PROPOSED REMEDIAL ACTION PLAN

Willis Avenue - Former Ball Field
State Superfund Project
Syracuse, Onondaga County
Site No. 734072
February 2021

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 the 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 repositories 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 online through the DECinfo Locator: https://www.dec.ny.gov/data/DecDocs/734072/ or at the following repositories:

Atlantic States Legal Foundation
Attn: Samuel Sage
658 West Onondaga Street
Syracuse, NY 13204
Phone: (315) 475-1170

NYSDEC
Attn: Stephanie Webb
615 Erie Boulevard, West
Syracuse, NY 13204
Phone: (315) 426-7441

Solvay Public Library
615 Woods Road
Solvay, NY 13209
(315) 468-2441

(*Repositories may be unavailable due to COVID-19 precautions. If you cannot access the online repository, please contact the NYSDEC project manager for assistance*)

A public comment period has been set from:

February 17, 2021 to March 19, 2021

Written comments may be sent through March 19, 2021 to:

Tracy Alan Smith
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
tracy.smith@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 Willis Avenue – Former Ball Field Site (site) is located in an urban area at the intersection of Willis Avenue and State Fair Boulevard in the Town of Geddes.

Site Features: The site is approximately 13 acres in size and consists of a fairly flat area which slopes to the south towards existing railroad tracks.

Current Zoning and Land Use: The site is currently zoned as industrial. The western half of the site is a vacant lot and the remaining area is an equipment rental facility. The surrounding area consists of industrial facilities, highways, and railroad tracks.

Historical Use: The site lies within an area known to have been used by Honeywell (or their predecessors) during the 1920s for the disposal of Solvay waste. The area was used as a baseball field in the 1960s and 1970s by employees of the former Willis Avenue plant located adjacent to the site.

Information from a former employee indicated that the site was used as a landfill for miscellaneous debris during the 1940s, and aerial photographs indicate that fill materials were placed on the site between 1938 and 1959. During the site investigations, fill materials were found on the site confirming that the site was used as a landfill. The fill material consisted of Allen-Moore diaphragm cell bodies and related graphite (which were used in chemical manufacturing at the Willis Avenue plant), various glassware including lab vials/test tubes, etc., decayed drums, construction and demolition debris, miscellaneous metal debris, and boiler slag.

Geology and Hydrogeology: The local geology consists of seven distinct layers including fill material, Solvay waste, marl, silt and clay, silt and fine-grained sand/basal sand and gravel, glacial till, and bedrock.

The site has three distinct groundwater zones including:

- a shallow zone that includes the fill material and underlying Solvay waste;
- an intermediate zone that consists of the fine-grained marl layer; and
- a deep zone, which includes the silt and fine-grained sand deposits above the glacial till.

The elevation of the shallow zone ranges from a minimum elevation of approximately 355 feet (ft) above mean sea level (amsl) along the northwest corner of the site to 363 ft amsl along the southwest corner of the site. The maximum thickness of this unit is approximately 45 ft with an average thickness around 35 ft. The marl unit ranges from approximately 345 ft amsl to 362 ft amsl. The maximum thickness of the marl is approximately 20 ft and the average thickness is around 10 ft. The deep sand and gravel layer that is present locally is not present on the site. The marl is directly underlain by silt and clay (northeast portion of site), silt and sand (northwest portion of the site), or till (center of site towards the east).

Groundwater is located at approximately 15 to 20 ft below ground surface (bgs) and primarily flows to the north/northeast toward Onondaga Lake, which is approximately 500 feet north 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 that restrict the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) are 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

The Department and Honeywell International, Inc. (Honeywell), entered into a Consent Order, Index No. R7-20200108-4, on August 11, 2020. This Order obligates Honeywell to implement a full remedial program. A Preliminary Site Investigation was completed under a previous Consent Order, Index No. D-7- 0002-00-02, between the Department and Honeywell dated April 26, 2000.

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,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this Site includes data for:

- groundwater
- soil
- soil vapor
- indoor air
- sub-slab vapor

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 contaminants of concern identified at this site include:

benzene
hexachlorobenzene
chlorobenzene
naphthalene
total polycyclic aromatic hydrocarbons (PAHs)
polychlorinated biphenyls (PCBs)
chromium
mercury

As illustrated in Exhibit A, the contaminants 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.

There were no IRMs performed at this site during the RI. However, barrier walls and groundwater collection systems were installed along the shoreline of Onondaga Lake under remediation performed at the adjacent Willis Avenue and Wastebed B/Harbor Brook sites (see Figure 2). These systems are located hydraulically downgradient from the Willis Avenue – Former Ball Field Site and prevent the discharge of contaminated shallow and intermediate groundwater from the site to

Onondaga Lake. The collected water is treated at Honeywell's adjacent Willis Avenue Groundwater Treatment Plant (GWTP).

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.

The Fish and Wildlife Resources Impact Analysis (FWRIA) for the site, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to wildlife receptors. There are no unique or aquatic habitats within the boundaries of the site and potential environmental receptors include terrestrial wildlife utilizing the site. Contaminants of potential concerns to environmental receptors that were identified for surface soil included inorganics, various VOCs, PAHs, PCBs, and pesticides.

Based upon the investigations performed, it appears that waste was heterogeneously disposed across the entire site from approximately 0-20 ft bgs. Contaminant concentrations vary across the site but there were no apparent source areas identified. The primary contaminants of concern are chlorinated benzenes, polycyclic aromatic hydrocarbons (PAHs) including naphthalene, PCBs, mercury, and chromium.

Shallow soil (0-12 inches) - Contaminants in shallow soil detected above the Part 375 commercial use soil cleanup objectives (SCOs) include benzo(a)anthracene (up to 310 parts per million, or ppm, SCO of 5.6 ppm), benzo(a)pyrene (up to 350 ppm, SCO of 1 ppm), benzo(b)fluoranthene (up to 410 ppm, SCO of 5.6 ppm), chrysene (up to 290 ppm, SCO of 56 ppm), indeno(1,2,3-CD)pyrene (up to 180 ppm, SCO of 5.6 ppm), arsenic (up to 34 ppm, SCO of 16 ppm) and mercury (up to 92 ppm, SCO of 2.8 ppm).

Subsurface soil (greater than two feet) - Contaminants in subsurface soil detected above the Part 375 commercial use soil cleanup objectives (SCOs) include 1,2,4-trimethylbenzene (at concentrations up to 780 ppm, SCO of 190 ppm), 1,3,5-trimethylbenzene (at concentrations up to 260 ppm, SCO of 190 ppm), hexachlorobenzene (up to 40 ppm, SCO of 6 ppm), benzo(a)anthracene (up to 120 ppm, SCO of 5.6 ppm), benzo(a)pyrene (up to 96 ppm, SCO of 1 ppm), benzo(b)fluoranthene (up to 140 ppm, SCO of 5.6 ppm), indeno(1,2,3-CD)pyrene (up to 55 ppm, SCO of 5.6 ppm) naphthalene (up to 5,100 ppm, SCO of 500 ppm), PCBs (up to 580 ppm, SCO of 1 ppm), arsenic (up to 148 ppm, SCO of 16 ppm), mercury (up to 1,760 ppm, SCO of 2.8 ppm), and chromium (up to 8,350 ppm, SCO of 400 ppm[1]).

Groundwater - Contaminants in the groundwater (from approximately 15 to 60 ft bgs) that exceeded groundwater standards or guidance values included benzene (up to 110 parts per billion, or ppb, standard of 1 ppb), chlorobenzene (up to 7 ppb, standard of 5 ppb), toluene (up to 57 ppb, standard of 5 ppb), 1,2-dichlorobenzene (up to 29 ppb, standard of 3 ppb), 1,4-dichlorobenzene (up to 98 ppb, standard of 3 ppb), phenol (up to 13,000 ppb, standard of 1 ppb), chromium (up to

[1] This assumes all chromium is present in hexavalent form.

