

RESPONSE ACTION DOCUMENT

Wastebed B/Harbor Brook Site
Subsite of the Onondaga Lake Site
Outboard Area Interim Remedial Measure
Onondaga County, New York



New York State Department of Environmental Conservation
and United States Environmental Protection Agency,
Region II

March 2012

I. PURPOSE

The purpose of this document is to authorize a response action¹ to minimize the release of contaminants into Lower Harbor Brook and/or Onondaga Lake under an Interim Remedial Measure (IRM)² for the Wastebed B/Harbor Brook (WBB/HB) Site (Subsite), located in the Town of Geddes and the City of Syracuse, Onondaga County, New York (see Figure 1 for a Site map)³. In September 2011, an Engineering Evaluation/Cost Analysis (EE/CA)⁴ was prepared by Parsons on behalf of Honeywell International, Inc. (Honeywell) in support of the IRM for the Site (*Parsons, 2011*). The EE/CA and a Proposed Response Action Document (PRAD) were made available for public comment from January 20, 2012 through February 20, 2012. The New York State Department of Environmental Conservation (NYSDEC) conducted a public meeting on February 1, 2012 in the Town of Geddes to discuss the proposed response action and to receive public comments on the EE/CA and the PRAD (as part of the citizen participation program for this IRM).

The WBB/HB Outboard Area IRM objectives are to:

- Eliminate, to the extent practicable, releases of contaminants from the Outboard Area; and
- Eliminate, to the extent practicable, potential impacts to human health and to the environment (*e.g.*, to fish and wildlife resources).

Conditions at the Site meet the criteria for a removal action under CERCLA, as documented in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300 (NCP).

1 This response action is a non-time-critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675 (CERCLA).

2 The use of the term “Interim Remedial Measure” (which is a term used in New York State environmental law parlance) throughout this document is not intended to mean that this removal action is a “remedial action” as that term is defined in the federal law CERCLA. An IRM is an activity that is necessary to address either emergency or non-emergency site conditions, which in the short-term, needs to be undertaken to prevent, mitigate or remedy environmental damage or the consequences of environmental damage attributable to a site. An IRM is a non-time critical removal under the CERCLA removal program pursuant to 40 C.F.R § 300. 415(b)(4).

3 Figures referenced in this document can be found in Appendix A, attached hereto.

4 An EE/CA is a study conducted as part of the removal action process to collect necessary data to determine the type and extent of contamination at a site and evaluate response actions to address this contamination.

The Site is a subsite of the Onondaga Lake Site, which is on the National Priorities List (NPL)⁵. There are no nationally significant or precedent-setting issues associated with this action.

The index in Appendix C, attached hereto, identifies the items that comprise the Administrative Record upon which the selection of the response action is based.

The New York State Department of Health was consulted on the planned response action and it concurs with the selected response action (see Appendix D, attached hereto).

II. SITE CONDITIONS AND BACKGROUND

This Response Action Document (RAD) identifies the selected response action for the Site.⁶

A. Site Description

1. Background

The WBB/HB Site is located to the north and south of Interstate Route I-690 in the City of Syracuse and Town of Geddes, Onondaga County. It consists of Harbor Brook, the Lakeshore Area (including Wastedbed B and the East Flume), the Penn-Can Property, the Railroad Area, and areas of study (AOS #1 and AOS #2) east of Harbor Brook (see Figure 2). Wetland SYW-12, located north of Onondaga Creek, is being investigated under the WBB/HB Remedial Investigation/Feasibility Study (RI/FS).

Wastedbed B is a former Solvay wastedbed which received Solvay waste (generated by Allied Chemical Corporation operations) from approximately 1898 to 1926. Wastedbed B covers approximately 28 acres and was engineered to receive waste by construction of a bulkhead into Onondaga Lake. The Penn-Can Property has historically been used for the production and storage of asphalt products. The Barrett Division of the Semet Solvay Company of Allied Chemical Corporation (the predecessor to Honeywell) operated at the property from 1919 until

5 On December 16, 1994, Onondaga Lake and its tributaries and the upland hazardous waste sites which have contributed or are contributing contamination to the lake (subsites) were added to the U.S. Environmental Protection Agency's (EPA's) NPL. NYSDEC and EPA have, to date, organized the work for the Onondaga Lake site into 11 subsites. The Wastedbed B/Harbor Brook Site is one of the subsites at the Onondaga Lake NPL site. NYSDEC is the lead agency for the Wastedbed B/Harbor Brook Site.

6 The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) ID number for the Onondaga Lake Site is NYD986913580. The Wastedbed B/Harbor Brook Site is being tracked in EPA's CERCLIS data base as Operable Unit #18 of the Onondaga Lake NPL Site.

approximately 1978. Barrett produced various asphalt emulsions and some coal tar-based products used in road construction. The Railroad Area is situated to the south of the Penn-Can Property and is bounded to the north, south and east by railroad tracks.

In 2003, Honeywell and NYSDEC entered into an Order on Consent (Index #D7-0008-01-09) to conduct an IRM for WBB/HB. That IRM scope includes a vertical barrier to be installed along the Onondaga Lake shoreline perimeter of Wastedbed B and upstream along the west bank of Harbor Brook with a groundwater collection system installed along the vertical barrier. The location of the barrier wall to the west of Harbor Brook (West Wall) is identified in the final design for the West Wall approved by NYSDEC on December 3, 2009. The remainder of the barrier wall, which is to extend from the eastern terminus of the West Wall, is referred to as the East Wall. The Outboard Area is a 16-acre strip of land that lies between the barrier walls that are being installed as part of the WBB/HB East and West Wall IRMs, and Onondaga Lake (including the mouth of Harbor Brook and areas of wetlands along the shoreline). This IRM, which is the subject of this RAD, addresses the Outboard Area, which includes contaminated soil and wetland sediments from the area between the barrier wall and Onondaga Lake (See Figures 1 and 3).

2. Release or Threatened Release into the Environment of a Hazardous Substance or Pollutant or Contaminant

Based on investigations conducted at the Site pursuant to Section 104 (a)(1)(A) or (B), 42 USC § 9604 (a)(1)(A) or (B), contaminants of concern identified for the Site include metals (antimony, arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc), benzene, toluene, ethylbenzene, and xylene (BTEX), chlorinated benzenes, naphthalene and other polycyclic aromatic hydrocarbons (PAHs), chlordane isomers, DDT and metabolites, dieldrin, and heptachlor/heptachlor epoxide, phenolic compounds, polychlorinated biphenyls (PCBs), and polychlorinated dibenzodioxins/polychlorinated dibenzo-furans.

Coal tar residues, including non-aqueous phase liquid (NAPL), were identified in the eastern central portion of the Penn-Can Property. The coal tar residues are associated with the historic operations of the former paving facilities that were located on the central and eastern portions of the Penn-Can Property. These residues are likely present because of releases from the former Barrett Paving facility previously located on the property. Residues from this source area migrated into the subsurface and then migrated through coarse lenses of marl and along the top of low-permeability (confining) geologic units (*i.e.*, silt/clay and till) to depths of at least 6.1 meters (m) (20 feet [ft]) below ground surface (bgs) in the area of lower Harbor Brook. As shown on Figure 4, these residues, including

NAPL, appear to have migrated to Wastedbed B and Harbor Brook. Groundwater has also been impacted in areas associated with the NAPL. Soils, sediments and surface water have been impacted in areas where shallow and intermediate groundwater discharge to surface water bodies (Harbor Brook, I-690 drainage ditch, and other Site-related ditches). The primary constituents associated with the NAPL include BTEX, and naphthalene and other PAHs.

The sampling results for the media that are the subject of this IRM are further discussed in Section 1.4 of the EE/CA. This document can be found in the document repositories maintained in the NYSDEC Region 7 Syracuse, New York office, Onondaga County Public Library Syracuse Branch at the Galleries, Solvay Public Library, Atlantic States Legal Foundation, and the NYSDEC Albany, New York Central Office.

3. National Priorities List Status

This Site is part of the Onondaga Lake NPL site.

4. Maps, Pictures, and Other Graphic Representation

Figure 4 shows the area of the WBB/HB Site that is the subject of the Outboard Area IRM.

B. Other Actions to Date

1. Previous actions

Previous actions include sampling as part of the WBB/HB Preliminary Site Assessment, RI and IRM Pre-Design.

2. Current actions

An RI for the WBB/HB Site is currently underway. It is anticipated that an FS report and a Proposed Plan for the Site will be released to the public in 2014.

III. THREATS TO PUBLIC HEALTH, OR WELFARE, OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A Streamlined Risk Evaluation (SRE) was prepared for the Outboard Area of the WBB/HB Subsite. The objective of the SRE was to provide a concise evaluation of potential risks to human and ecological receptors, assuming no removal or clean-up actions would be taken at the Outboard Area. The SRE relates to exposure to the contaminated media being addressed by this IRM and the contribution that these media may have made to unacceptable risks in the Outboard

Area. A summary of the human health and ecological evaluations are provided below.

Human Health Evaluation

The intended future use of a portion of the Outboard Area is for habitat enhancements, including wetland improvements. In addition, the area will also likely be used for recreational activities (*e.g.*, biking, running, walking along a trail). Current and future exposure scenarios in the area which were considered in the SRE include trespassers, construction workers, surveillance workers, and recreational visitors. Although unlikely, potential future industrial/commercial workers and residents were also considered in the SRE.

A conservative screening process was applied to identify constituents of potential concern (COPCs) in the surface soil, subsurface soil, and sediment that may pose potential risk to current and future receptors. Some of these COPCs were also previously identified as risk drivers in the Lake based on consumption of fish. Specifically, the SRE identified arsenic, dioxins/furans (2,3,7,8-tetrachlorodibenzo-p-dioxin [2,3,7,8-TCDD] equivalents), mercury, and PCBs as being among the COPCs for surface soil and Harbor Brook sediment, with dioxins/furans exceeding its screening criterion by approximately two or more orders of magnitude. Arsenic, mercury, and PCBs were also identified as COPCs for subsurface soil, with arsenic exceeding its respective screening criterion by more than two orders of magnitude. PCBs were also identified as COPCs for subsurface soil. In the baseline Human Health Risk Assessment (HHRA) for the Lake Bottom Subsite, it was determined that arsenic, dioxins, mercury, and PCBs were the primary risk drivers associated with the consumption of fish from the Lake (TAMS, 2002a). EPA's acceptable risk thresholds were exceeded for both potential cancer and non-cancer risks (*i.e.*, potential cancer risks exceed the 10^{-4} to 10^{-6} risk range and potential non-cancer risks exceeded a hazard index of 1).

Ecological Evaluation

Constituents of potential ecological concern (COPECs) for surface soil and Harbor Brook sediment were identified by screening the maximum detected concentrations in Outboard Area media against recommended, conservative, ecologically-based screening-criteria and/or guidance values.

In surface soil, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, zinc, cyanide, dichlorobenzenes, trichlorobenzenes, xylenes, PAHs, DDT and metabolites, dieldrin, and PCBs exceeded screening criteria, with chromium, iron, lead, mercury, and 4,4'-DDT exceeding their respective criteria by approximately two or more orders of magnitude. These metals and compounds also were identified as surface soil contaminants of concern (COCs) in the Onondaga Lake Baseline Ecological Risk Assessment (BERA; TAMS, 2002b). In addition, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc were among the risk drivers associated with the potential for phytotoxic effects in soil.

Sediment COPECs included metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), benzene, ethylbenzene, toluene, xylenes, chlorobenzenes, PAHs, hexachlorobenzene, phenol, dieldrin, and heptachlor/heptachlor epoxide. These COPECs were also identified as sediment COCs in the Onondaga Lake BERA. Mercury, 2-methylnaphthalene, fluorene, naphthalene, phenol, and chlorobenzene exceeded their respective screening criteria by approximately 2 or more orders of magnitude. In addition, PCBs and dioxins/furans (2,3,7,8-TCDD equivalents) were detected in the Outboard Area sediment and have been identified as sediment COCs in the Onondaga Lake BERA (TAMS, 2002b).

