4 - 1520	109	23/36	10000	0/36
Pesticides/PCBs PART 375					
Aldrin	0.00176 - 1.07	0.005	24/81	0.68	3/81
Alpha-BHC (Alpha Hexachlorocyclohexane)	0.00178 - 26.4	0.02	43/81	3.4	4/81
Beta-BHC (Beta Hexachlorocyclohexane)	0.0022 - 6.75	0.036	36/81	3	4/81
cis-Chlordane	0.00235 - 0.105	0.094	1/81	24	0/81
Delta-BHC (Delta Hexachlorocyclohexane)	0.00204 - 0.202	0.04	9/81	500	0/81

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted Use SCG (ppm)	Frequency Exceeding Unrestricted Use SCG[b]	Restricted Use SCG (ppm)	Frequency Exceeding Restricted Use SCG[c]
Dieldrin	0.00223 - 0.066	0.005	9/81	1.4	0/81
Endrin	0.00168 - 0.187	0.014	18/81	89	0/81
Heptachlor	0.00187 - 0.0761	0.042	5/81	15	0/81
P,P'-DDD	0.00168 - 0.12	0.0033	23/81	92	0/81
P,P'-DDE	0.0018 - 0.0519	0.0033	5/81	62	0/81
P,P'-DDT	0.00188 - 0.123	0.0033	16/81	47	0/81
SVOC PART 375					
1,2,4,5-Tetrachlorobenzene	0.466 - 0.466	N/A	-	N/A	-
Benzo(A)Anthracene	0.15 - 4.2	1	6/75	5.6	0/75
Benzo(A)Pyrene	0.12 - 2.5	1	5/75	1	5/75
Benzo(B)Fluoranthene	0.11 - 2.9	1	5/75	5.6	0/75
Benzo(K)Fluoranthene	0.254 - 1.58	0.8	5/75	56	0/75
Chrysene	0.11 - 3.3	1	5/75	56	0/75
Dibenz(A,H)Anthracene	0.12 - 0.422	0.33	1/75	0.56	0/75
Indeno(1,2,3-C,D)Pyrene	0.14 - 2.5	0.5	4/75	5.6	0/75
VOC PART 375					
Acetone	0.01 - 0.359	0.05	9/50	500	0/50
Hexachlorobenzene	0.13 - 18.5	0.33	23/75	6	4/75

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial

Subsurface soil contamination identified during the RI was partially addressed during the IRM described in Section 6.2. After the IRM, subsurface soil contamination exceeding the restricted use SCG remains in Hot Spots 1/3, Hot Spot 2, a small portion of Hot Spot 4, and in four RI sample locations.

The primary subsurface soil contaminants of concern are aldrin, alpha-BHC, beta-BHC, hexachlorobenzene, 1,2,4,5-tetrachlorobenzene, and mercury related to the disposal of lindane (gamma-BHC) or other chlorinated organic production waste. Waste materials and contaminated soil were encountered in four general subsurface areas, as shown on Figure 4. After the IRM, soil containing at least one of these contaminants above the restricted use SCGs remains below grade in Hot Spots 1/3, Hot Spot 2, and a portion of Hot Spot 4. As part of the completed IRM, cover material meeting the restricted use SCGs was placed over the remaining contamination in these locations.

Prior to the RI, sample results from Boring 8 (B8) detected alpha-BHC and beta-BHC exceeding their restricted use SCGs. Four delineation samples were collected surrounding this location during the RI, and results for alpha-BHC and beta-BHC were all below the restricted use SCGs. It was determined that further remediation of this soil boring was not necessary.

Ash fill mixed with municipal garbage (bottles, glassware, wood, scrap metal, etc.) was identified in seven test pits located in the northern portion of the site (in the vicinity of the former Port Day Pond). Two of these locations exceed the restricted use SCGs for arsenic and lead, with an additional location exceeding the restricted use SCG for benzo(a)pyrene. Given the low frequency of exceeding restricted use SCGs, depth of the fill material, and limited detections of the hazardous waste constituents, these contaminants are not considered related to the disposal of hazardous waste at the site and are not contaminants of concern at the site.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of subsurface soil. The site contaminants identified in subsurface soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are: aldrin, alpha-BHC, beta-BHC, 1,2,4,5-tetrachlorobenzene, hexachlorobenzene, and mercury. Most of the contamination present at the site has been addressed by the IRM described in Section 6.2.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Further Action

The No Further Action Alternative recognizes the remediation of the site completed by the IRM(s) described in Section 6.2. This alternative leaves the site in its present condition and does not provide any additional protection of the environment.

Alternative 2: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative would include: excavation and off-site disposal of approximately 250,000 cubic yards of waste and soil contamination above the unrestricted soil cleanup objectives. The remedy will not rely on institutional or engineering controls to prevent future exposure. There is no site management, no restrictions, and no periodic review. This remedy will have no annual cost, only the capital cost of excavation.