431 ppb, standard of 50 ppb), lead (up to 682 ppb, standard of 25 ppb), and mercury (up to 31 ppb, standard of 0.7 ppb).

As discussed above, remediation performed at the adjacent Willis Avenue and Wastebed B/Harbor Brook sites prevents the discharge of contaminated shallow and intermediate groundwater from the site to Onondaga Lake. In addition, deep groundwater at this and adjacent sites (i.e., Wastebeds 1-8, Semet Residue Ponds, Willis Avenue, Wastebed B/Harbor Brook) is being evaluated and will be addressed as part of a regional unit.

Soil Vapor - Contaminants detected in soil vapor included benzene (at concentrations up to 31 g/m^3), tetrachloroethene (up to 610 g/m^3), trichloroethene (up to 71 g/m^3) and toluene (up to 150 g/m^3). A full summary of the soil vapor results is included in Exhibit A. Based on the soil vapor, indoor air and sub-slab vapor samples, the indoor air in the building at the site is not impacted by compounds detected in soil and groundwater and the building does not warrant further investigation. However, mitigation of potential impacts from soil vapor intrusion into future buildings that may be constructed at the site will need to be evaluated as part of the remedy.

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 are not drinking the contaminated groundwater because the area is served by a public water supply that is not affected by site-related contamination. People who enter the site may come into contact with soil and groundwater contamination if they walk on or dig below the ground surface. Volatile organic compounds in soil vapor (air spaces within the soil) may move into buildings and affect the indoor air quality. This 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. Environmental data indicates soil vapor intrusion is not a concern for on-site or off-site buildings at this time. The potential exists for soil vapor intrusion to occur for any future occupied buildings constructed at the site.

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 (RAOs) for this site are:

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking

water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection
- Prevent the discharge of contaminants to surface water.

Soil

RAOs for Public Health Protection
- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection
- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

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 the 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 Consolidation and Cover System remedy.

The estimated present worth cost to implement the remedy is $3,600,000. The cost to construct the remedy is estimated to be $3,200,000 and the estimated average annual cost is $24,000.

The elements of the proposed remedy are as follows:

Consolidation

Shallow excavation (e.g., swale area) and grading activities may precede cover installation in portions of the site such that the final cover grade would match the existing roadway, building and parking lot grades, or otherwise be compatible with development of the site. Approximately 1,600 cubic yards (cy) of soil will be excavated from a swale area along State Fair Boulevard from an area measuring approximately one acre to an approximate depth of one foot as depicted on Figure 3 and consolidated on-site. As needed, clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be imported to replace the excavated soil and establish the designed grades at the site.

Cover System

A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot of granular/stone material or one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Cover material, including any fill material brought to the site, will meet the SCOs for cover material for commercial use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a commercial cleanup at a minimum.

In addition, downgradient barrier walls and collection systems have been installed as part of adjacent site remedies that prevent the discharge of contaminated shallow and intermediate groundwater from the site to Onondaga Lake. This hydraulic control system is a component of those remedies but is also necessary to meet the groundwater RAO for the Willis Avenue - Former Ball Field Site. While the operation, maintenance and monitoring of those systems will be implemented under the Site Management Plans for the adjacent sites, it will remain necessary as part of the Willis Avenue – Former Ball Field Site remedy until groundwater at and emanating from the Willis Avenue – Former Ball Field Site meets ambient water quality standards.

Institutional Control

Imposition of an institutional control in the form of an environmental easement 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 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.

Site Management Plan

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

1. 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 Environmental Easement discussed above.

   Engineering Controls: The soil cover discussed 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;
   - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including a provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs);
   - 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.

2. 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;

- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

3. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any physical components of the remedy. The plan includes, but is not limited to:
    - procedures for maintaining the remedy;
    - maintaining site access controls and Department notification; and
    - providing the Department access to the site and O&M records.

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 five categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, metals, and pesticides. For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil and groundwater, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Groundwater

Four rounds of groundwater samples were collected from monitoring wells in May 2001, February/March 2003, August 2003 and December 2005. Groundwater samples were analyzed for VOCs, SVOCs, pesticides, PCBs and inorganics, including mercury and cyanide. Refer to Table 1.

Seventeen wells were installed at the site. Contaminants exceeding Class GA Standards or Guidance Values included:

- VOCs including benzene, toluene, ethylbenzene and xylene (BTEX), chloroform, tetrachloroethene, acetone, 2-butanone, vinyl chloride, and chloroethane.
- SVOCs including polycyclic aromatic hydrocarbons (e.g., benzo(a)anthracene, pyrene), phenols (e.g., phenol, 2-methylphenol, 4-methylphenol), bis(2-ethylhexyl)phthalate and chlorobenzenes (e.g., chlorobenzene, 1,2-dichlorobenzene, 1,4-dichlorobenzene).
- Inorganics including sodium, iron, chromium, magnesium, sulfate, lead, mercury, manganese, antimony, chloride, copper, selenium, arsenic, cyanide, barium, and thallium.

There were no detections of PCBs at concentrations above Class GA values.

Table 1 – Summary of Detections in Groundwater

VOCs			
Analyte	**Concentration Range (ppb)**	**Class GA Value* (ppb)**	**Frequency Exceeding Class GA Value**
1,2-Dichlorobenzene	ND - 47	3(S)	5/21
1,2-Dichlorobenzene	ND - 29	3(S)	6/33
2-Butanone	ND - 300	50(G)	5/33
Acetone	ND - 1,300	50(S)	20/44
Benzene	ND - 330	1(S)	21/44

Chlorobenzene	ND - 7.0	5(S)	1/44
Chloroethane	ND - 14	5(S)	3/44
Chloroform	ND - 32	7(S)	6/44
Tetrachloroethene	ND - 13	5(S)	4/44
Toluene	ND - 57	5(S)	9/44
Vinyl Chloride	ND - 6.0	2(S)	1/44
Xylenes, Total	ND - 17	5(S)	1/10
Xylenes, M & P	ND - 12	5(S)	2/34
1,4-Dichlorobenzene	ND - 98	3(S)	6/33
SVOCs			
Analyte	**Concentration Range (ppb)**	**Class GA Value* (ppb)**	**Frequency Exceeding Class GA Value**
1,4-Dichlorobenzene	ND - 12	3(S)	1/21
2-Chlorophenol	ND - 11	1(S)	4/44
2-Methylphenol	ND - 160	1(S)	12/44
2-Nitrophenol	ND - 390	1(S)	7/44
4-Chloro-3-Methylphenol	ND - 3.0	1(S)	1/44
4-Methylphenol	ND - 4,800	1(S)	11/44
4-Nitrophenol	ND - 380	1(S)	6/44
Benzo(a)anthracene	ND - 40	0.002(G)	4/44
Benzo(b)fluoranthene	ND - 39	0.002(G)	5/44
Benzo(k)fluoranthene	ND - 38	0.002(G)	2/44
Bis(2-ethylhexyl)phthalate	ND - 110	5(S)	6/44
Chrysene	ND - 44	0.002(G)	4/44
Fluoranthene	ND - 80	50(G)	1/44
Indeno(1,2,3-cd)pyrene	ND - 27	0.002(G)	3/44
Nitrobenzene	ND - 8.3	0.4(S)	3/44
Phenol	ND - 13,000	1(S)	19/44
Pyrene	ND - 57	50(G)	1/44
Pesticides			
Analyte	**Concentration Range (ppb)**	**Class GA Value* (ppb)**	**Frequency Exceeding Class GA Value**
Beta-BHC	ND - 1.0	0.4(S)	1/44
Inorganic Compounds			
Analyte	**Concentration Range (ppm)**	**Class GA Value* (ppm)**	**Frequency Exceeding Class GA Value**
Antimony	ND - 0.0148	0.003(G)	2/44
Arsenic	ND - 0.257	0.025(S)	5/44
Barium	ND - 3.36	1(S)	4/44
Chromium	ND - 0.629	0.05(S)	17/44
Copper	ND - 1.61	0.2(S)	4/44
Cyanide	ND - 2.63	0.2(S)	10/44
Iron	ND - 48.2	0.3(S)	33/44