Key results of the Onondaga Lake BERA indicate that comparisons of measured tissue concentrations and modeled doses of chemicals to toxicity reference values show exceedances of hazard quotients for site-related chemicals throughout the range of the point estimates of risk. Site-specific sediment toxicity data indicate that sediments are toxic to benthic macroinvertebrates on both an acute (short-term) and chronic (long-term) basis. Many of the contaminants in the Lake are persistent and, therefore, the risks associated with these contaminants are unlikely to decrease significantly in the absence of remediation. On the basis of these comparisons, it has been determined through the Onondaga Lake BERA that all receptors of concern are at risk. Contaminants and stressors in the Lake have either impacted or potentially impacted every trophic level examined in the Onondaga Lake BERA (NYSDEC and EPA, 2005).

Conclusions

The identification of constituents of potential concern to human health (*i.e.*, COPCs) and potential ecological concern (*i.e.*, COPECs) indicate that there is a potential threat to human health and the environment. Many of these COPCs and COPECs are also identified as COCs in the Onondaga Lake HHRA and BERA. Therefore, the SRE results indicate that there is a clear potential threat to human health from exposure to some constituents found in surface soil, subsurface soil, and sediment. Likewise, there is a potential threat posed to ecological receptors from exposure to surface soil and sediment. Response actions in the Outboard Area evaluated in the EE/CA are warranted based on the following factors acknowledged in 40 CFR Section 300.415 (b)(2):

- Potential threat of exposure to nearby human populations, animals, and the food chain from Site-related contaminants;
- Unacceptable potential risks due to elevated levels of Site-related contaminants in soils and sediment;
- Potential threat to public health, welfare, or the environment;
- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate; and
- Actual or potential contamination of sensitive ecosystems.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in this RAD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. SELECTED ACTIONS AND ESTIMATED COSTS

A. Selected Actions

1. Selected Action Description

The selected response action includes the removal of contaminated soil and sediments and the placement of an isolation cap, which achieves final grades lower than the existing grade elevations to facilitate habitat restoration. Based on the anticipated cap thicknesses and target final grades for the western and eastern Outboard Areas, the majority of the excavation will be conducted to depths ranging from 1.5 to 3 m (4.9 to 9.8 ft) with additional hot spot excavation/dredging to remove an additional 1 m (3.3 ft) (to a maximum depth of 4 m [13.1 ft]) of Outboard Area materials where concentrations of select contaminants exceed the hot-spot criteria developed for the Onondaga Lake remedy (NYSDEC and EPA, 2005)⁷. The cap will be designed to isolate contamination in remaining sediments and soils. The performance criteria for the cap will be the probable effects concentrations developed for the Onondaga Lake remedy for each of the contaminants that have been shown to exhibit acute toxicity on a lake-wide basis (NYSDEC and EPA, 2005), as well as the NYSDEC sediment screening criteria for benzene, toluene, and phenol (NYSDEC, 1999). Habitat restoration in the Outboard Area will create emergent wetland areas and a habitat that is more suitable for northern pike reproduction. The restoration design will consider deeper pools for nursery habitat that coincide with the hot spot removal areas as a means of creating variable topography. If appropriate, additional fill materials will be placed within the Outboard Area to achieve the final post-cap target grades.

It is estimated that 152,000 cubic meters (m³) (199,000 cubic yards [CY]) of material will be removed under the selected response action. Approximately 27,000 m³ (35,000 CY) of dry material will be excavated and relocated to an area

⁷ Based on the results of geotechnical analyses, limitations on the size and depth of the Outboard Area excavation were established to maintain the stability of the walls and nearby structures. Outboard Area excavation limitations are presented in the EE/CA and were considered during the development of potential response actions.

inboard of the barrier wall and groundwater collection system at the WBB/HB Subsite, and the remaining 125,000 m³ (164,000 CY) will be managed with the dredged Onondaga Lake sediments at the Sediment Consolidation Area (SCA) at Wastedbed 13.

This IRM will be coordinated with other remedial activities at the WBB/HB Subsite and the Onondaga Lake bottom remediation. The actual schedule of work will be dependent on how dredging and capping for this area is integrated into the schedule for the Onondaga Lake bottom remediation.

The environmental benefits of the selected response action may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green policy⁸ and NYSDEC's Division of Environmental Remediation Program Policy *Green Remediation* (DER-31)⁹.

2. Contribution to Remedial Performance

This IRM will be performed at the WBB/HB Site, which is part of the Onondaga Lake NPL site. Removing the contaminated soil and sediments and installing an isolation cap as part of this IRM will facilitate the cleanup of Onondaga Lake and Harbor Brook via elimination or control of WBB/HB contaminant sources. It is anticipated that the selected response action, along with the other Site IRMs (West Barrier Wall, East Barrier Wall, and Upper Harbor Brook), will be incorporated into a final remedy for the Site.

3. Description of Alternative Technologies

Not applicable.

4. Engineering Evaluation/Cost Analysis

The EE/CA was prepared to analyze different potential removal actions. The EE/CA was prepared in conformance with the guidelines in Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA (EPA/450-R-93-057, August 1993).

A PRAD (NYSDEC and EPA, 2012), which identified EPA and NYSDEC's preferred response action and the basis for that preference, and the EE/CA were

8 See http://epa.gov/region2/superfund/green_remediation

9 See http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

made available to the public in both the Administrative Record and information repositories maintained in the NYSDEC Syracuse and Albany, New York offices, the Onondaga County Public Library, 447 South Salina Street, Syracuse, New York, the Solvay Public Library, 615 Woods Road, Solvay, New York, and at the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. The documents were also made available on NYSDEC's website at www.dec.ny.gov/chemical/37558.html. On January 20, 2012, a notice of availability for these documents was published in the Syracuse *Post Standard*, and a fact sheet was e-mailed to interested community members via NYSDEC's Onondaga Lake News Listserv. A public comment period was held from January 20, 2012 to February 20, 2012. On February 1, 2012, NYSDEC and EPA conducted a public meeting at the Martha Eddy Room in the Art and Home Center at the New York State Fairgrounds, to present the findings of the EE/CA and answer questions from the public about the Site and the response actions under consideration. Approximately forty people, consisting of residents, representatives of the media, representatives of Honeywell, and local government officials attended the public meeting. Public comments have been addressed in the Responsiveness Summary (see Appendix E, attached hereto).

5. Applicable or Relevant and Appropriate Requirements and Other Environmental Criteria

Applicable or Relevant and Appropriate Requirements (ARARs) and To-Be-Considered criteria (TBCs) related to this Selected Action will be complied with during implementation of the WBB/HB Outboard Area IRM to the extent practicable. The ARARs/TBCs include, but are not limited to those presented on Table 2.

6. Project Schedule

Implementation of this selected response action at the Outboard Area will be coordinated with the Onondaga Lake dredging which is expected to commence in the summer 2012.

B. Estimated Costs

The estimated capital cost, annual operation and maintenance (M&M)¹⁰ cost, Site control costs, and present-worth cost for the WBB/HB Outboard Area IRM are presented below and in Table 1.

Capital Cost	Annual M&M Cost	Present-Worth M&M Cost	Total Present-Worth Cost
\$23,840,000	\$21,100	\$160,600	\$24,000,000

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the IRM were to be delayed or not taken, the Site will continue to pose a potential health risk to human health or the environment.

VII. OUTSTANDING POLICY ISSUES

None.

VIII. ENFORCEMENT

Pursuant to CERCLA, the current owner and operator of a facility from which there is a release of hazardous substances which causes the incurrence of response costs shall be liable for the costs incurred by the United States. CERCLA also provides that persons who previously owned or operated a facility at the time of disposal of hazardous substances are similarly liable. NYSDEC anticipates that the response action will be implemented and funded by Honeywell, a party which has been identified as potentially liable regarding the Site.

IX. AUTHORIZATION

Conditions at the Site meet the NCP Section 300.415(b)(4) criteria for a removal action.

This decision document, which selects a response action for the WBB/HB Outboard Area IRM, located in the Town of Geddes and City of Syracuse, Onondaga County, New York, was

¹⁰ The term “M&M” as used here is meant to be synonymous with the term Operation and Maintenance, which is cited in the NCP, since the response actions do not include facilities which will need operation.

developed in accordance with CERCLA and is not inconsistent with the NCP. The decision documented in this RAD is based on the Administrative Record for the response action.

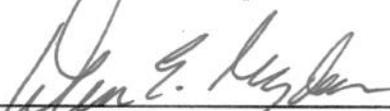
NYSDEC and EPA's selected response action includes removal of contaminated soils and sediments between the Harbor Brook barrier walls (East and West Walls) and Onondaga Lake, placement of an isolation cap, and restoration of the area as wetlands. This response action will be protective of human health and the environment, both in the short- and long-term, and will meet federal and state ARARs/TBCs to the extent practicable. The volume of contaminants will be reduced through the removal of contaminated soils and sediments and is readily implementable. The response action includes an isolation cap, in conjunction with institutional controls and a long-term M&M program, to provide long-term chemical isolation of underlying impacted soil/sediments.

As discussed in the PRAD (see Appendix E-1), NYSDEC and EPA have determined that the selected response action provides the best balance of tradeoffs among the response actions considered in the PRAD with respect to the three evaluation criteria (effectiveness, implementability, and cost). NYSDEC and EPA also believe that the selected response action will be protective of human health and the environment, will comply with ARARs/TBCs to the extent practicable, will be cost-effective, and will utilize permanent solutions and response action treatment technologies or resource recovery technologies to the maximum extent practicable.



Robert W. Schick, Acting Director
Division of Environmental Remediation
New York State Department of Environmental Conservation

MARCH 30, 2012
Date



Walter E. Mugdan, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency

MARCH 29, 2012
Date

References:

New York State Department of Environmental Conservation Division of Fish, Wildlife, and Marine Resources. 1999. *Technical Guidance for Screening Contaminated Sediments*. New York State Department of Environmental Conservation, Albany, New York. January.

New York State Department of Environmental Conservation and United States Environmental Protection Agency. 2005. *Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site*. New York State Department of Environmental Conservation, Albany, New York and United States Environmental Protection Agency, New York, New York. July.

New York State Department of Environmental Conservation and United States Environmental Protection Agency. 2012. *Interim Remedial Measure Outboard Area of the Wastebed B/Harbor Brook Proposed Response Action Document*. New York State Department of Environmental Conservation, Albany, New York and United States Environmental Protection Agency, New York, New York. January.

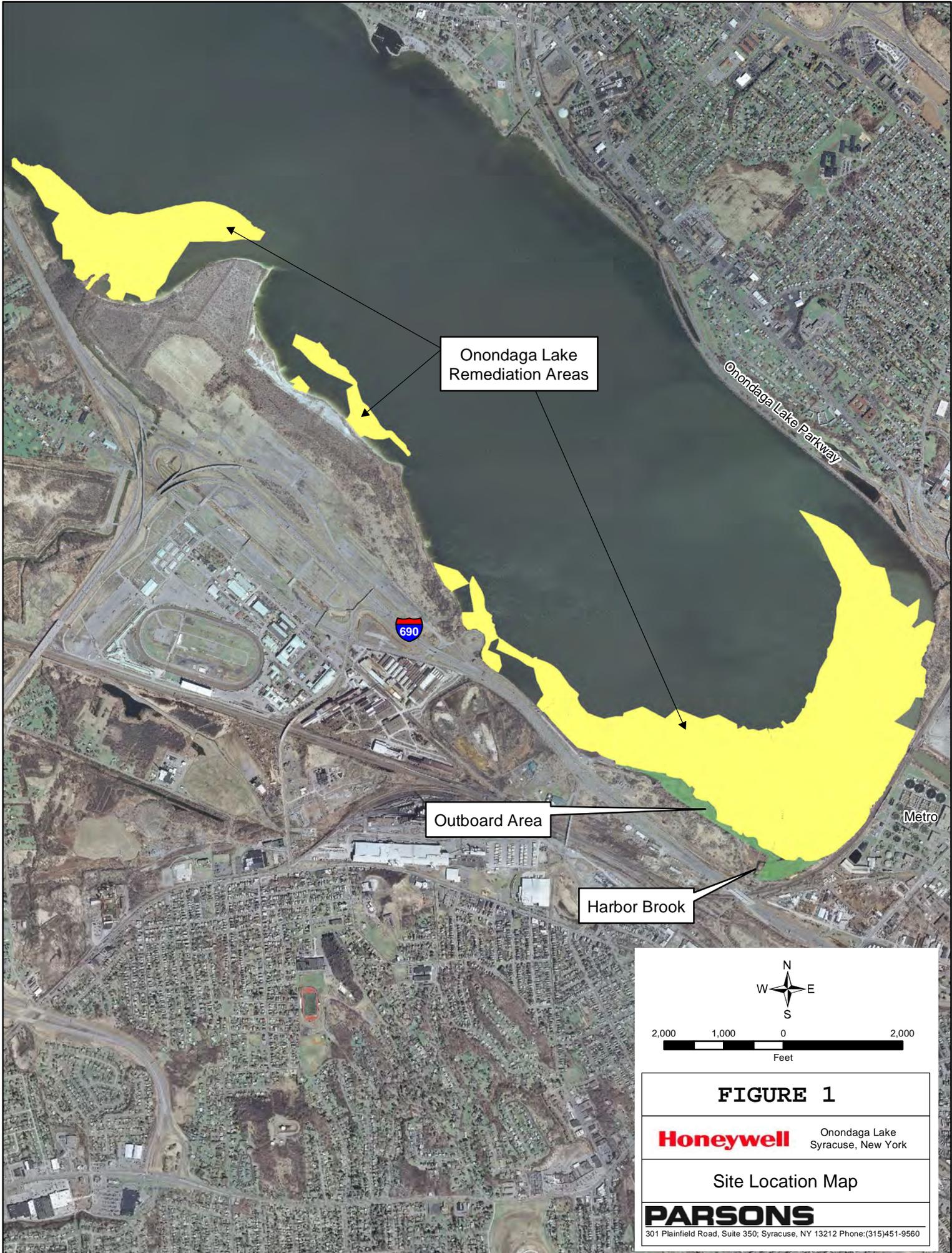
Parsons. 2011. *Engineering Evaluation/Cost Analysis (EE/CA), Wastebed B/Harbor Brook Outboard Area*. Parsons, Syracuse, New York. September.