Capital Cost:.....*$91,500,000*

Alternative 3: Excavation to Achieve Commercial Use

This alternative would include, the remediation of the site completed by the IRM described in Section 6.2 (excluding placement of cover material) and the additional excavation of approximately 6,000 cubic yards of soil exceeding commercial use SCOs. This alternative includes institutional controls, in the form of a declaration of covenants and restrictions, and a site management plan for the management of soil and groundwater remaining above unrestricted use SCGs.

Present Worth:.....*$2,390,000*
Capital Cost:.....*$2,260,000*
Annual Costs:.....*$3,500*

Alternative 4: Site Management

This alternative acknowledges the remediation of the site pursuant to the IRM described in Section 6.2 to allow for commercial/passive recreational use of the site. Site Management and Institutional Controls are necessary to confirm the effectiveness of this remedy. This alternative includes institutional controls, in the form of a declaration of covenants and restrictions, and a site management plan for the management of soil and groundwater remaining above unrestricted use SCGs.

Present Worth:.....*$114,000*
Capital Cost:.....*$45,000*
Annual Costs:.....*$3,500*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
1. No Further Action	0	0	0
2. Restoration to Pre-Disposal Conditions	91,500,000	0	91,500,000
3. Excavation for Commercial Use	2,260,000	3,500	2,390,000
4. Site Management	45,000	3,500	114,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, Site Management as the remedy for this site. Alternative 4 would achieve the remediation goals for the site by preventing exposure to residual contamination remaining at the site after the completed IRM. A declaration of covenants and restrictions and a site management plan will be put in place to monitor the site and ensure that the remedy remains protective of public health and the environment in the long-term. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 4.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the RI/FS Report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

The proposed remedy, Alternative 4, will satisfy this criterion through the completed IRMs and ensuring appropriate long-term management of the site by requiring implementation of the site management plan. The reduction of contaminant mass achieved by the IRM is expected to reduce contaminant concentrations in surrounding groundwater through natural attenuation processes. Alternative 1 (No Further Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternative 2 (Restoration to Pre-Disposal Conditions), by removing all soil contaminated above the Unrestricted soil cleanup objective, meets the threshold criteria. Alternative 3 (Excavation for Commercial Use) also meets this threshold criteria, but to a lesser extent than Alternative 2.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

The proposed remedy, Alternative 4, complies with SCGs to the extent practicable. It addresses waste disposal areas (by the completed IRMs) and complies with the restricted use soil cleanup objectives throughout a majority of the site. It also provides for long-term site management to ensure that the remedy remains in place and effective. Alternative 2, also complies with this criterion by removing all material that exceeds the unrestricted SCGs from the site. Alternative 3 complies with this criterion by removing all material that exceeds restricted SCGs and providing for long term site management of material that exceeds the unrestricted SCGs. Because Alternatives 2, 3, and 4 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

Long-term effectiveness is best accomplished by Alternative 2, which includes the excavation and off-site disposal of all soil exceeding unrestricted SCGs. Alternatives 3 and 4 are also effective in the long-term, but to a lesser degree or with lower certainty. Alternative 3 allows for commercial use of the site by excavating all soil exceeding the restricted use SCGs while Alternative 4 allows for commercial use by the completed IRM. Both Alternatives 3 and 4 require long term use restrictions, on-site groundwater restrictions, and implementation of a site management plan. The risk from leaving contamination exceeding the SCGs under both Alternatives 3 and 4 is low. The site cover in Alternative 4 is a proven technology for eliminating potential exposure pathways from contaminated soil and will allow for the same level of use as Alternative 3.

Alternative 3 and 4 require a groundwater use restriction, whereas Alternative 2 does not. However, municipal water supplies not impacted by on-site groundwater serve the surrounding area and groundwater is not used for other commercial or industrial purposes. While buildings do not exist on-site, Alternative 2 completely reduces the risk of soil vapor intrusion if buildings are constructed in the future. Alternatives 3 and 4 include conditions in the site management plan for the evaluation and mitigation of soil vapor intrusion in the event that buildings are constructed in the future. Alternative 4 is expected to generate considerably less greenhouse gases than Alternative 2, and to a lesser extent Alternative 3.

4. Reduction of Toxicity, Mobility, or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility, or volume of the wastes at the site.

Alternative 2 completely removes the remaining volume of contamination from the site through excavation and off-site disposal. A portion of this contamination will be permanently destroyed via incineration (removing its toxicity), with the remainder placed in a secure land disposal facility (reducing its mobility). Alternative 2 does not require a groundwater use restriction.