Lead	ND - 0.682	0.025(S)	6/44
Magnesium	ND - 293	35(G)	9/44
Manganese	ND - 1.55	0.3(S)	4/44
Mercury	ND - 0.119	0.0007(S)	14/44
Selenium	ND - 0.0315	0.01(S)	5/44
Sodium	25.1 - 8,590	20(S)	44/44
Thallium	ND - 0.008	0.0005(G)	1/44
Chloride	32.8 - 22,600	250	15/34
Sulfate	19.7 - 4430	250	23/34

Notes:
ppb - parts per billion (micrograms per kilogram)
ppm - parts per million (milligrams per kilogram)
ND - Analyte was not detected above the laboratory quantitation limit
* - NYSDEC Ambient Water Quality Standards (S) and Guidance Values (G) for Class GA water

Soil

Shallow Soil

Forty-three shallow soil samples were collected from depths between 0 to 12 inches (i.e., 0-2, 0-6 and 6-12 inches) to assess direct human exposure. These samples were taken during multiple phases of the investigation including test pits, shallow soil sampling, and direct push sampling. Refer to Table 2.

Compared to Unrestricted Use SCOs, predominant contaminants exceeding the Part 375 Unrestricted Use SCOs in shallow soils material included PAHs (e.g., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo[a,h]anthracene, indeno(1,2,3-CD)pyrene, chrysene) and inorganics.

The predominant contaminants exceeding Commercial Use SCOs in shallow soils were PAHs, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo[a,h]anthracene, and indeno(1,2,3-CD)pyrene, and inorganics (including mercury, arsenic, and barium).

Table 2 – Summary of Detections in Shallow Soil

VOCs					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
Methylene Chloride	ND - 180	50	2/43	500,000	0/43
SVOCs					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
1,4-Dichlorobenzene	ND - 1,900	1,800	1/41	130,000	0/41

Acenaphthene	ND - 110,000	20,000	1/43	200,000	0/43
Anthracene	ND - 110,000	100,000	1/43	500,000	0/43
Benzo(a)anthracene	ND - 310,000	1,000	23/43	5,600	8/43
Benzo(a)pyrene	ND - 350,000	1,000	25/43	1,000	25/43
Benzo(b)fluoranthene	ND - 410,000	1,000	25/43	5,600	11/43
Benzo(g,h,i)perylene	ND - 190,000	100,000	1/43	500,000	0/43
Benzo(k)fluoranthene	ND - 140,000	800	25/43	56,000	1/43
Chrysene	ND - 290,000	1,000	24/43	56,000	1/43
Dibenzo(a,h)anthracene	ND - 63,000	330	21/43	560	17/43
Dibenzofuran	ND - 33,000	7,000	1/43	350,000	0/43
Fluoranthene	ND - 480,000	100,000	1/43	500,000	0/43
Hexachlorobenzene	ND - 1,700	330	4/43	6,000	0/43
Indeno(1,2,3-cd)pyrene	ND - 180,000	500	26/43	5,600	5/43
Naphthalene	ND - 64,000	12,000	1/43	500,000	0/43
Phenanthrene	ND - 390,000	100,000	1/43	500,000	0/43
Phenol	ND - 960	330	1/43	500,000	0/43
Pyrene	ND - 400,000	100,000	1/43	500,000	0/43
Pesticides					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
4,4'-DDD	ND - 200	3.3	1/43	92,000	0/43
4,4'-DDE	ND - 42	3.3	3/43	62,000	0/43
4,4'-DDT	ND - 400	3.3	5/43	47,000	0/43
Endrin	ND - 25	14	1/43	89,000	0/43
Gamma-chlordane	ND - 700	100	1/25	9,200	0/25
PCBs					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
Aroclor-1254	ND - 1,000	100	11/43	1,000	0/43
Aroclor-1260	ND - 830	100	5/43	1,000	0/43
Aroclor-1268	ND - 1,000	100	3/43	1,000	0/43
Inorganic Compounds					
Analyte	**Concentration Range (ppm)**	**Unrestricted Use SCO (ppm)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppm)**	**Frequency Exceeding CUSCO**
Arsenic	2.5 - 34.6	13	16/43	16	10/43
Barium	27 - 2950	350	5/43	400	4/43
Chromium	ND - 124	30	10/43	400	0/43
Copper	5.2 - 252	50	19/43	270	0/43
Lead	5 - 577	63	20/43	1,000	0/43
Mercury	ND - 91.9	0.18	37/43	2.8	23/43
Nickel	7.5 - 61.9	30	5/43	310	0/43

Zinc	16.6 - 453	109	13/43	10,000	0/43

Notes:
ppb - parts per billion (micrograms per kilogram)
ppm - parts per million (milligrams per kilogram)
ND - Analyte was not detected above the laboratory quantitation limit
SCO - Soil Cleanup Objective
UUSCO - Unrestricted Use Soil Cleanup Objective
CUSCO - Commercial Use Soil Cleanup Objective

Subsurface Soil

Ninety-eight subsurface soil samples were collected from depths greater than two feet bgs. These samples were taken during multiple phases of the investigation including test pits, Geoprobe borings and soil borings. Refer to Table 3.

Compared to Unrestricted Use SCOs, predominant contaminants exceeding the Part 375 Unrestricted Use SCOs in subsurface soil/fill material included tetrachloroethene, benzene, PAHs (e.g., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo[a,h]anthracene, chrysene, indeno(1,2,3-CD)pyrene), PCBs (Aroclor-1254), and inorganics.

The predominant contaminants exceeding Commercial Use SCOs in subsurface soil were PAHs (e.g., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo[a,h]anthracene, and indeno(1,2,3-cd)pyrene), hexachlorobenzene, PCBs (Aroclor-1254), and inorganics (including mercury, arsenic, manganese, cyanide, and barium).