TAMS. 2002a. *Onondaga Lake Human Health Risk Assessment*. TAMS, New York, New York and YEC, Valley Cottage, New York. Prepared for NYSDEC. December.

TAMS. 2002b. *Onondaga Lake Baseline Ecological Risk Assessment*. TAMS, New York, New York and YEC, Valley Cottage, New York. Prepared for NYSDEC. December.

APPENDIX A

Figures



Onondaga Lake
Remediation Areas

Outboard Area

Harbor Brook



FIGURE 1

Honeywell Onondaga Lake
Syracuse, New York

Site Location Map

PARSONS

301 Plainfield Road, Suite 350, Syracuse, NY 13212 Phone:(315)451-9560



- Willis/Semet IRM Barrier Wall
- West Wall Portion of the WBB/HB IRM
- East Wall Portion of the WBB/HB IRM
- NYSDEC/EPA Approved Wetland Boundaries
- Sediment Management Unit (SMU) Boundary
- Area Backfilled to Elevation 365 ft.
- Dredge Spoils Area

Note: The East Flume has subsequently been filled in to elevation 365 (NAVD 88).

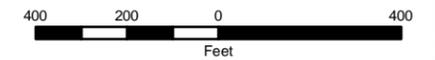


FIGURE 2

Honeywell Onondaga Lake
Syracuse, New York

East Flume, DSA #2, AOS-1
and Wetland Areas

PARSONS
301 Plainfield Road, Suite 350, Syracuse, NY 13212 Phone: (315)451-9560



-  Willis/Semet IRM Barrier Wall
-  West Wall Portion of the WBB/HB IRM
-  East Wall Portion of the WBB/HB IRM
-  Sediment Management Unit (SMU) Boundary
-  Wastedbed B/Harbor Brook Site Boundary



Note: The East Flume has subsequently been filled in to elevation 365 (NAVD 88).



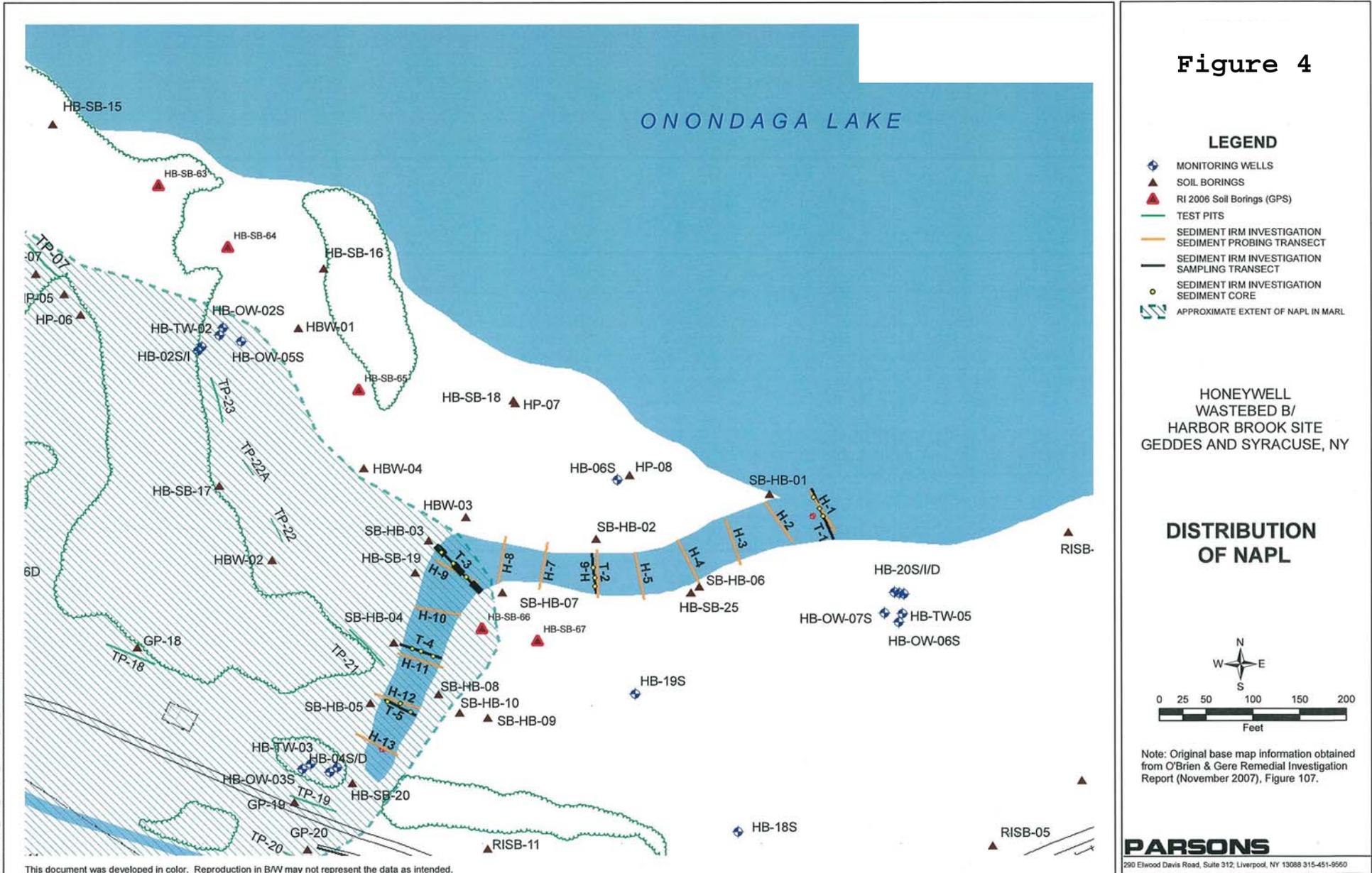
FIGURE 3

Honeywell Onondaga Lake
Syracuse, New York

Wastedbed B/Harbor Brook Site
and Outboard Area

PARSONS
301 Plainfield Road, Suite 350; Syracuse, NY 13212 Phone: (315)451-9560

Figure 4



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PARSONS
290 Elwood Davis Road, Suite 312, Liverpool, NY 13088 315-451-9560

APPENDIX B

Tables

Table 1
Wastebed B/Harbor Brook Outboard Area IRM
Selected Action Cost Summary

Removal for Cap Placement, Hot Spot Excavation, and Habitat Restoration		Cost
	Capital Cost	\$23,840,000
	Annual M&M Costs	\$21,100
	Present-Worth M&M Cost	\$160,600
	Total Present Worth Cost	\$24,000,000

Notes: From Wastebed B/Harbor Brook Outboard Area Engineering Evaluation/Cost Analysis (Parsons, 2011). Feasibility Study level accuracy (+50% / -30%).

Capital cost included the following: 15% contingency (of construction costs), and 10% engineering, design, and construction oversight.

Table 2
Wastebed B/Harbor Brook Outboard Area IRM
ARARs/TBCs

<i>Medium/ Authority</i>	<i>Citation</i>	<i>Requirement Synopsis</i>
New York State Environmental Conservation Law (ECL)	ECL Article 15, Title 3 and Article 17, Titles 3 and 8, 6 NYCRR 701 - Classifications - Surface Waters and Ground Waters	Establishes classifications for surface waters and groundwater.
	ECL Article 15, Title 3 and Article 17, Titles 3 and 8, 6 NYCRR Part 703 - Class GA Groundwater Quality Standards	Establishes surface water and groundwater quality standards and groundwater effluent limitations.
	ECL Article 24, Title 7, 6 NYCRR 663 - Freshwater Wetland Permit Requirements	Establishes standards governing the issuance of permits to alter or fill freshwater wetlands.
	ECL Article 24, Title 7, New York State Freshwater Wetlands Implementation Program, 6 NYCRR 662 and 665	Defines procedural requirements for undertaking different activities in and adjacent to freshwater wetlands.
	ECL Article 1, Section 0101; Article 27, Titles 13 and 14; Article 52, Title 3; Article 56, Title 5; Article 71, Title 36; Article 3, Section 0301; Chapter 1, laws of 2003; Chapter 577, laws of 2004 and State Finance Law Article 6, Section 97-b, 6 NYCRR Part 375-6	Establishes New York State Remedial Program Soil Cleanup Objectives
	ECL Article 24; Article 71, Title 23	Provisions of Article 71, Title 3 are applicable to the enforcement of Article 24. Where any freshwater wetlands have been damaged or endangered by pollution or are subject to pollution, the commissioner shall take all appropriate action to abate the pollution.
	ECL Article 15, Title 5, 6 NYCRR 608 - Use and Protection Of Waters	Protection of Waters Program
	ECL Article 27, Title 7, 6 NYCRR 360 - Solid Waste Management Facilities	Solid Waste Management Facilities New York State regulations for design, construction, operation, and closure requirements for solid waste management facilities.
NYSDEC	NYSDEC, Division of Water Technical and Operational Guidance Series (TOGS) Memo 1.1.1 - Ambient Water Quality Standards and Guidance Values (1998, 1999a, April 2000, June 2004)	Provides guidance for ambient water quality standards and guidance values for pollutants.
NYSDEC Division	Technical Guidance for Screening Contaminated Sediment. (Jan 1999)	Includes a methodology to establish sediment criteria for the purpose of identifying

Table 2
Wastebed B/Harbor Brook Outboard Area IRM
ARARs/TBCs

<i>Medium/ Authority</i>	<i>Citation</i>	<i>Requirement Synopsis</i>
of Fish, Wildlife and Marine Resources		contaminated sediments. Provides sediment quality screening values for non-polar organic compounds, such as PCBs, and metals to determine whether sediments are contaminated (above screening criteria) or clean (below screening criteria). Screening values are not cleanup goals. Also discusses the use of sediment criteria in risk management decisions.
US Army Corps of Engineers (USACE)	Clean Water Act, Section 404, 33 U.S.C. § 1344, 33 Code of Federal Regulations (CFR) Parts 320 – 330	USACE approval is generally required to excavate or fill, or in any manner to alter or modify the course, location, condition, or capacity of the channel of any navigable water of the United States.
	Clean Water Act, Section 404, 33 U.S.C. § 1344, 40 CFR Parts 230 – 231	Guidelines for Specification of Disposal Sites for Dredged or Fill Material. Except as otherwise provided under Clean Water Act Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. Includes criteria for evaluating whether a particular discharge site may be specified.
Office of the President	Executive Order 11988—Floodplain Management, 42 Federal Register 26951 (May 24,1977)	Executive Order 11988: Protection of Wetlands requires federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands if a practicable alternative exists. Federal agencies are required to avoid adverse impacts or minimize them if no practicable alternative exists.
	Executive Order 11990—Protection of Wetlands, 42 Federal Register 26961 (May 24,1977)	Executive Order 11990: Floodplain Management requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. Federal agencies are required to avoid adverse impacts or minimize them if no practicable alternative exists.
EPA Office of Solid Waste and	August 1985 Policy on Floodplain and Wetland Assessments for Comprehensive Environmental	Superfund actions must meet the substantive requirements of the Floodplain Management Emergency Executive Order (E.O. 11988) and