Alternative 3 will reduce the volume of contamination at the site through excavation and off-site disposal to allow for commercial use. As with Alternative 2, a portion of the disposed material may require incineration (removing its toxicity) with the remaining material placed in a secure land disposal facility (reducing its mobility). Alternative 3 will not reduce the volume, toxicity, and mobility of the remaining contamination exceeding the unrestricted SCGs. Alternative 3 requires a groundwater use restriction.

Alternative 4 will not reduce the toxicity or volume of contamination beyond that achieved by the IRM. However, the IRM has already reduced the volume of contamination at the site by achieving commercial SCGs or significantly reducing concentrations levels. In Hot Spots 1/3, 2, and 4, where contamination remains above commercial use SCGs, concentrations have been reduced by 49%, 97%, and 93%, respectively. Alternative 4 reduces the mobility of the contamination through the already placed cover over areas exceeding commercial use SCGs. Alternative 4 requires a groundwater use restriction.

5. Short-term Impacts and Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternative 2 has significant short-term impacts, which would be difficult to control while maintaining vehicular access through the site. The remediation will take at least one to two construction seasons to complete, resulting in significant truck traffic on local residential roadways. Given the size of the excavation it is likely that dust and material tracking into the adjacent residential area will be a concern. It is anticipated that this remedy will require diverting portions of the Niagara River or other controls to prevent excessive river water from infiltrating into the remedial excavation. Given the proximity of the site to the cataracts, this diversion may present health and safety obstacles for construction workers. Alternative 2 will also result in the generation of significant amount of greenhouse gases due to the extensive size of the excavation and amount off-site transportation required.

Alternative 3 will have similar short-term impacts as Alternative 2, but at a much smaller scale. Diversion of the Niagara River is likely not necessary under Alternative 3, though the management of infiltrating Niagara River water will still be required. The remediation will take at least one construction season to complete and will generate a moderate amount of greenhouse gases. Dust and material tracking into the adjacent residential area may be a concern, but will be easier to control as compared to Alternative 2.

Alternative 4 has no short-term impacts as construction of the cover in required areas of the site was completed as part of the IRM. Alternative 4 will generate no greenhouse gases since all construction activities are complete.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

Alternative 2 is implementable using existing technology, but the volume of soil excavated under this alternative will complicate implementation and will necessitate increased truck traffic on local roads during excavation work. It is not anticipated that a single facility will have the capacity to accept all the excavated soil, complicating off-site disposal and transport. It is anticipated that this remedy will require diverting portions of the Niagara River to prevent excessive river water from infiltrating into the remedial excavation. Given the flow volume and proximity of the site to the cataracts, this diversion may be technically difficult to complete and may require federal permits. The site is also bisected by a newly constructed road and a buried fiber optic which will complicate access for excavation.

Alternative 3 is implementable using existing technology, as it requires a relatively limited amount of excavation. Some areas of excavation will be complicated by the presence of a buried fiber optic cable and proximity to the Niagara River. The institutional controls and site management plan can be completed using existing personnel and materials.

Alternative 4 is the most implementable alternative, as it only requires filing a declaration of covenants and restrictions as an institutional control and preparing and implementing a site management plan. The institutional controls and site management plan can be completed using existing personnel and materials.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

The costs of the alternatives vary significantly. Alternative 2 has extremely high capital costs, but has no ongoing annual costs. Alternative 3 still has high capital costs and will require ongoing annual costs related to site management and institutional controls. Alternative 4 has very low capital costs and ongoing annual cost similar to Alternative 3. Alternative 3 has significantly higher capital costs than Alternative 4 while they will achieve the same level of use at the site. Alternative 2 is the least cost effective alternative, while Alternative 4 is the most cost effective.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The current, intended, and reasonably anticipated future land use for the site is as a public park used for passive recreation (commercial use). Alternatives 2, 3, and 4 will all allow for this land use.

The final criterion, Community Acceptance, is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 4 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.

LEGEND

- SITE BOUNDARY
- OUTLINE OF FORMER POND

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
REMEDIAL INVESTIGATION
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	7/5/17	Updates

REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 23, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

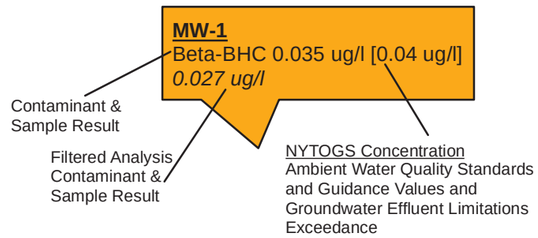
SITE BOUNDARY MAP

PRAP Figure 1

LEGEND

- SITE BOUNDARY
- GROUNDWATER MONITORING WELL LOCATION
- NIAGARA RIVER GAUGE LOCATION

LABEL LEGEND



NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) EACH WELL SHOWS T.O.G.S. EXCEEDANCES FOR THE MOST RECENT SAMPLING EVENT IN THAT LOCATION. THESE SAMPLING EVENTS INCLUDE:
- EVENT 1 - AUGUST 2016
- EVENT 2 - JANUARY 2017
- EVENT 3 - APRIL 2017
- EVENT 4 - DECEMBER 2017

FOR A COMPLETE DATA RESULTS LIST INCLUDING NATURALLY OCCURING METALS SUCH AS IRON, MAGNESIUM, MANGANESE, SODIUM, ALUMINUM, ETC., SEE TABLE 14.