Table 3 – Summary of Detections in Subsurface Soil

VOCs					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
1,2,4-Trimethylbenzene	ND - 780,000	3,600	4/40	190,000	1/40
1,2-Dichlorobenzene	ND - 11,000	1,100	1/64	500,000	0/64
1,3,5-Trimethylbenzene	ND - 260,000	8,400	2/40	190,000	1/40
1,3-Dichlorobenzene	ND - 3,400	2,400	1/64	280,000	0/64
1,4-Dichlorobenzene	ND - 38,000	1,800	1/64	130,000	0/64
Acetone	ND - 490	50	26/98	500,000	0/98
Benzene	ND - 890	60	3/98	44,000	0/98
Butylbenzene	ND - 30,000	1,200	3/40	500,000	0/40
Chlorobenzene	ND - 120,000	1,100	1/98	500,000	0/98
Chloroform	ND - 650	370	1/98	350,000	0/98
Ethylbenzene	ND - 19,000	1,000	2/98	390,000	0/98
Methylene chloride	ND - 91	50	1/98	500,000	0/98
N-propylbenzene	ND - 4,900	3,900	1/40	500,000	0/40

Naphthalene	ND - 190,000	1,200	6/40	500,000	0/40
Sec-butylbenzene	ND - 120,000	11,000	1/40	500,000	0/40
Styrene	ND - 1,200	1,000	1/98	390,000	0/98
Tert-butylbenzene	ND - 14,000	5,900	1/40	500,000	0/40
Tetrachloroethene	ND - 2,700	1,300	1/98	150,000	0/98
Toluene	ND - 3,100	700	1/98	500,000	0/98
Xylenes, total	ND - 120,000	260	5/40	500,000	0/40
SVOCs					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
1,2-Dichlorobenzene	ND - 150,000	1,100	5/74	500,000	0/74
1,3-Dichlorobenzene	ND - 6,300	2,400	1/74	130,000	0/74
1,4-Dichlorobenzene	ND - 98,000	1,800	7/74	130,000	0/74
4-Methylphenol	ND - 2,900	330	2/98	500,000	0/98
Acenaphthene	ND - 26,000	20,000	1/98	500,000	0/98
Benzo(a)anthracene	ND - 120,000	1,000	27/98	1,000	27/98
Benzo(a)pyrene	ND - 96,000	1,000	26/98	5,600	8/98
Benzo(b)fluoranthene	ND - 140,000	1,000	28/98	5,600	12/98
Benzo(k)fluoranthene	ND - 50,000	800	22/98	56,000	0/98
Chrysene	ND - 120,000	1,000	27/98	56,000	1/98
Dibenzo(a,h)anthracene	ND - 19,000	330	17/98	560	13/98
Dibenzofuran	ND - 22,000	7,000	1/98	350,000	0/98
Fluoranthene	ND - 290,000	100,000	1/98	500,000	0/98
Fluorene	ND - 31,000	30,000	1/98	500,000	0/98
Hexachlorobenzene	ND - 40,000	330	10/98	6,000	4/98
Indeno(1,2,3-cd)pyrene	ND - 55,000	500	24/98	5,600	6/98
Naphthalene	ND - 5,100,000	12,000	6/98	500,000	1/98
Phenanthrene	ND - 270,000	100,000	1/98	500,000	0/98
Phenol	ND - 6,200	330	4/98	500,000	0/98
Pyrene	ND - 220,000	100,000	1/98	500,000	0/98
Pesticides					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
4,4'-DDD	ND - 2,000	3.3	1/98	92,000	0/98
4,4'-DDE	ND - 2,000	3.3	1/98	62,000	0/98
4,4'-DDT	ND - 110	3.3	1/98	47,000	0/98
PCBs					
Analyte	**Concentration Range (ppb)**	**Unrestricted Use SCO (ppb)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppb)**	**Frequency Exceeding CUSCO**
Aroclor-1254	ND - 580,000	100	13/98	1,000	10/98
Aroclor-1260	ND - 290	100	2/98	1,000	0/98

Aroclor-1268	ND - 16,000	100	1/98	1,000	2/98
Inorganic Compounds					
Analyte	**Concentration Range (ppm)**	**Unrestricted Use SCO (ppm)**	**Frequency Exceeding UUSCO**	**Commercial Use SCO (ppm)**	**Frequency Exceeding CUSCO**
Arsenic	ND - 148	13	28/98	16	21/98
Barium	7 - 3,030	350	12/98	400	9/98
Beryllium	ND - 7.3	7.2	1/98	590	0/98
Cadmium	ND - 14	2.5	4/98	9	4/98
Chromium	ND - 8,350	30	18/98	400	4/98
Copper	ND - 21,900	50	27/98	270	13/98
Cyanide	ND - 83.5	27	10/98	27	11/98
Lead	ND - 2,710	63	30/98	1,000	2/98
Mercury	ND - 1,760	0.18	68/98	2.8	31/98
Nickel	ND - 1,210	30	16/98	310	2/98
Selenium	ND - 14.7	3.9	4/98	1,500	0/98
Silver	ND - 90.2	2	2/98	1,500	0/98
Zinc	7.5 - 4,530	109	26/98	10,000	0/98

Notes:
ppb - parts per billion (micrograms per kilogram)
ppm - parts per million (milligrams per kilogram)
ND - Analyte was not detected above the laboratory quantitation limit
SCO - Soil Cleanup Objective
UUSCO - Unrestricted Use Soil Cleanup Objective
CUSCO - Commercial Use Soil Cleanup Objective

Soil Vapor

In 2005 soil vapor samples were collected from five locations at the site. Two samples were collected at each location, one from 8 ft bgs and one from just above the groundwater table (approximately 20 ft bgs).

Based on this sampling the following contaminants were detected in soil vapor:

- Petroleum compounds: trimethylbenzenes, trimethylpentane, ethyltoluene, benzene, ethylbenzene, xylenes, heptane and toluene.
- Solvents: 1,1,1-trichloroethane (1,1,1-TCA), methylene chloride, tetrachlorothene (PCE), carbon disulfide, and trichlorothene (TCE).
- Freons: Freon 11 and 12.
- Degradation compounds: 1,2-dichlorothene and *cis*-1,2-dichloroethene.
- Fumigants: *trans*-1,2-dichlorothene and *trans*-1,3-dichloropropane.
- Other compounds: chloroform and bromodichloromethane.

Based on the results an indoor air and sub-slab vapor investigation was performed as summarized below.

Table 4 – Summary of Detections in Soil Vapor

VOCs		
Analyte	**Concentration Range (µg/m^3)**	**Number of detections**
1,1,1-Trichloroethane	ND-3.9	5/10
1,1,2-Trichlorotriflouroethane	ND-0.93	1/10
1,1-Dichloroethane	ND-1.4	1/10
1,1-Dichloroethene	ND-4.6	2/10
1,2,4-Trimethylbenzene	1.8-11	10/10
1,3,5-Trimethylbenzene	0.75-4.4	10/10
2,2,4-Trimethylpentane	1.3-6.5	10/10
4-Ethyltoluene	0.65-4.5	10/10
Acetone	ND-290	4/10
Benzene	4-31	10/10
Bromodichloromethane	ND-2.6	3/10
Carbon disulfide	1.6-25	10/10
Carbon tetrachloride	ND-560	6/10
Chloroethane	ND-2.4	2/10
Chloroform	2.8-1600	10/10
Cis-1,2-dichloroethene	ND-7.4	2/10
Dichlorodifluoromethane	2.9-530	10/10
Ethylbenzene	4.5-11	10/10
M-Xylene	8.7-33	10/10
Methylene chloride	1.1-4.9	10/10
N-Heptane	1.8-12	10/10
N-Hexane	2-28	10/10
O-Xylene	4.1-16	10/10
P-Xylene	3.5-15	10/10
Tetrachloroethene	74-610	10/10
Toluene	34-150	10/10
Trans-1,2-dichloroethene	ND-3	2/10
Trans-1,3-dichloropropene	ND-2.2	1/10
Trichloroethene	ND-71	6/10
Trichlorofluoromethane	1.4-220	10/10

Notes:
µg/m^3 - micrograms per cubic meter
ND - Analyte was not detected above the laboratory quantitation limit
VOCs - Volatile Organic Compounds

Indoor Air/Sub-slab Vapor

In March 2009 an indoor air and sub-slab vapor intrusion investigation was performed. This included the collection of two sub-slab samples, one indoor air sample and one ambient (outdoor) air sample at the site.