Table 2
Wastebed B/Harbor Brook Outboard Area IRM
ARARs/TBCs

<i>Medium/ Authority</i>	<i>Citation</i>	<i>Requirement Synopsis</i>
Emergency Response (OSWER)	Response, Compensation, and Liability Act (CERCLA) Actions (OSWER Directive 9280.0-02)	the Protection of Response 1985 Wetlands Executive Order (E.O. 11990). This memorandum discusses situations that require preparation of a floodplain or wetlands assessment and the factors that should be considered in preparing an assessment for response actions taken pursuant to Section 104 or 106 of CERCLA.
National Historic Preservation Act, 16 U.S.C. § 470 et seq.	36 CFR 800	Remedial Actions must take into account effects on properties in or eligible for inclusion in the National Registry of Historic Places.
	36 CFR Part 65	National Historic Landmarks Program.
New York State Historic Preservation Act of 1980	9 NYCRR Parts 426 – 428	The act created the New York State Register of Historic Places, the official list of sites, buildings, structures, areas or objects significant in the history, architecture, archeology or culture of the state, its communities or the nation. The Act declares historic preservation to be the public policy and in the public interest of the state.
33 U.S.C. 1341	Clean Water Act Section 401	State Water Quality Certification Program
16 U.S.C. 661	Fish and Wildlife Coordination Act	Whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose, by any department or agency of the United States, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular State in which the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources.
Federal Resource Conservation and Recovery Act	40 CFR Part 257	Establishes criteria for Classification of Solid Waste Disposal Facilities and Practices

APPENDIX C

Administrative Record Index

Administrative Record Index
Wastebed B/Harbor Brook East Barrier Wall IRM

<p>Documents in Support of the IRM Activities</p>	<p>Wastebed B/Harbor Brook IRM Consent Order (December 2003)</p> <p>Wastebed B/Harbor Brook IRM Work Plan (July 2004)</p> <p>Wastebed B/Harbor Brook Outboard Area Addendum Hot Spot Investigation Data Summary Report (April 2011)</p> <p>Draft Onondaga Lake Capping, Dredging, Habitat and Profundal Zone (Sediment Management Unit 8) Draft Final Design (August 2011)</p> <p>Wastebed B/Harbor Brook Outboard Area Engineering Evaluation/Cost Analysis (September 2011)</p> <p>NYSDEC Comments on “Draft Onondaga Lake Capping, Dredging, Habitat, and Profundal Zone (Sediment Management Unit 8) Draft Final Design,”(December 21, 2011)</p> <p>Proposed Response Action Document for the Wastebed B/Harbor Brook Site Outboard Area IRM (January 2012)</p>
<p>Documents in Support of Streamlined Risk Evaluation</p>	<p>Onondaga Lake Human Health Risk Assessment. (December 2002)</p> <p>Onondaga Lake Baseline Ecological Risk Assessment. (December 2002)</p> <p>Onondaga Lake Bottom Subsite/Onondaga Lake Superfund Site Record of Decision. (July 2005)</p> <p>Wastebed B/Harbor Brook Site Human Health Risk Assessment. (October 2009)</p> <p>Wastebed B/Harbor Brook Baseline Ecological Risk Assessment. (August 2011)</p>

APPENDIX D

NYSDOH Letter of Concurrence

NEW YORK
state department of
HEALTH

Nirav R. Shah, M.D., M.P.H.
Commissioner

Sue Kelly
Executive Deputy Commissioner

December 6, 2011

Mr. Dale Desnoyers, Director
Division of Environmental Remediation
NYS Department of Environmental Conservation
625 Broadway - 12th Floor
Albany, NY 12233-7011

Re: Proposed Response Action Document
Wastebed B/Harbor Brook Outboard Area
Site #734075
Syracuse (C), Onondaga County

Dear Mr. Desnoyers:

At the New York State Department of Environmental Conservation's request, we have reviewed the U.S. Environmental Protection Agency's *Proposed Response Action Document* (November 2011) for the above-referenced site. Specifically, we have reviewed the document to determine whether the proposed Interim Remedial Measure (IRM) is protective of public health. I understand that environmental investigations of the site have identified contamination in soil, sediment, and in groundwater that discharges to surface water bodies (Harbor Brook, drainage ditches, Onondaga Lake). Human exposures to this contamination would be addressed by the proposed IRM as follows.

- Contaminated soils and wetland sediments located between the Harbor Brook barrier walls and Onondaga Lake would be removed and replaced with clean soils to form an isolation cap in order to re-establish habitat around planned wetlands as part of the Onondaga Lake restoration effort. The various layers of the cap would include a habitat layer (vegetated), an erosion protection layer (where necessary), a chemical isolation layer, and an allowance for mixing of the bottom of the chemical isolation layer with the underlying soil/sediment.
- Operation, maintenance and monitoring of the capped areas would be performed to verify that the overall integrity of the cap is maintained as designed. Institutional controls for the site would be formulated and implemented for permitting potential future activities (e.g., recreation) at the site.

Based on this information, I concur with the proposed IRM as it will prevent human exposures to contaminated soil and sediment along the lakeshore and eliminate or reduce, to the extent practicable, adverse ecological effects to the benthic and terrestrial community. If you have any questions, please contact me or Mr. Geoffrey Laccetti at (518) 402-7860.

Sincerely,

A handwritten signature in black ink, appearing to read "Steven M. Bates". The signature is fluid and cursive, with a long horizontal stroke at the end.

Steven M. Bates, Acting Director
Bureau of Environmental Exposure Investigation

ec: A. Salame-Alfie, Ph.D.
K. Anders / G. Laccetti / File
J. Strepelis - CNYRO
K. Zimmerman / L. Letteney - OCHD
A. Daniels / R. Schick / W. Daigle - NYSDEC, Central
H. Warner - NYSDEC, Region 7

APPENDIX E

Responsiveness Summary

RESPONSIVENESS SUMMARY

Wastebed B/Harbor Brook Outboard Area IRM

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the proposed Wastebed B/Harbor Brook Site/Outboard Area Interim Remedial Measure (IRM) and the responses of the New York State Department of Environmental Conservation (NYSDEC) and U.S. Environmental Protection Agency (EPA). All comments summarized in this document have been considered in NYSDEC and EPA's final decision in the selection of a response action to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

A September 2011 Engineering Evaluation/Cost Analysis (EE/CA), which identified and evaluated response actions for the Wastebed B/Harbor Brook Site/Outboard Area, and a January 2012 Proposed Response Action Document (PRAD), which identified the response action preferred by NYSDEC and EPA and the basis for that preference, were made available to the public in both the Administrative Record and information repositories maintained in the NYSDEC's Albany, New York and Region 7 Syracuse, New York offices and at local information repositories at the Onondaga County Public Library, 447 South Salina Street, Syracuse, New York, the Solvay Public Library, 615 Woods Road, Solvay, New York, and at the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. The documents were also made available on NYSDEC's website at www.dec.ny.gov/chemical/37558.html. On January 20, 2012, a notice of availability of these documents was published in the Syracuse *Post Standard* and was e-mailed to interested community members via NYSDEC's Onondaga Lake News Listserv. A public comment period was held from January 20, 2012 to February 20, 2012. On February 1, 2012, NYSDEC conducted a public meeting at the Martha Eddy Room in the Art and Home Center at the New York State Fairgrounds, to present the findings of the EE/CA and answer questions from the public about the Site and the response actions under consideration. Approximately forty people, consisting of residents, representatives of the media, representatives of Honeywell, and local government officials, attended the public meeting.

OVERVIEW

NYSDEC and EPA's selected IRM includes excavation and/or dredging of soil and sediment between the Harbor Brook barrier walls and Onondaga Lake, installation of an isolation cap to physically isolate the contaminated soil/sediment from the environment following soil/sediment removal, and restoration and enhancement of wetland habitat (as a pike spawning wetland). Responses to the comments received at the public meeting and in writing during the public comment period are summarized below. Attached to this Responsiveness Summary are the following Appendices:

- Appendix E-1 - Proposed Response Action Document (January 2012)
Appendix E-2 - Public Notice published in the *Post Standard* on January 20, 2012
Appendix E-3 - Letters Submitted During the Public Comment Period

SUMMARY OF COMMENTS AND RESPONSES

A summary of the comments provided at the February 1, 2012 public meeting and contained in the letters and e-mails that were received during the public comment period, as well as EPA, NYSDEC, and New York State Department of Health's responses to them, are provided below:

Comment #1: What does "outboard" mean? Does it mean the other side of the wall?

Response #1: Yes, "Outboard" means lakeside of the barrier wall. The "Outboard Area" refers to that part of the Wastedbed B Lakeshore Area that is lakeside of the barrier wall.

Comment #2: The proposed response action should be rejected as it would allow for Honeywell waste to remain in place. The appropriate action is one that would call for the excavation and removal of all waste and contaminated soil/sediment from the site.

Response #2: The selected action for the Outboard Area IRM will be protective of human health and the environment. In addition, as part of the designs for the East and West Wastedbed B/Harbor Brook barrier walls, comprehensive geotechnical analyses were conducted to determine what kind of impacts future excavation activities within the Outboard Area might have on the stability of the walls and nearby structures (*e.g.*, railroads, sewer lines). Based on the results of the geotechnical analyses, limitations on the size and depth of Outboard Area excavations are necessary to maintain the stability of the walls and the nearby structures. These excavation limitations restrict the removal of all of the contaminated materials from the Outboard Area. The selected response action does include the removal of soils and sediments to depths ranging from 1.5 to 3 m (4.9 to 9.8 ft) with additional hot spot excavation/dredging to remove an additional 1 m (3.3 ft) (to a maximum depth of 4 m [13.1 ft]) of Outboard Area materials where higher concentrations of select contaminants have been detected. The removal will be followed by the installation of an isolation cap to physically isolate the contaminated soil/sediment from the environment and restoration/enhancement of the area as wetland habitat (a pike-spawning wetland).

Comment #3: The area inboard (landward) of the steel inserts intended to contain polluted land/water needs to be treated. If not, the materials will eventually, if they have not already, sink low enough to cross under the barriers into the lake. Also, since the area will be for public use, removal of contaminated materials is essential.

Response #3: The barrier wall was installed so that its bottom is keyed into a silt and clay low-

permeability (confining) geologic unit by at least 3 feet (ft) (0.9 meters [m]). As such, contamination inboard of the barrier wall will not migrate under the barrier and move toward the lake. Groundwater will be collected from behind the wall (to maintain the appropriate hydraulic gradient) and will be treated prior to discharge to the lake. The potential need for treatment of any contaminants present in soils inboard of the barrier wall will be addressed under the ongoing Wastebed B/Harbor Brook remedial investigation and feasibility study (RI/FS). As noted above, removal of all of the contaminated materials from the Outboard Area is not feasible. Also see the response to Comment #2, above.

Comment #4: Where is the Penn-Can Property located and what activities took place there?

Response #4: The Penn-Can Property is located on the eastern portion of the Wastebed B/Harbor Brook site between the Lakeshore Area and the Railroad Area. This property has historically been used for the production and storage of asphalt products. The Barrett Division of the Semet Solvay Company of Allied Chemical Corporation (predecessor to Honeywell) operated at the property from 1919 to approximately 1978. Barrett produced various asphalt emulsions and some coal tar-based products used in road construction. The property is currently used for the storage of equipment and other commercial uses.

Comment #5: What are non-aqueous phase liquids (NAPLs)?