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
INTERIM REMEDIAL MEASURES
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION
	2/6/18	UPDATES

REVISIONS

PROJECT NO:	190720009
DATE:	DECEMBER 2, 2016
DRAWN BY:	A. DeMARCHI
DESIGNED BY:	A. DeMARCHI
CHECKED BY:	D. RIKER

EXTENT OF CONTAMINATION - GROUNDWATER

PRAP Figure 2

Path: F:\Project\190F - New York State Office of Parks\2014-16 Term Agreement for Alleg, Gen, & Niag Regions\190720004 - Contaminated Soils Plan for NFSP-Riverway\Planning-Study\CADD_GIS\Projects\RIFS\FIGURE_5B.mxd

LEGEND

- SITE BOUNDARY
- SAMPLE - ABOVE COMMERCIAL USE SCOS
- SAMPLE - BELOW COMMERCIAL USE SCOS
- ARSENIC DELINEATION EXCAVATION
- BOUNDARY OF NEW POND

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
REMEDIAL INVESTIGATION/INTERIM REMEDIAL MEASURES
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 7, 2018
DRAWN BY:	A. SVIRGUN
DESIGNED BY:	A. SVIRGUN
CHECKED BY:	D. RIKER

OVERALL EXTENT OF CONTAMINATION - SURFACE SOIL

PRAP Figure 3

Path: F:\Project\190F - New York State Office of Parks\2014-16 Term Agreement for Alleg, Gen, & Niag Regions\190720004 - Contaminated Soils Plan for NFSP-Riverway\Planning-Study\CADD_GIS\Projects\RIFS\FIGURE_5.mxd

LEGEND

- SITE BOUNDARY
- SAMPLE - ABOVE COMMERCIAL USE SCOS
- LIGHT POLE SAMPLE LOCATION - ABOVE COMMERCIAL USE SCOS
- SAMPLE - BELOW COMMERCIAL USE SCOS
- TEST PIT LOCATION - ABOVE COMMERCIAL USE SCOS
- TEST PIT LOCATION - BELOW COMMERCIAL USE SCOS
- NYSDOT-UTILITY RELATED TEST PIT LOCATION- BELOW COMMERCIAL USE SCOS
- BOUNDARY OF NEW POND
- SOIL COVER MATERIAL

EXCAVATED AREAS

- DSI TP4 EXCAVATION
- HOT SPOTS 1&3 EXCAVATION
- HOT SPOTS 4, 4A, 5, AND 6 FINAL EXCAVATION[3)]
- UTILITY TRENCHES
- HOT SPOT 2 EXCAVATION

NOTES

1) COORDINATE SYSTEM: NAD 1983 STATEPLANE NY WEST FIPS 3103
PROJECTION: TRANSVERSE MERCATOR
DATUM: NORTH AMERICAN 1983
UNITS: FOOT US

2) THE SITE BOUNDARY INCLUDES ALL LAND UP TO THE WATER'S EDGE, DESPITE THE BOUNDARY SET BY THE TAX PARCEL.

3) HOT SPOTS 4, 4A, 5, AND 6 WERE REMOVED FROM THE ON-SITE PORTION OF THE NEW POND FOOTPRINT.

4) UNEXCAVATED SAMPLE LOCATIONS THAT ARE ABOVE COMMERCIAL USE SCOS ARE VISIBLE AND IN RED. WHILE SOME TEST PIT LOCATIONS AND ADDITIONAL SAMPLE LOCATIONS THAT WERE BELOW COMMERCIAL USE SCOS ARE SHOWN, MORE DETAILED SAMPLING CAN BE FOUND ON FIGURES 12-15.

0 75 150 300
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NEW YORK STATE OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION
ROBERT MOSES PARKWAY - SOUTH SITE
REMEDIAL INVESTIGATION/INTERIM REMEDIAL MEASURES
NIAGARA FALLS, NEW YORK

MARK	DATE	DESCRIPTION

REVISIONS

PROJECT NO:	190720009
DATE:	FEBRUARY 7, 2018
DRAWN BY:	A. SVIRGUN
DESIGNED BY:	A. SVIRGUN
CHECKED BY:	D. RIKER

OVERALL EXTENT OF CONTAMINATION - SUBSURFACE SOIL

PRAP Figure 4