Detected contaminants included 1,3,5-trimethylbenzene, 1,3-butadiene, 2,2,4-trimethylpentane, 4-ethyltoluene, benzene, carbon tetrachloride, chloroform, dichlorodifluoromethane, n-heptane, n-hexane, tetrachloroethene, trichlorofluoromethane, and xylenes. The results were compared to the

2017 Soil Vapor/Indoor Air Matrix update in accordance with NYSDOH's October 2006 *Guidance for Evaluating Soil Vapor Intrusion in New York State.*

Based on this investigation the indoor air in the building at the site is not impacted by compounds detected below the building slab and the building does not warrant further investigation. However, mitigation of potential impacts from soil vapor intrusion into future buildings that may be constructed at the site will need to be evaluated as part of the remedy.

Table 5 – Summary of Detections in Indoor Air/Sub-slab Vapor

VOCs		
Analyte	**Sub-Slab Concentration ($\mu g/m^3$)**	**Indoor Air Concentration ($\mu g/m^3$)**
1,3,5-Trimethylbenzene*	3.4	0.93
1,3-Butadiene*	2.4	ND
2,2,4-Trimethylpentane*	ND	1.1
4-Ethyltoluene*	1.6-2.2	0.98
Benzene*	2.5-3.2	3
Carbon tetrachloride	ND	0.5
Chloroform*	7.3-17	ND
Dichlorodifluoromethane*	22-64	2.8
N-Heptane*	5.3-5.7	ND
N-Hexane*	4.6	3.3
O-Xylene*	2.6	2.5
Tetrachloroethene	9.5-12	0.53
Trichlorofluoromethane*	11-19	1.3
Xylenes, M & P*	4.3	6.5
xylenes, total*	6.9	8.7

Notes:
$\mu g/m^3$ - micrograms per cubic meter
ND - Analyte was not detected above the laboratory quantitation limit
VOCs - Volatile Organic Compounds
* - No standard established

Exhibit B

Description of Remedial Activities

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. Additional groundwater controls are not included in Alternatives 2 through 4 since downgradient barrier walls and collection systems have been installed as part of adjacent site remedies that prevent the discharge of contaminated shallow and intermediate groundwater from the site to Onondaga Lake.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment.

Alternative 2: Consolidation and Cover System

Alternative 2 includes excavation of contaminated soil from a drainage swale along State Fair Boulevard and consolidation beneath a cover system compatible with the reasonably anticipated future land uses at the site. This alternative would also include monitoring of shallow and intermediate groundwater along with institutional controls, a Site Management Plan, and periodic site reviews.

Consolidation
Shallow excavation (e.g., swale area) and grading activities may precede cover installation in portions of the site such that the final cover grade would match the existing roadway, building and parking lot grades, or otherwise be compatible with development of the site. Approximately 1,600 cy of soil will be excavated from a swale area along State Fair Boulevard from an area measuring approximately one acre to an approximate depth of one foot as depicted on Figure 3 and consolidated on-site. As needed, clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be imported to replace the excavated soil and establish the designed grades at the site.

Cover System
A site cover will be required to allow for commercial use of the site in areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot of granular/stone material or one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer, as necessary. Cover material, including any fill material brought to the site, will meet the SCOs for cover material for commercial use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Engineering and Institutional Controls

Imposition of an institutional control in the form of an environmental easement and a Site Management Plan, as described below, will be required. The remedy will achieve a commercial cleanup at a minimum.

Institutional Control

Imposition of an institutional control in the form of an environmental easement 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 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.

Site Management Plan

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

1. 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 environmental easement discussed above.

   Engineering Controls: The soil cover discussed 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;
   - descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;
   - a provision for evaluation of the potential for soil vapor intrusion for any occupied buildings on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
   - a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described above will be placed in any areas where the upper one foot of exposed surface soil exceeds the applicable soil cleanup objectives (SCOs);
   - 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.

2. 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;
    - monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

3. an Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, optimization, monitoring, inspection, and reporting of any physical components of the remedy. The plan includes, but is not limited to:
    - procedures for maintaining the remedy;
    - maintaining site access controls and Department notification; and
    - providing the Department access to the site and O&M records.

Costs

The estimated present worth cost to implement the remedy is $3,600,000. The cost to construct the remedy is estimated to be $3,200,000 and the estimated average annual cost is $24,000.

Present Worth:..... $3,600,000
Capital Cost:..... $3,200,000
Annual Costs:..... $24,000

Alternative 3: Targeted Excavation of Fill Material with Off-Site Disposal

Alternative 3 includes excavation and off-site disposal of fill material, but not the underlying Solvay waste. Restoration of the excavated area would include installation of clean backfill to generally restore the site to surrounding elevations although final elevations in some areas could be up to 10 ft lower than current conditions. This alternative would also include monitoring of shallow and intermediate groundwater along with institutional controls, a SMP, and periodic site reviews as described above for Alternative 2. This alternative is depicted on Figure 4.

Alternative 3 is intended to remove fill material deposited over Solvay waste for the purpose of minimizing erosion and potential exposure of human receptors over approximately 9 acres. Excavation is anticipated to require removal of fill materials as deep as 20 ft bgs. It is assumed that excavation would be conducted to the top of Solvay waste and clean backfill placed in anticipation of commercial development.

Targeted Excavation

Mechanical excavation would be conducted to remove fill material. Fill material includes diaphragm cells, laboratory equipment, construction and demolition debris, miscellaneous metal debris, and boiler slag deposited over Solvay waste. Fill material to be removed ranges in thickness from 3 to 20 ft over approximately 9 acres. Excavation would be conducted to achieve a minimum

temporary slope of 1:2 where possible, with sheet piling installed along select portions. Based on these approximate elevations, the total volume of fill material to be removed in Alternative 3 is estimated at approximately 297,000 cy. Due to the required setbacks and sloping from adjacent features (e.g., railways, roadways, existing utilities within the swale area) impacted material would remain following excavation. It is assumed that dewatering a portion of the fill material would be required prior to off-site transportation. To develop cost estimates it is anticipated that construction water would be treated at the adjacent Willis GWTP. Alternative 3 also would include removal of approximately 21,000 square feet of existing building foundations/slabs, resulting in approximately 3,900 tons of construction and demolition (C&D) material.

Off-Site Transportation

For remedial alternative cost estimation purposes, it was assumed a total estimated 515,000 tons of excavated historical fill material and associated site debris from existing building and foundations would be transported off-site under Alternative 3. It is estimated that the material would be shipped off-site in three construction seasons resulting in approximately 30,000 truck trips.

Site Restoration

As appropriate, grades would be modified from pre-excavation conditions to match surrounding grades (e.g., along adjacent roadways) in anticipation of future commercial redevelopment. An estimated 152,000 cy (approximately 9,000 truck trips) of clean backfill would be transported via trucks from an off-site borrow source to the site.

Costs

The estimated present worth cost to implement the remedy is $104,600,000. The cost to construct the remedy is estimated to be $104,300,000 and the estimated average annual cost is $24,000.

Present Worth:..... $104,600,000
Capital Cost:..... $104,300,000
Annual Costs:..... $24,000

Alternative 4: Site-Wide Excavation with Off-Site Disposal

Alternative 4 includes mechanical excavation of contaminated soil/fill material including fill and Solvay waste. This alternative also includes monitoring, institutional controls, a SMP, periodic reviews, as described in Alternative 2, as necessary (e.g., if all contaminated material cannot be removed due to stability issues as described below). Excavated soil/fill material would be transported off-site for management and/or disposal.

Alternative 4 is intended to evaluate restoration to pre-disposal conditions through the full excavation of soil/fill material. As such, Alternative 4 includes removal and replacement of soil/fill material at the Site exhibiting concentrations above Unrestricted Use SCOs. This is anticipated to require removal of material as deep as 45 ft bgs. Excavated material would be managed off-site. This alternative is depicted on Figure 5.