Response #5: NAPLs are materials that are generally immiscible with water, meaning that they form a separate liquid phase. Coal-tar based NAPLs were identified in the eastern central portion of the Penn-Can Property and appear to have migrated to other areas including a portion of the Lakeshore Area. The primary constituents associated with the coal-tar based NAPLs include benzene, toluene, ethylbenzene, and xylene, and naphthalene and other polycyclic aromatic hydrocarbons. Chlorobenzene NAPLs are located on the western portion of the Lakeshore Area and are related to operations at the former Willis Avenue Chlorobenzene Plant and historic East Flume discharges.

Comment #6: How does the Outboard Area of the Wastebed B/Harbor Brook site relate to the Willis Avenue site?

Response #6: The Wastebed B/Harbor Brook site and the Willis Avenue site are adjacent subsites of the Onondaga Lake site. The two sites are being addressed independently; there are separate RI/FSs being conducted for each site and separate IRMs have been, are being, or will be implemented at the sites. The Willis Avenue site was historically one of several likely sources of site-related contaminants on the Wastebed B/Harbor Brook site.

Comment #7: How many hot spot areas are there and how were they identified? What are the criteria for the hot spots and were they based on averaging? What is the composition of the hot spots?

Response #7: Two hot spot areas were identified in the western part of the Outboard Area. The hot spot areas are areas where detected sediment concentrations exceed sediment criteria (i.e., hot spot criteria) within the 1-m interval below the base excavation required for cap placement and habitat restoration, but above the maximum excavation limits established for stability. The hot spot criteria are exceeded in the two areas for dichlorobenzene and xylene. These hot spot criteria were developed as part of the Onondaga Lake Record of Decision. The methods for delineating the hot spot areas are included in Appendix D of the EE/CA.

Comment #8: How many dump trucks would be needed to transport 200,000 cubic yards (cy) of contaminated soil/sediments?

Response #8: It is anticipated that only approximately 35,000 cy of soil/sediment from dry areas will need to be transported via truck within the limits of the Wastedbed B/Harbor Brook site (not on public roads). As a standard dump truck typically can carry 20 cy, approximately 1,750 trips via truck will be needed to transport the 35,000 cy of sediments. The remaining soil/sediment removed from the Outboard Area (approximately 165,000 cy) will be hydraulically dredged and transported via pipeline and consolidated at the SCA at Wastedbed 13 as part of the Onondaga Lake Bottom Subsite remedy. Trucks will not be used for transporting hydraulically dredged Outboard Area soils/sediment to the SCA. If, however, all of the sediments were being transported by trucks, then approximately 10,000 truck trips would be needed to transport the 200,000 cy of sediments anticipated to be removed from the Outboard Area.

Comment #9: Is there a collection system upgradient of the barrier wall?

Response #9: A groundwater collection system has been constructed upgradient of the barrier wall as part of the Wastedbed B/Harbor Brook IRM.

Comment #10: How deep is the contamination?

Response #10: Sampling in the Outboard Area was conducted at depths to 6 m (19.7 ft) or less. While contaminants were detected in the subsurface at a depth between 5 m (16.4 ft) and 6 m (19.7 ft) in several locations, contaminant concentrations found at this depth were generally lower than contaminant levels found at shallower depths.

Comment #11: What will the cap be made of? What will it look like?

Response #11: To ensure that the cap will provide long-term protection of human health and the environment, the cap will include several layers dedicated to various purposes. These layers will include, from top to bottom, a habitat layer, an erosion protection layer, a chemical isolation layer, and to allow for mixing of the bottom of the chemical isolation layer with the underlying existing lake sediment, a mixing layer. The habitat layer will be comprised of topsoil and will

include organic carbon for habitat considerations. The erosion protection layer will consist of coarse or fine gravel. The chemical isolation and mixing layers will be comprised of medium sand, and to enhance cap effectiveness, activated carbon. In the western portion of the Outboard Area, where the elevated pH material is to be capped, the chemical isolation and mixing layers will include siderite, a naturally-occurring mineral composed mostly of iron carbonate, to enhance microbial degradation of contaminants. This cap design is consistent with the Onondaga Lake Bottom cap.

Comment #12: What are the capping depths? How long will the cap be effective?

Response #12: Based on the anticipated cap thicknesses and target final grades for the western and eastern Outboard Areas, excavation will be conducted to depths ranging from 1.5 m (4.9 ft) to 3 m (9.8 ft), and at an average depth of 2 m (6.6 ft), in order to facilitate placement of the cap and achieve final target grades. An additional 1 m of material will be removed from designated hot spot areas. The design minimum cap thickness for the Outboard Area is 3.3 ft (1 m) with anticipated thicknesses based on over-placements of each layer of 4.4 ft (1.3 m) and 4.1 ft (1.2 m) in the West and East areas, respectively. The final grades for the cap will be lower than the existing grade elevations to facilitate habitat restoration. It is anticipated that the cap will be effective for 1,000 years or more.

Comment #13: Is the Harbor Brook diversion permanent?

Response #13: The Harbor Brook diversion outside of the barrier wall is permanent. Under the Wastebed B/Harbor Brook East Wall IRM, a portion of the lower reach of Harbor Brook was relocated to the east of its former location so that it is outside of the site area impacted by NAPL. The effort included the creation of a new section of Harbor Brook, backfilling of an existing section, and replacement of the downstream culvert. The final design for the Outboard Area, which will include the specific design details on the relocated segment of the Harbor Brook channel, will be included in the final Capping, Dredging, Habitat, and Profundal Zone design for the Lake Bottom Subsite.

Comment #14: Will the isolation layer be low enough to allow the new Harbor Brook to meander on its own?

Response #14: The isolation and habitat layer elevation will be based on targeted finish grade elevations. Although there is no intention to prevent meandering of Harbor Brook, meandering of the stream is not anticipated given the required erosion controls (i.e., cap erosion protection layer and stream bed erosion protection) and the reduced flow velocities because of the hydraulic influence of the lake on the lower portion of Harbor Brook. It should also be noted a significant portion of the outboard area will be flooded during peak flow seasons which will further dissipate stream flow conditions.

Comment #15: Have you decided how to clean up the site yet? Is there still a possibility that waste behind the wall might be removed?

Response #15: The RI/FS for the Wastedbed B/Harbor Brook site is underway. The potential need for additional remedial work (e.g., addressing the materials behind the wall) will be evaluated in a Proposed Plan that will be developed by DEC/EPA and released for public comment.

Comment #16: Is the northern pike spawning area a result of outreach efforts?

Response #16: The northern pike spawning area is one of many habitat design features in the Onondaga Lake Habitat Restoration Plan developed by Honeywell. The plan was developed with extensive input from members of the Lake Bottom Habitat Technical Work Group, which included representatives from NYSDEC's Bureau of Remediation and Division of Fish, Wildlife and Marine Resources, EPA, the United States Fish and Wildlife Service, the State University of New York College of Environmental Science and Forestry, and Mississippi State University. This team of local and national experts encompasses experience in the areas of wetland ecology, limnology, biology, restoration ecology, fisheries biology and sediment remediation. Input was also provided by the Onondaga Nation and local habitat and environmental organizations such as Salt City Bassmasters, Izaak Walton League of America, Audubon Society, Ducks Unlimited, and Citizen's Campaign for the Environment during the preparation of the habitat restoration plan.

Comment #17: Will there be opportunity for public input regarding the future use of the Outboard Area?

Response #17: The property is owned by Honeywell so it will determine future use of the Outboard Area within the constraints of local land use ordinances. However, community input will be a key factor in determining additional future plans for and uses of the area.

Comment #18: Does the Old Erie Canal go through this site?

Response #18: No, the Old Erie Canal formerly traversed an area south of the Wastedbed B/Harbor Brook site.

Comment #19: Where will collected groundwater be treated? Has the discharge water been tested for benzene?

Response #19: Collected groundwater will be treated at the Willis Avenue wastewater treatment facility. In accordance with State Pollutant Discharge Elimination System (SPDES) discharge requirements, treated groundwater at the facility is sampled and analyzed for benzene and other hazardous substances in order to ensure that treated groundwater meets the required discharge

limits.

Comment #20: Is there documented history of what was dumped?

Response #20: There are site documents which provide some information on the raw materials and manufacturing processes that were employed, waste materials that were generated, and the waste management practices and disposal locations that were utilized. This information was considered in the planning and development of site investigation activities.

Comment #21: What is the status of the work at the East Flume, which is located on the western portion of the Outboard Area?

Response #21: The East Flume was originally an excavated drainage ditch that carried a combined (Solvay, sanitary, mercury, and organic) waste stream from the Main Plant and the Willis Avenue Plant into Onondaga Lake. Under prior conditions, these flows were directed to the pond, called the Upper East Flume (UEF), and overflowed a spillway to a narrow stream channel, called the Lower East Flume (LEF), which then discharged to Onondaga Lake. Until recently, there were two pipes conveying discharge to the UEF (60-inch and 72-inch in diameter). The 60-inch discharge pipe no longer discharges to the UEF. It is currently used for utility conveyance (e.g., fiber optic, water lines). All flow is now conveyed through a new 48-inch pipe, which was placed within the 72-inch pipe and the annular space was grouted. This 48-inch pipe discharges through the existing Willis Barrier Wall directly to Onondaga Lake under a New York State Pollutant Discharge Elimination System permit. This work was completed as part of the East Flume IRM in 2010. A portion of the West Wall has been installed within the UEF. The UEF has been filled and portions of the spillway have been demolished to install the work platform, barrier wall, and collection trench. Flow to the LEF now consists of only surface runoff that discharges to the channel along its length. The area of the East Flume that is on the lakeside of the West Wall is considered part of the Outboard Area and will be addressed under the Outboard Area IRM.

Comment #22: Is the Murphy's Island portion of the site part of this remediation plan? If so, is Honeywell committed to remediating it?

Response #22: Murphy's Island will not be addressed under the Outboard Area IRM. It is being evaluated under the ongoing Wastebed B/Harbor Brook RI/FS. Once a remedy is selected, NYSDEC will seek to enter into negotiations with Honeywell to implement the remedy.

Appendix E-1
January 2012 Proposed Response Action Document



Interim Remedial Measure Outboard Area of the Wastebed B/Harbor Brook Site Subsite of the Onondaga Lake Site Onondaga County, New York



January 2012

PURPOSE OF THIS DOCUMENT

This Proposed Response Action Document (PRAD) describes the response actions considered for addressing the release of contaminants into Harbor Brook and/or Onondaga Lake under an Interim Remedial Measure (IRM)¹ and identifies the preferred response action.

This document was developed by the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (EPA). NYSDEC and EPA are issuing this document as part of its public participation responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The response actions summarized here are described in more detail in the Wastebed B/Harbor Brook Outboard Area Engineering Evaluation/Cost Analysis (EE/CA)² (Parsons, 2011a). NYSDEC and EPA encourage the public to review the EE/CA to gain a more comprehensive understanding of the proposed response action.

This document is being provided as a supplement to the EE/CA to inform the public of NYSDEC and EPA's preferred response action and to solicit public comments pertaining to the response actions that were evaluated, including the preferred response action.

NYSDEC and EPA's preferred response action consists of the removal of soils and wetland sediments between the Harbor Brook barrier walls (East and West Walls) and Onondaga Lake; placement of an isolation cap; and restoration of the area as wetlands.

The response action described in this document is the *preferred* response action for the "Outboard Area" of the Wastebed B/Harbor Brook (WBB/HB) Site ("site"). (See description of "Outboard Area" under the section, IRM Description.) Changes to the preferred response action or a change from the preferred response action to another response action may be made if public comments or additional data indicate that such a change will result in a more appropriate response action. NYSDEC and EPA are soliciting public comment on all of the response actions considered in the detailed analysis of the EE/CA because NYSDEC and EPA may select a

¹ The use of the term "Interim Remedial Measure" throughout this document is not intended to mean that this removal action is a "remedial action" as that term is defined in the federal law CERCLA. An IRM is an activity that is necessary to address either emergency or non-emergency site conditions, which in the short-term, needs to be undertaken to prevent, mitigate or remedy environmental damage or the consequences of environmental damage attributable to a site. An IRM is equivalent to a non-time critical removal under the CERCLA removal program pursuant to 40 C.F.R. ' 300. 415(b)(2).

² The EE/CA was developed consistent with EPA's December 1993 *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*. (OSWER Directive 9360.0-32).

response action other than the preferred response action. The final decision regarding the selected response action will be made after NYSDEC and EPA have taken into consideration all public comments and will be documented in a Response Action Document (RAD), the document that will formalize the selection of the response action.