Excavation depths and volumes required to achieve pre-disposal conditions are anticipated to present constructability and community concerns (e.g., geotechnical, water management, truck traffic) described below and in Exhibit D.

Mechanical excavation would be conducted to remove site-wide soil/fill material. Material to be removed ranges in thickness up to 45 ft. No soil removal is assumed within 30 ft of rail structures. Excavation would be conducted to achieve a minimum temporary slope of 1:2 where possible, with sheet piling installed along select portions. Based on these approximate elevations, the total volume of soil/fill material in Alternative 4 is estimated at approximately 1,013,000 cy. Due to the required setbacks and sloping from adjacent features (e.g., railways, roadways) some impacted material may remain following excavation. Furthermore, excavation within the swale area would require removal and rerouting of State Fair Boulevard and utilities (i.e., subsurface gas line and above grade electrical).

Dewatering a portion of the soil/fill material would be required prior to off-site transportation. To develop cost estimates, it is anticipated that construction water would be treated at the adjacent Willis GWTP.

Alternative 4 would also include removal of approximately 21,000 square ft of existing building foundations/slabs, resulting in approximately 3,900 tons of C&D material.

Off-Site Transportation

A total estimated 1,634,000 tons of excavated soil/fill material and associated site debris from existing foundations and roadways would be transported off-site under Alternative 4. It is estimated that the material would be shipped off-site in nine construction seasons resulting in approximately 90,000 truck trips.

Site Restoration

Clean backfill would be transported via trucks from an off-site borrow source to the site, requiring an estimated 732,000 cy (40,000 truck trips), to restore excavated areas to near existing grades under Alternative 4.

Costs

The estimated present worth cost to implement the remedy is $379,700,000. The cost to construct the remedy is estimated to be $379,400,000 and the estimated average annual cost is $20,000.

Present Worth:..... $379,700,000
Capital Cost:..... $379,400,000
Annual Costs:..... $20,000

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Cost ($)	Total Present Worth ($)
1 - No Action	0	0	0
2 - Cover System	3,400,000	24,000	3,600,000
3 - Targeted Excavation of Fill Material with Off-Site Disposal	104,300,000	24,000	104,600,000
4 - Site-Wide Excavation with Off-Site Disposal	379,400,000	20,000	379,700,000

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 2, Consolidation and Cover System, as the remedy for this site. Alternative 2 achieves the remediation goals for the site by eliminating any exposure of soil contamination on-site above the site-specific commercial use SCOs and restricting the use of the site to commercial through an environmental easement. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 3.

Basis for Selection

Alternative 2, Consolidation and Cover System, is the preferred remedy in that it best fits all the remedy selection criteria. The Department believes that this remedy is protective of human health and the environment and satisfies the remediation objectives listed in Section 6.5.

Alternative 3 (Targeted Excavation of Fill Material with Off-Site Disposal), by removing all the fill material, meets the threshold criteria but would create short-term impacts, is substantially more costly than Alternative 2, and would be more difficult to implement.

Alternative 4 (Site-Wide Excavation with Off-Site Disposal), by removing all contaminated materials (i.e., fill material and Solvay waste) above the Unrestricted Use SCOs, meets the threshold criteria but would create severe short term impacts, is substantially more costly than Alternative 2, and would be the most difficult to implement.

Alternative 2 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the nine evaluation criteria. It would achieve the remediation goals for the site by removing potential exposure routes to the public.

Because Alternatives 2, 3 and 4 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site. Alternatives 2, 3, and 4 have short term impacts which could be controlled. However, Alternatives 3 and 4 have more significant short-term impacts than Alternative 2 due to the greater amount of earthwork required for soil excavation, disposal, and backfill. The time needed to achieve the remediation goals is 3 and 9 years for Alternatives 3 and 4, respectively, compared to one year for Alternative 2. Alternatives 2 and 3 return the site to commercial use (the proposed future use of the site); and Alternative 4 returns the site to pre-disposal conditions. Alternatives 2 and 3 require an environmental easement to limit the future land use.

The cost differences between Alternatives 2, 3, and 4 are significant. The lowest cost option is Alternative 2, which is $3,600,000. Alternatives 3 and 4 are two orders of magnitude larger than the cost of Alternative 2 ($104,300,000 and $379,400,000, respectively), due to the significant amount of earthwork required for soil excavation, disposal, and backfill.

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 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 2) satisfies this criterion by eliminating the potential exposure to contaminated soils, groundwater and soil vapor intrusion on-site. Alternative 1 (No Action) does not provide any protection to public health and the environment and will not be evaluated further. Alternatives 3 and 4 also meet the threshold criteria.

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.

Alternatives 2, 3 and 4 comply with SCGs to the extent practicable. Alternative 2 complies with Commercial Use SCOs by installing a minimum one foot of clean cover material on the site. Alternative 3 complies with the Commercial and Restricted Residential Use SCOs by removing fill material and placing a minimum of two feet of clean cover material over remaining contaminated materials (i.e., Solvay waste). Alternative 4 complies with the Unrestricted Use SCOs by removing all contaminated soil.

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 alternative 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.

Alternatives 2, 3 and 4 would provide long-term effectiveness and permanence. However, it would best be accomplished by Alternative 4 through excavation and off-site disposal of all contaminated soils. Alternative 2, through placement of one foot of clean material, a SMP, and an environmental easement would limit the potential for exposure to remaining contaminated material. Alternative 3, through excavation and off-site disposal of fill material and placement of clean material, a SMP, and an environmental easement would be more effective than Alternative 2 at limiting the potential for exposure to contaminated material.

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 would result in a reduction in mobility (i.e., erosion) of COCs in soil/fill material through a cover system. Alternatives 3 and 4 would result in the reduction in volume of soil/fill material at the site. Excavation of historic soil/fill material would result in the removal and off-site disposal of 297,000 cy under Alternative 3. Alternative 4 would remove approximately 1,013,000 cy of soil/fill material exceeding Unrestricted Use SCOs for subsequent off-site disposal. Under all the alternatives, although groundwater may still migrate off-site, the downgradient barrier walls and collection systems that have been installed as part of adjacent site remedies prevent the discharge of contaminated shallow and intermediate groundwater from the site to Onondaga Lake.

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.

Alternatives 2 through 4 would be constructed using proper protective equipment to manage potential risks to on-site workers, and proper precautions and monitoring to be protective of the general public and the environment. Alternative 2 would achieve RAOs in one construction season. Alternative 3 would achieve RAOs in approximately three construction seasons. Alternative 4 would achieve RAOs in approximately nine construction seasons. During these periods, the site vicinity would be subject to construction activities and associated noise, traffic, dust and potential exposure to contaminants. The implementation time frames for Alternatives 3 and 4 would also delay implementation of anticipated future use of the site.

As it relates to traffic, transportation of excavated materials in Alternatives 3 and 4 is anticipated to result in approximately 39,000 to 130,000 trucks trips to and from the site, as compared to 1,100 truck trips under Alternative 2.

Alternatives 2, 3 and 4 have short-term impacts which could be controlled through dust control measures and community air monitoring plans. However, due to the extent of excavation required which result in additional risks to workers and the community, a longer duration to achieve RAOs, significant traffic impacts to the community and significantly greater environmental footprint, Alternatives 3 and 4 would have significantly greater short-term impacts than Alternative 2.

6. Implementability

The technical and administrative feasibility of implementing each alternative are evaluated. For technical feasibility, the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness are evaluated. 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, etc.

Alternative 2 is readily implementable. Alternatives 3 and 4 are significantly more difficult to implement due to the excavation and off-site management of 297,000 to 1,013,000 cy of soil/fill material, construction water management and geotechnical stability concerns.