COMMUNITY ROLE IN SELECTION PROCESS

NYSDEC and EPA rely on public input to ensure that the concerns of the community are considered in selecting an effective response action for each Superfund site. To this end, the EE/CA and this document have been made available to the public for a public comment period which begins on January 20, 2012 and concludes on February 20, 2012.

A public availability session and public meeting will be held during the public comment period at the Martha Eddy Room in the Art and Home Center at the New York State Fairgrounds on February 1, 2012 (in case of severe weather, notice will be given to local media outlets that the meeting will be postponed until February 9, 2012 at the same time and location). The public meeting will be held at 7:00 PM and an open house will be held from 6:00 – 7:00 PM to answer questions on the response actions presented in this PRAD, further elaborate on the reasons for recommending the preferred response action, and to receive public comments.

Comments received during the comment period will be considered and incorporated into the responsiveness summary supporting the RAD.

The EE/CA and other site documents, which contain the information upon which the selection of the response action will be based, are available at the following locations:

Onondaga County Public Library

Syracuse Branch at the Galleries
447 South Salina Street
Syracuse, NY 13202-2494
Telephone: (315) 435-1800

Atlantic States Legal Foundation

658 West Onondaga Street
Syracuse, NY 13204-3711
(315) 475-1170
Please call for hours of availability

Solvay Public Library

615 Woods Road
Solvay, NY 13209
Phone: (315) 468-2441

NYSDEC Central Office

625 Broadway
Albany, NY 12233-7013
(518) 402-9676
Hours: M – F 8:30 a.m. – 4:45 p.m.
Please call for an appointment

NYSDEC Region 7 Office

615 Erie Boulevard West
Syracuse, NY 13204-2400
(315) 426-7400
Hours: M – F 8:30 a.m. – 4:45 p.m.
Please call for an appointment

Written comments should be addressed to:

Mr. Tracy A. Smith
Wastebed B/Harbor Brook IRM – Public Comments
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233-7013
e-mail: DERweb@gw.dec.state.ny.us

(Indicate “WBB/HB Outboard Area IRM Comments” in the subject line of the e-mail)

SITE BACKGROUND

Scope and Role of Operable Unit

Since many Superfund sites are complex and have multiple contamination problems and/or areas, they are often divided into several operable units to manage the site-wide response actions. Section 300.5 of the NCP defines an operable unit as “a discrete action that comprises an incremental step toward comprehensively addressing site problems.” This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. Operable units may address geographical portions of a site, specific site problems, or initial phases of an action, or they may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.”

On June 23, 1989, the Onondaga Lake Site was added to the New York State Registry of Inactive Hazardous Waste disposal sites. On December 16, 1994, Onondaga Lake and its tributaries and the upland hazardous waste sites which have contributed or are contributing contamination to the lake (subsites) were added to EPA’s National Priorities List (NPL). NYSDEC and EPA have, to date, organized the work for the Onondaga Lake NPL Site into 11 subsites (See Figure 1). These subsites are also considered by EPA to be operable units of the NPL site. The WBB/HB Site is one of the subsites at the Onondaga Lake NPL Site. The status of the other subsites is discussed below. This PRAD focuses only on the Outboard Area of the WBB/HB Subsite of the Onondaga Lake Superfund site. The Outboard Area IRM for the WBB/HB Subsite is intended to be consistent with, and an integral part of, the final WBB/HB site-wide remedy.

Status of Other Onondaga Lake NPL Subsites

Onondaga Lake Bottom Subsite

In July 2005, NYSDEC and EPA issued a Record of Decision (ROD) for the Onondaga Lake Bottom Subsite of the Onondaga Lake NPL Site. The selected remedy includes dredging an estimated 2.65 million cubic yards (CY) (2.03 million cubic meters [m³]) of contaminated sediments and isolation capping of an estimated 425 acres in the littoral zone (water depths ranging from 0 to 30 ft), thin-layer capping of an estimated 154 acres in the profundal zone (water depths exceeding 30 ft), and monitored natural recovery (MNR) in the profundal zone. It is anticipated that the most highly contaminated materials would be treated and/or disposed of off-Site. The balance of the dredged sediment would be placed in the Sediment Consolidation Area (SCA) at Wastebed 13. In January 2007, Honeywell International Inc. (Honeywell) entered into a consent decree with the State of New York whereby Honeywell committed to implement the remedy at the Onondaga Lake Bottom Subsite. Extensive pre-design investigations commenced in September 2005 and are ongoing, along with remedial design and remedial construction activities (Parsons, 2008). Dredging in the lake is scheduled to begin in 2012.

Other Subsites

In September 2000, NYSDEC issued a ROD for the LCP Bridge Street Subsite. In March 2002, Honeywell entered into an administrative consent order whereby Honeywell committed to implement the remedy. The remediation was substantially completed in 2007 (some additional excavation work is being performed in 2011). Remedial construction included the removal of contaminated sediments from the West Flume, on-site ditches, and wetlands; restoration of wetlands; installation of a low-permeability cutoff wall around the site; installation of an interim low-permeability cap; and capture of contaminated groundwater inside the cutoff wall.

The Ley Creek PCB Dredgings Subsite ROD was issued in 1997 and remedial construction activities were completed in 2001.

The Semet Residue Ponds Subsite ROD was issued in 2002. Construction activities associated with a portion of the groundwater remedy component (lakeshore barrier wall/collection system for the shallow and intermediate zones) were completed in 2007. Construction of the remaining portion (groundwater collection system adjacent to Tributary 5A) is ongoing. Honeywell, NYSDEC and EPA are evaluating a potential modification to the portion of the remedy that addresses the pond residues.

The Town of Salina Landfill Subsite ROD was issued in March 2007. The ROD called for the capping of two individual landfilled areas. During the design, it was determined that one of the landfills does not contain significant hazardous substances. In September 2010, NYSDEC and USEPA executed a ROD amendment for the excavation and consolidation of the two landfilled areas into one landfilled area north of Ley Creek prior to capping. Site mobilization for remedial construction commenced in November 2010; the remedy is scheduled for completion in 2013.

RODs for two portions of the Geddes Brook/Ninemile Creek Subsite were signed in April and October 2009. The selected remedies include the dredging/excavation and removal of an estimated 120,000 CY (92,000 m³) of contaminated channel sediments and floodplain soils/sediments over approximately 30 acres. Depending on the location, clean materials, consisting of a habitat layer and, if needed, backfill, will be placed in the dredged/excavated areas. Contaminated sediments and soils removed from the stream and floodplains will be disposed of at either the LCP Bridge Street Subsite containment system, which was designed and constructed pursuant to the requirements of a September 2000 ROD, or the SCA, which is being constructed at Wastebed 13 as part of the remediation of the Onondaga Lake Bottom subsite in accordance with the 2005 ROD. Excavation of sediment and floodplain soil and restoration of the stream and floodplain/wetland at Geddes Brook under an IRM commenced in May 2011 and is scheduled for completion in July 2012.

A ROD for the Niagara Mohawk – Hiawatha Boulevard – Syracuse Former MGP Subsite was signed on March 31, 2010. The selected remedy calls for contaminated soil in the northeastern portion of the Subsite that could leach contaminants to ground water to be solidified in place and ground water along the northern perimeter of the Subsite to be treated using enhanced bioremediation. The design for the remedy is currently underway and is anticipated to be completed by mid-2012.

In addition to the remedial investigation/feasibility study (RI/FS) ongoing at the Wastebed B/Harbor Brook Subsite, RI/FSs are presently being performed at four other subsites: General Motors: Inland Fisher Guide and Ley Creek Deferred Media, Wastebeds 1-8, Willis Avenue; and Lower Ley Creek. It is anticipated that the RI/FSs for these sites will be completed in the next few years.

Site Location and Setting

The WBB/HB Subsite is located to the north and south of Interstate Route I-690 in the City of Syracuse and Town of Geddes, Onondaga County. It consists of Harbor Brook, Lakeshore Area (including Wastedbed B and the East Flume), Penn-Can Property, Railroad Area, and areas of study (AOS #1 and AOS #2) east of Harbor Brook (See Figure 2). Wetland SYW-12, located north of Onondaga Creek, is being investigated under the WBB/HB Subsite RI/FS.

History of Site Operations

Wastedbed B is a former Solvay wastedbed which received Solvay waste (generated by Allied Chemical Corporation operations) from approximately 1898 to 1926. Wastedbed B covers approximately 28 acres and was engineered to receive waste by construction of a bulkhead into Onondaga Lake. The Penn-Can Property has historically been used for the production and storage of asphalt products. The Barrett Division of the Semet Solvay Company of Allied Chemical Corporation (predecessor to Honeywell) operated at the property from 1919 to approximately 1978. Barrett produced various asphalt emulsions and some coal tar-based products used in road construction. The Railroad Area is situated to the south of the Penn-Can Property and is bounded to the north, south and east by railroad tracks.

Summary of Site Investigations

Investigations at the WBB/HB Subsite indicate that four primary source areas are present. The areas are the Penn-Can Property, Dredge Spoil Area (DSA) #1, DSA#2, and stained material at AOS #1/Lakeshore Area wetlands. The contaminants of concern in site media include benzene, toluene, ethylbenzene, xylene (BTEX), chlorinated benzenes, naphthalene and other polycyclic aromatic hydrocarbons (PAHs), phenolic compounds, polychlorinated biphenyls (PCBs), and polychlorinated dibenzo-dioxins/polychlorinated dibenzo-furans (PCDD/PCDFs).

An apparent source of coal tar residues, including non-aqueous phase liquids (NAPL), was identified in the eastern central portion of the Penn-Can Property. The coal tar residues are associated with the historic operations of the former paving facilities that were located on the central and eastern portions of the Penn-Can Property. These residues are likely present due to releases from the former Barrett Paving facility previously located on the property. Residues from this source area migrated into the subsurface and then down slope through coarse lenses of marl and along the top of low-permeability (confining) geologic units (*i.e.*, silt/clay and till) to depths of at least 20 feet (ft) (6.1 meters [m]) below ground surface (bgs) in the area of lower Harbor Brook. As shown on Figure 3, these residues, including NAPL, appear to have migrated to the vicinity of Wastedbed B and Harbor Brook. Ground water has also been impacted in areas associated with the NAPL. Soils, sediments and surface water have been impacted in areas where shallow and intermediate ground water discharge to surface water bodies (Harbor Brook, I-690 drainage ditch, and other site related ditches). The primary constituents associated with the NAPL include BTEX, and naphthalene and other PAHs.

IRM Description

The Outboard Area is a 16-acre strip of land that lies between the barrier walls that are being installed as part of the WBB/HB East and West Wall IRMs (see below) and Onondaga Lake (including the mouth of Harbor Brook and areas of wetlands along the shoreline). The proposed Outboard Area IRM would include the removal of soil and wetland sediments from the area between the barrier wall and Onondaga Lake (See Figures 4A and 4B), placement of a chemical isolation cap, and restoration as wetlands. The Outboard Area IRM is the subject of this PRAD.

Other Wastebed B/Harbor Brook Site Areas/Media

In 2003, Honeywell and NYSDEC entered into an Order on Consent (Index #D7-0008-01-09) to conduct an IRM for WBB/HB. The IRM scope includes a vertical barrier to be installed along the Onondaga Lake shoreline perimeter of Wastebed B and upstream along the west bank of Harbor Brook with a ground water collection system installed along the vertical barrier. The location of the barrier wall to the west of Harbor Brook (“West Wall”) is identified in the final design approved by NYSDEC on December 3, 2009 (See Figure 4A), and the location of the barrier wall to the east of Harbor Brook (“East Wall”), as required by the May 2011 RAD, is identified in the final design approved by NYSDEC on July 29, 2011.

The East Flume is being addressed under an IRM pursuant to an April 2002 Consent Order with NYSDEC. This included slip-lining a 72-inch pipe which conveyed storm water to the East Flume. The pipe was also extended to discharge the storm water directly to Onondaga Lake. The slip-lining was done to prevent contaminated groundwater from entering into the pipe and discharging into Onondaga Lake. A 42-inch sewer will be abandoned and replaced. The design for the replacement of the 42-inch pipe is ongoing, and this construction is scheduled to take place in 2012. A 60-inch pipe, which also discharged to the East Flume, was abandoned. The pipe is being used as a carrier for four smaller pipes placed within it. The annular space within the 60-inch pipe was filled with flowable grout to prevent ground water from migrating within it. The four smaller pipes may be used, in part, for water conveyance from the Lakeshore Area to the Willis Avenue Ground Water Treatment Plant. Other site areas and media will be addressed under the WBB/HB Subsite RI/FS.