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 the lowest cost to implement of the alternatives evaluated. Alternatives 3 and 4 are significantly more expensive due to the amount of soil excavation, off-site disposal and backfilling necessary, and are therefore much less cost effective.

8. Land Use

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

Alternative 2 would address soil/fill material exceeding SCOs consistent with current, intended, and reasonably anticipated future use of the property. The one-foot cover system in Alternative 2 would also support anticipated future commercial use. Alternatives 3 and 4, with temporary disruption and possible rerouting of a portion of State Fair Boulevard, Willis Avenue and the CSX rail line, would significantly disrupt current land use and traffic patterns, and the duration of remedy implementation would delay the anticipated future Site redevelopment plans.

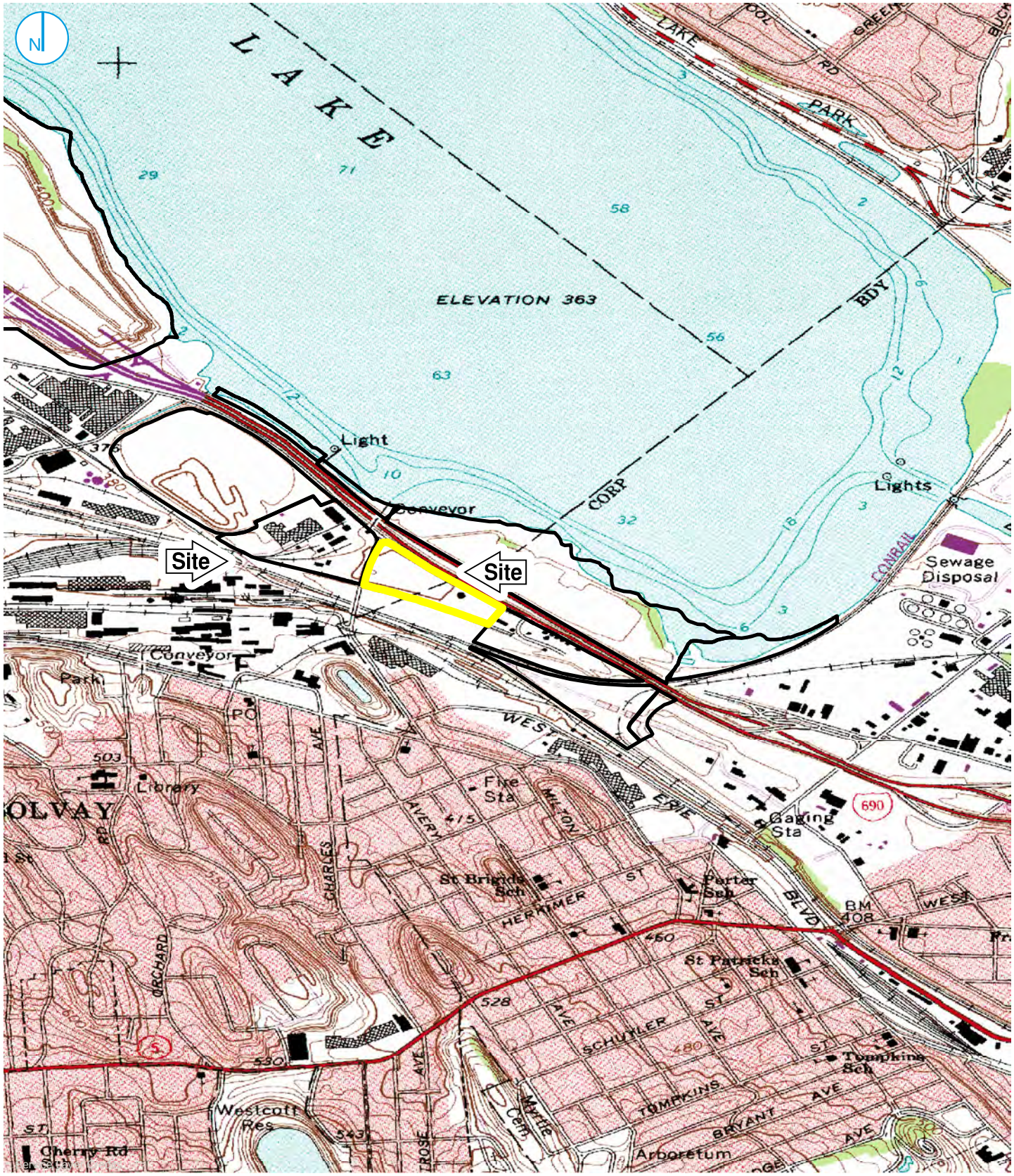
Alternatives 2 and 3 comply with the anticipated use of the site for commercial purposes, and would require an environmental easement. Alternative 3 would also enable restricted residential use of the site due to the thicker layer of clean backfill placed in the excavation and serving as a cover layer over the Solvay waste. Alternative 4 would remove or treat all of the contaminated soil permanently and therefore achieve unrestricted use, which would not require an environmental easement to restrict land use.

9. Community Acceptance

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.

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



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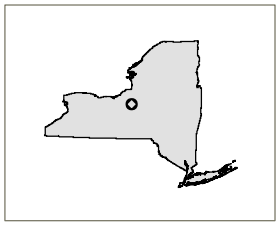

KEY MAP

Map Scale: 1:1:21,324;
Map Center: 76°11'38"W 43°3'52"N

LEGEND

SITE BORDER

0 1,000 2,000 Feet

SITE LOCATION

HONEYWELL
BALLFIELD SITE
GEDDES, NEW YORK

FIGURE 1

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

RAMBOLL

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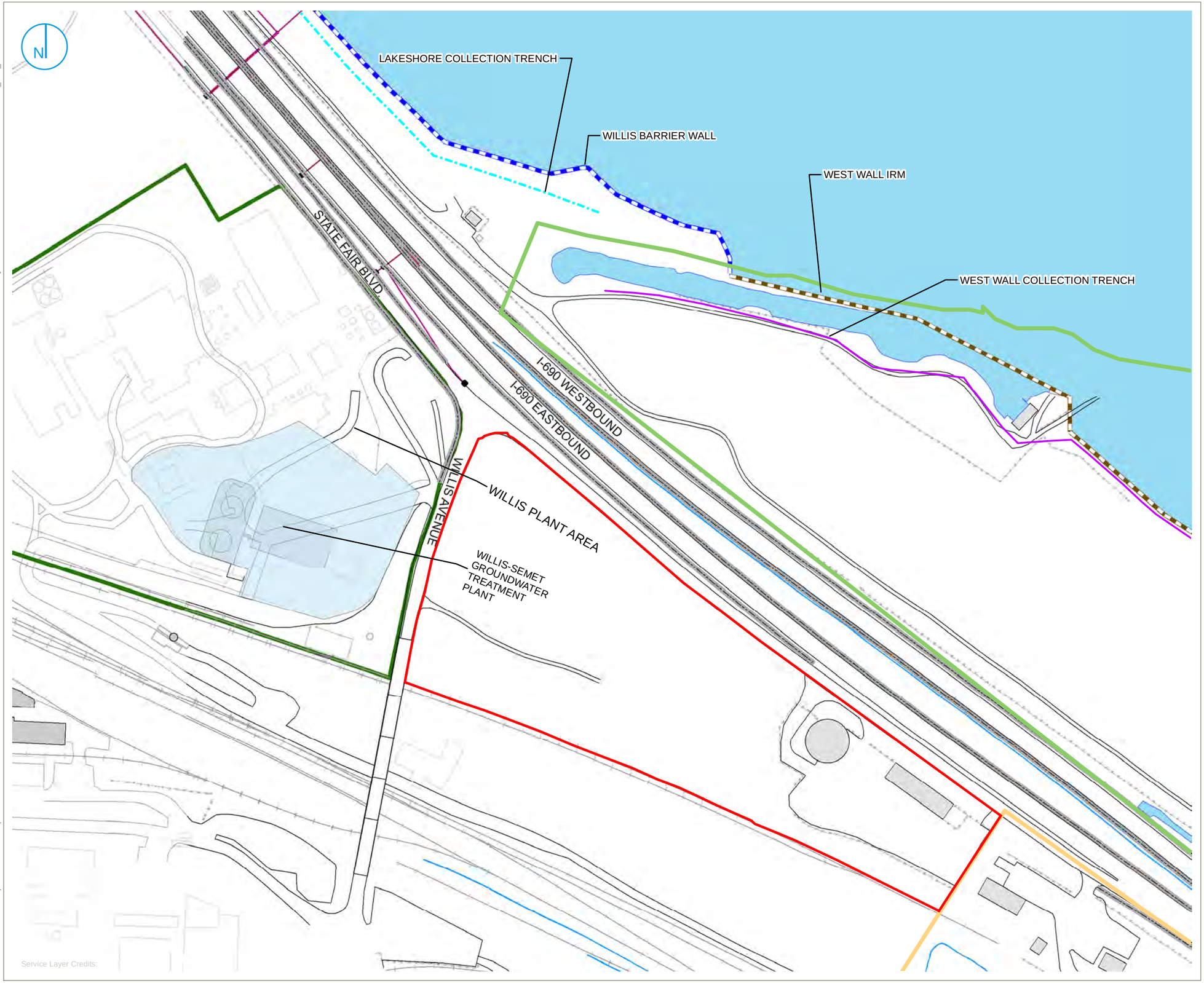