SUMMARY OF SITE RISKS

A Streamlined Risk Evaluation (SRE) was prepared for the Outboard Area of the WBB/HB Subsite. The objective of the SRE was to provide a concise evaluation of potential risks to human and ecological receptors, assuming no removal or clean-up actions would be taken at the Outboard Area. The SRE relates to exposure to the contaminated media being addressed by this IRM and the contribution that these media may have made to unacceptable risks in the Outboard Area. A summary of the human health and ecological evaluations are provided below.

Human Health Evaluation

The intended future use of a portion of the Outboard Area is for habitat enhancements, including wetland improvements. In addition, the area will also likely be used for recreational activities (e.g., biking, running, walking along a trail). Current and future exposure scenarios in the area which were considered in the SRE include trespassers, construction workers, surveillance workers, and recreational visitors. Although unlikely, potential future industrial/commercial workers and residents were also considered in the SRE.

A conservative screening process was applied to identify constituents of potential concern (COPCs) in the surface soil, subsurface soil, and sediment that may pose potential risk to current and future receptors. Some of these COPCs were also previously identified as risk drivers in the Lake based on consumption of fish. Specifically, the SRE identified arsenic, dioxins/furans (2,3,7,8-TCDD equivalents), mercury, and PCBs as being among the COPCs for surface soil and Harbor Brook sediment, with dioxins/furans exceeding its screening criterion by approximately two or more orders of magnitude. Arsenic, mercury, and PCBs were also identified as COPCs for subsurface soil, with arsenic exceeding its respective screening criterion by more than two orders of magnitude. PCBs were also identified as COPCs for subsurface soil. In the baseline Human Health Risk Assessment (HHRA) for the Lake Bottom Subsite, it was determined that arsenic, dioxins, mercury, and PCBs were the primary risk drivers associated with the consumption of fish from the Lake (TAMS, 2002a). EPA’s acceptable risk thresholds were exceeded for both potential

cancer and noncancer risks (*i.e.*, potential cancer risks exceed the 10^{-4} to 10^{-6} risk range and potential noncancer risks exceeded a hazard index [HI] of 1).

Ecological Evaluation

Constituents of potential ecological concern (COPECs) for surface soil, and Harbor Brook sediment were identified by screening the maximum detected concentrations in Outboard Area media against recommended conservative ecologically-based screening criteria and/or guidance values.

In surface soil, antimony, arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, zinc, cyanide, dichlorobenzenes, trichlorobenzenes, xylenes, PAHs, DDT and metabolites, dieldrin, and PCBs exceeded screening criteria, with chromium, iron, lead, mercury, and 4,4'-DDT exceeding their respective criteria by approximately two or more orders of magnitude. These metals and compounds also were identified as surface soil contaminants of concern (COCs) in the Onondaga Lake Baseline Ecological Risk Assessment (BERA; NYSDEC 2002b). In addition, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc were among the risk drivers associated with the potential for phytotoxic effects in soil.

Sediment COPECs included metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), benzene, ethylbenzene, toluene, xylenes, chlorobenzenes, PAHs, hexachlorobenzene, phenol, dieldrin, and heptachlor/heptachlor epoxide. These COPECs were also identified as sediment COCs in the Onondaga Lake BERA. Mercury, 2-methylnaphthalene, fluorene, naphthalene, phenol, and chlorobenzene exceeded their respective screening criteria by approximately 2 or more orders of magnitude. In addition, PCBs and dioxins/furans (2,3,7,8-TCDD equivalents) were detected in the Outboard Area sediment and have been identified as sediment COCs in the Onondaga Lake BERA (TAMS, 2002b).

Key results of the Onondaga Lake BERA indicate that comparisons of measured tissue concentrations and modeled doses of chemicals to toxicity reference values show exceedances of hazard quotients for site-related chemicals throughout the range of the point estimates of risk. Site-specific sediment toxicity data indicate that sediments are toxic to benthic macroinvertebrates on both an acute (short-term) and chronic (long-term) basis. Many of the contaminants in the Lake are persistent and, therefore, the risks associated with these contaminants are unlikely to decrease significantly in the absence of remediation. On the basis of these comparisons, it has been determined through the Onondaga Lake BERA that all receptors of concern are at risk. Contaminants and stressors in the Lake have either impacted or potentially impacted every trophic level examined in the Onondaga Lake BERA (NYSDEC and EPA, 2005).

Conclusions

The identification of constituents of potential concern to human health (*i.e.*, COPCs) and potential ecological concern (*i.e.*, COPECs) indicate that there is a potential threat to human health and the environment. Many of these COPCs and COPECs are also identified as COCs in the Onondaga Lake HHRA and BERA. Therefore, the SRE results indicate that there is a clear potential threat to human health from exposure to some constituents found in surface soil, subsurface soil, and sediment. Likewise, there is a potential threat posed to ecological receptors from exposure to surface soil and sediment. Response actions in the Outboard Area being evaluated by the EE/CA are warranted based on the following factors acknowledged in 40 CFR Section 300.415 (b)(2):

- Potential threat of exposure to nearby human populations, animals, and the food chain from COPCs and COPECs;
- Unacceptable potential risks due to elevated levels of COPCs and COPECs in soils and sediment;
- Potential threat to public health, welfare, or the environment;

- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate; and
- Actual or potential contamination of sensitive ecosystems.

The proposed IRM for the Outboard Area calls for remediation and restoration of impacted soil and sediments and is intended to eliminate, to the extent practicable, continued migration of COCs into Onondaga Lake and Harbor Brook. In addition, the potential ecological and human health risks associated with exposure to surface water will be addressed by the elimination of contamination sources from soil (from runoff) and sediment, which can impact water quality. Consequently, the proposed remediation and restoration activities will eliminate, to the extent practicable, potential human health and ecological impacts associated with Site-related constituents of concern.

RESPONSE ACTION OBJECTIVES

The WBB/HB Outboard Area IRM objectives are to:

- Eliminate, to the extent practicable, releases of contaminants from the Outboard Area;
- Eliminate, to the extent practicable, potential impacts to human health and to the environment (e.g., to fish and wildlife resources)

IDENTIFICATION, SCREENING, AND EVALUATION OF REMEDIAL TECHNOLOGIES AND PROCESS OPTIONS

Potentially applicable remedial technology types and process options for each general response action were identified and screened in the EE/CA. Technologies and process options were screened on the basis of technical implementability. Technical implementability for each identified process option was evaluated with respect to contaminant information, physical characteristics, and areas and volumes of affected media.

The remedial technologies and process options remaining after the initial screening were evaluated further in the EE/CA according to the criteria of effectiveness, implementability, and cost.

SUMMARY OF RESPONSE ACTIONS

Four potential response actions to address the Outboard Area IRM were developed, as described below.

Common Components

Each response action, with the exception of the No Action Response Action, includes the following common components:

- Removal of surface materials;
- Soil/sediment management;
- Placement of an isolation cap;
- Habitat restoration;
- Implementation of institutional controls; and

- Implementation of a long-term maintenance and monitoring (M&M) program³.

With the exception of Response Action 1 (No Action), the response actions evaluated involve different scenarios for the removal of Outboard Area materials over the entire footprint of the Outboard Area prior to cap placement. While the removal depths may vary for each response action, the remaining components would be the same. These methods are proven environmental cleanup methods that would address contamination in the Outboard Area. The cap would include a suitable habitat layer for plants, animals, and fish to use without impacting the chemical isolation layer. The cap would also provide long-term chemical and physical isolation of underlying material from the lake and would resist erosive forces such as wind/wave-generated currents, tributary and other inflows, and ice.

A description of the soil/sediment management, cap, habitat restoration, institutional controls, and M&M program for Response Actions 2, 3, and 4 is provided below.

Soil/Sediment Management

A portion of the dry soil/sediment (materials located above the average lake level) removed from the Outboard Area would be placed on the WBB/HB site inboard of the IRM barrier wall and groundwater collection system. The remaining soil/sediment removed from the Outboard Area would be hydraulically dredged and transported via pipeline and consolidated at the SCA at Wastedbed 13 as part of the Onondaga Lake Bottom Subsite remedy. This would take advantage of the infrastructure that is being constructed to support the implementation of the Lake remedy. These materials would be compatible with the materials that will be dredged from Onondaga Lake and the related additional volume would be within the design capacity of the SCA. The SCA would be designed, constructed, operated, and maintained in accordance with the substantive requirements of NYSDEC Part 360, Section 2.14(a) (industrial monofills) and would include an impermeable liner, leachate collection system, and cover. Trucks would not be used for transporting Outboard Area soils/sediment to the SCA.

For the purpose of cost estimating, the total estimated volume of dry materials to be removed and placed on WBB for Response Actions 2, 3 and 4 is 35,000 CY (27,000 m³). The exact volume of dry material would be determined as part of the IRM design. The dry material would be mechanically excavated, relocated to an area inboard of the barrier wall and groundwater collection trench at the WBB/HB Subsite, and covered. The remaining materials to be removed from the Outboard Area (between approximately 155,000 CY (119,000 m³) and 245,000 CY (187,000 m³), depending on the response action) would be hydraulically dredged and transported via pipeline to the SCA in conjunction with the adjacent lake dredging using the same equipment and transport system that would be constructed to support the lake dredging activities.

Approximately 35,000 CY (27,000 m³) of material was recently relocated at the WBB/HB Subsite as part of the site regrading work required for the WBB/HB West Wall installation. The final disposition of these materials, as well as Outboard Area soils relocated upgradient of the wall, would be evaluated during the FS and ROD for the site.

An evaluation of other soil/sediment management options for the IRM is included in the EE/CA.

As part of the designs for the East and West barrier walls, comprehensive geotechnical analyses were conducted to determine if and what kind of impacts future excavation activities within the Outboard Area might have on the stability of the walls and nearby structures (e.g., railroads, sewer lines). Based on the results of the geotechnical analyses, limitations on the size and depth of Outboard Area excavations have been established to maintain the stability of the walls and the nearby structures. Outboard Area excavation limitations are presented in the EE/CA and have been considered during the development of the potential response actions evaluated below.

³ The term M&M is used here and elsewhere in lieu of Operation and Maintenance (O&M) which is cited in the NCP since the response actions do not include facilities which will need operation.

Isolation Cap

Based on the remedial action objectives established for the Outboard Area, the functions of the cap include the following:

- Physical isolation of the contaminated sediment/soil from the environment;
- Reduction or elimination of the flux of dissolved contamination into the upper layers of the cap;
- Stabilization of contaminated sediment/soil, preventing resuspension and transport of contaminants to the lake; and
- Restoration and enhancement of habitat in the onshore areas of Onondaga Lake.

To ensure that habitat restoration and chemical isolation goals are met and that the cap provides long-term protection of human health and the environment, the cap would include specific layers dedicated to various purposes. These layers would include a habitat layer, an erosion protection layer (where necessary), a chemical isolation layer, and an allowance for mixing of the bottom of the chemical isolation layer with the underlying sediment.

During the design of the IRM that is ultimately selected, removal depths and cap thicknesses will consider the base removal and hot-spot removal depths/elevations and cap thicknesses in the near-shore areas of the in-lake waste deposit (ILWD) to ensure slope stability during dredging and placement of a multi-layered cap. The final lake dredge design will address the transition between the Outboard Area and Onondaga Lake.

Cap Performance Criteria: To evaluate sediment quality in Onondaga Lake, toxicity of the sediment to sediment-dwelling (benthic) invertebrates was tested. Laboratory tests involved exposing the midge *Chironomus tentans* and the amphipod *Hyaella azteca* to Onondaga Lake sediments and observing their growth and survival. Since the results for *Chironomus tentans* were found to be the more sensitive test, these acute toxicity data were then used to develop the five site-specific sediment effects concentrations and probable effects concentrations (PECs) for each COC.⁴ The performance criteria for the cap would be the PEC for each of the contaminants that have been shown to exhibit acute toxicity on a lake-wide basis, as well as the NYSDEC sediment screening criteria for benzene, toluene, and phenol.