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LEGEND

- SITE BORDER
- LAKESHORE COLLECTION TRENCH
- WILLIS-SEMET GROUNDWATER TREATMENT PLANT FOOTPRINT
- WILLIS AVENUE PLANT BOUNDARY
- WASTEBED B LAKESHORE AREA BOUNDARY
- WASTEBED B PENN-CAN PROPERTY BOUNDARY

0 100 200 Feet

INTERIM REMEDIAL MEASURES

HONEYWELL
BALLFIELD SITE
GEDDES, NEW YORK

FIGURE 2

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

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LEGEND

- CONFIRM CLEAN FILL THICKNESS (1-FT MINIMUM)
- EXCAVATE / REPLACE SWALE AREA (1FT)
- CONFIRM AND AMEND CLEAN FILL THICKNESS (1-FT MINIMUM)
- ENGINEERING COVER (1-FT)
- BALLFIELD BOUNDARY PROPERTY

0 100 200 Feet

ALTERNATIVE 2

HONEYWELL
BALLFIELD SITE
GEDDES, NEW YORK

FIGURE 3

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

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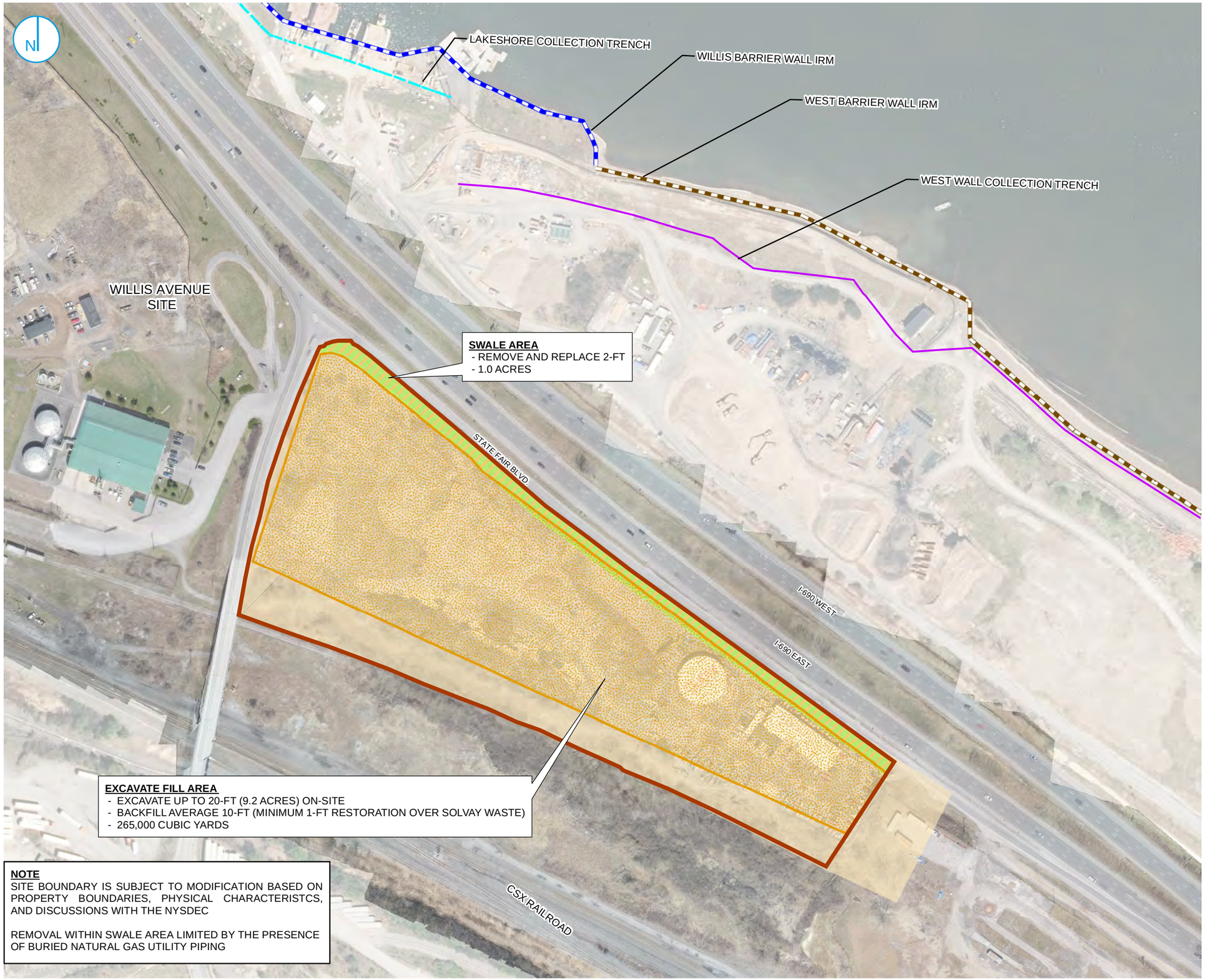

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LEGEND

- WASTEBED C
- APPROXIMATE EXTENT OF FILL
- BALLFIELD SITE
- EXCAVATE / REPLACE SWALE AREA (2-FT)

0 100 200 Feet

ALTERNATIVE 3

HONEYWELL

BALLFIELD SITE

GEDDES, NEW YORK

FIGURE 4

RAMBOLL US CORPORATION

A RAMBOLL COMPANY

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NOTE
SITE BOUNDARY IS SUBJECT TO MODIFICATION BASED ON PROPERTY BOUNDARIES, PHYSICAL CHARACTERISTCS, AND DISCUSSIONS WITH THE NYSDEC

Source: ESRI, NYS ITS GIS Program Office

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LEGEND

- WASTEBED C
- BALLFIELD SITE

0 100 200 Feet

ALTERNATIVE 4

HONEYWELL
BALLFIELD SITE
GEDDES, NEW YORK

FIGURE 5

RAMBOLL US CORPORATION
A RAMBOLL COMPANY