Using data obtained from the lake cap design, the anticipated cap thickness in the western Outboard Area would be approximately 4.5 ft (1.4 m). Due to lower pH levels, the anticipated cap thickness in the eastern Outboard Area would be approximately 4 ft (1.2 m). It is anticipated that the western outboard area would require a pH amendment to the isolation cap similar to the adjacent ILWD due to the elevated pH levels. A pH amendment is not anticipated for the eastern portion accounting for the difference in cap thickness between the two areas. These thicknesses are based on a minimum 12-inch (30 centimeter [cm]) chemical isolation layer, a 24-inch (60 cm) habitat layer, and include average over placement that may result to ensure a minimum thickness of each layer is achievable. The actual cap thickness would likely vary based on further detailed analysis and testing conducted during the design.

Restoration

Preliminary habitat restoration plans for this area were developed in the Draft Habitat Plan (Parsons, 2009) which presents the conceptual habitat restoration designs for Onondaga Lake in those portions of the lake and adjacent areas where remediation activities would be conducted. Habitat restoration plans for this area were further developed in the draft Onondaga Lake

⁴ More details on the development of sediment effects concentrations and probable effects concentrations can be found in the Onondaga Lake Bottom subsite ROD issued in July 2005.

Capping, Dredging, and Habitat Intermediate Design (Parsons, 2011b). An overview of the restoration for the Outboard Area is shown on Figure 5. The goals that would be used to determine clean soil acceptable for use as suitable habitat layer material would be based on NYSDEC's unrestricted use Soil Cleanup Objectives (6 NYCRR 375-6.8[a]).

Operation, Maintenance and Monitoring

Post-construction M&M of the capped areas would be performed to verify that the overall integrity of the cap is maintained so that it remains physically stable (*i.e.*, would not erode) and chemically protective over time. Long-term monitoring of the cap would include physical monitoring to verify stability and sampling of the cap to verify its chemical integrity. In the unlikely event that the monitoring identifies areas where the cap is not performing consistent with expectations, contingency response actions would be taken to maintain and repair the cap as necessary.

Institutional controls would be needed to ensure long-term effectiveness of the remedy. Institutional controls would include notification of appropriate government agencies with authority for permitting potential future activities which could impact the implementation and effectiveness of the remedy. The duration of these institutional controls would be dependent on lake/wetland conditions and the specifics of the institutional control.

Response Action 1: No Action

Capital Cost	\$0
Annual M&M Cost	\$0
Present-Worth M&M Cost	\$0
Total Present-Worth Cost	\$0
Construction Time	0 years

The "No Action" response action would not include the implementation of any physical measures or monitoring. This response action is used as the baseline against which the other response actions are evaluated.

Response Action 2: Removal for Cap Placement and Habitat Restoration

Capital Cost	\$22,840,000
Annual M&M Cost	\$21,100
Present-Worth M&M Cost	\$160,600
Total Present-Worth Cost	\$23,000,000
Construction Time	0.5 years

Under this response action, surface materials within the Outboard Area would be removed for placement of an isolation cap and achieving final grades lower than the existing grade elevations to facilitate habitat restoration. Habitat restoration (required under this IRM) in the Outboard Area was designed to take better advantage of the seasonal inundation of emergent wetland areas along the shoreline and create habitat that is more suitable for northern pike reproduction.

To provide suitable conditions over a wide range of lake levels, the wetlands would be designed with a gradual slope from the areas adjacent to the barrier wall out to the Onondaga Lake shoreline. This type of self-designing system would respond to natural changes in water level and patterns of sediment movement. Water levels during the potential northern pike spawning season were evaluated using Onondaga Lake level data from the United States Geological Survey Gauging Station at Liverpool, New York.

Based on the anticipated cap thicknesses and target final grades for the western and eastern Outboard Areas, excavation would be conducted to depths ranging from 1.5 to 3 m (4.9 to 9.8 ft) (an average depth of 2 m [6.6 ft]) in order to facilitate placement of the cap and achieve final target grades.

Figures 6 and 7 illustrate a conceptual cross-section and the anticipated removal depths throughout the Outboard Area under this response action. It is estimated that approximately 190,000 CY (145,000 m³) of material would be removed under this response action. Approximately 35,000 CY (27,000 m³) of dry material would be excavated and relocated to an area inboard of the barrier wall and groundwater collection system at the WBB/HB Subsite and the remaining 155,000 CY (120,000 m³) would be dredged and pumped to the SCA. The anticipated duration of the excavation/dredging, transport of materials and capping is 137 work days⁵.

Response Action 3: Removal for Cap Placement, Hot Spot Excavation, and Habitat Restoration

Capital Cost	\$23,840,000
Annual M&M Cost	\$21,100
Present-Worth M&M Cost	\$160,600
Total Present-Worth Cost	\$24,000,000
Construction Time	0.5 years

This response action involves the same components as Response Action 2, including an isolation cap and removal of surface materials to achieve a final post-cap grade for habitat restoration. Response Action 3 would also involve additional removal of material in areas where higher concentrations of CPOIs have been detected. These areas are referred to as “hot spots” and are defined as those sediments and or wastes that contain contaminants above the threshold criteria specified in the Onondaga Lake ROD (NYSDEC and EPA, 2005), as listed below.

CPOI	Sediment Hot Spot Criteria (mg/kg)
Benzene	208
Chlorobenzene	114
Dichlorobenzenes	90
Naphthalene	20,573
Xylenes	142
Ethylbenzene	1,655
Toluene	2,625
Mercury	2,924

⁵ The actual schedule of work would be dependent on how dredging and capping for this area is incorporated into the schedule for Onondaga Lake.

Only three CPOIs were detected within the Outboard Area at concentrations which exceeded the Lake hot spot criteria. These include chlorobenzene, dichlorobenzene and xylene.

Two hot spot areas (East Flume Hot Spots and DSA Hot Spots) were identified where sediment concentrations have been detected which exceed the lake sediment screening criteria (for dichlorobenzene and xylene) within the 1-m interval below the base excavation required for cap placement and habitat restoration, but above the maximum excavation limits established for stability.

Hot spot delineations were determined based on data indicating that adjacent samples within the same depth interval did not exceed the lake sediment screening criteria. The delineation methods used for the Outboard Area were consistent with those used to delineate hot spot removal areas within Remediation Area D of the Lake, as described in Appendix G of the Lake Sediment Capping, Dredging, and Habitat Intermediate Design Report (Parsons, 2011b).

Under this response action, hot spot excavation/dredging would include removal of an additional 1 m (3.3 ft.) if the hot spot exceedance falls within this additional depth range, consistent with the hot spot approach for the lake. Excavation/dredging for hot spot removal would not extend beyond the maximum excavation limits that are established for stability of existing or proposed features, including the railroad and barrier walls (see Appendix A of the EE/CA). The cap would be designed to isolate remaining sediments and soils that exceed the hot-spot criteria. The restoration design would consider deeper pools for nursery habitat that coincide with the hot spot removal areas as a means of creating variable topography. If appropriate, additional fill materials would be placed within the Outboard Area to achieve the final post-cap target grades.

Figures 8 and 9 illustrate a conceptual cross-section and the anticipated removal depths throughout the Outboard Area under Response Action 3. It is estimated that approximately 199,000 CY (152,000 m³) of material would be removed under Response Action 3. Approximately 35,000 CY (27,000 m³) of dry material would be excavated and relocated to an area inboard of the barrier wall and groundwater collection system at the WBB/HB Subsite and the remaining 164,000 CY (125,000 m³) would be managed at the SCA. The anticipated duration of the excavation/dredging, transport of materials and capping is 140 work days⁶.

Response Action 4: Removal to Maximum Excavation Limits, Cap Placement, and Habitat Restoration

Capital Cost	\$33,840,000
Annual M&M Cost	\$21,100
Present-Worth M&M Cost	\$160,600
Total Present-Worth Cost	\$34,000,000
Construction Time	1 year

This response action involves the removal of Outboard Area materials to the maximum excavation limits established to maintain site stability. The excavation limitations established for wall and railroad stability during Outboard Area excavation preclude the removal of all contaminated materials. Therefore, this response action represents the maximum removal response action for evaluation.

⁶ The actual schedule of work would be dependent on how dredging and capping for this area is incorporated into the schedule for Onondaga Lake.

Under this response action, excavation/dredging would be extended to the maximum excavation depths based on stability considerations, which range from approximately 1 to 4 m. Additional fill materials would be placed within the Outboard Area, as necessary, to achieve the final post-cap target grades.

Figures 10 and 11 illustrate a conceptual cross-section and the anticipated removal depths throughout the Outboard Area under Response Action 4. It is estimated that approximately 280,000 CY (215,000 m³) of material would be removed under Response Action 4. Approximately 35,000 CY (27,000 m³) of dry material would be excavated and relocated to an area inboard of the barrier wall and groundwater collection system at the WBB/HB Subsite and the remaining 245,000 CY (188,000 m³) would be managed at the SCA. The anticipated duration of the excavation/dredging, material transport and capping is 204 work days⁷.

EVALUATION OF RESPONSE ACTIONS

To select a response action for a site, a detailed analysis of the viable response actions was conducted. The detailed analysis consists of an assessment of the individual response actions against each of three evaluation criteria (effectiveness, implementability, and cost) and a comparative analysis focusing upon the relative performance of each response action against those criteria.

Effectiveness

This criterion refers to a response action's ability to meet the removal action objectives. The overall assessment of effectiveness is based on a composite of factors, including overall protection of public health and the environment, compliance with Applicable or Relevant and Appropriate Requirements (ARARs), long-term effectiveness and permanence, reduction of toxicity, mobility, and volume through treatment, and short-term effectiveness, as follows:

- Overall protection of human health and the environment assesses whether the response actions are protective of public health and the environment. The evaluation will focus on how each response action achieves adequate protection and describe how the response action will reduce, control, or eliminate risks at the site through the use of treatment, engineering, or institutional controls.
- Compliance with ARARs addresses whether or not a response action would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes.
- Long-Term Effectiveness and Permanence involves the evaluation of the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes at the site. This criterion also considers the adequacy and reliability of controls and addresses the need for post-removal site control.
- Reduction of Toxicity, Mobility, and Volume through Treatment includes evaluating the anticipated performance of specific treatment technologies. This evaluation addresses the statutory preference for selecting response actions that employ treatment technologies to permanently and significantly reduce toxicity, mobility, or volume of wastes. Factors that will be considered, as appropriate, include: the treatment or recycling processes the response actions employ and the materials they would treat; the amount of hazardous materials to be destroyed or treated; the degree of reduction expected in toxicity, mobility, or volume; the degree to which the treatment would be

⁷ The actual schedule of work would be dependent on how dredging and capping for this area is incorporated into the schedule for Onondaga Lake.

irreversible; the type and quantity of residuals that would remain after treatment; and whether the response action would satisfy the preference for treatment.

- Short-Term Effectiveness examines the effectiveness of response actions in protecting public health and the environment during the construction and implementation period until the removal action objectives have been met. The following factors will be considered: potential for short-term risks to the affected community as a result of the response action; potential impacts on workers during the response action, and the effectiveness and reliability of protective measures that would be taken; potential adverse environmental impacts of the response action, and the effectiveness and reliability of protective measures that would be taken; and time until protection is achieved.

Implementability

Under this criterion, the ease of implementing the response actions will be assessed by considering the following factors: technical feasibility, including technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional response actions, the ability to monitor the effectiveness of the response action, and the extent to which the removal action contributes to the efficient performance of any long-term remedial action; administrative feasibility, including activities needed to coordinate with other offices and agencies, the ability to obtain necessary approvals and permits from other agencies (for off-site actions), and statutory limits on removal actions; availability of services and materials, including the availability of adequate on or off-site treatment, storage capacity, and disposal capacity and services; and the availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources; and the availability of prospective technologies for full-scale application. This criterion will also assess support agency and community acceptance, as described below.

- Support Agency Acceptance indicates whether, based on its review of the EE/CA and this document, the New York State Department of Health (NYSDOH) agrees with, opposes, or has no comment on the preferred response action at the present time.
- Community Acceptance, which will be assessed in the Response Action Document, refers to the public's general response to the response actions described in the EE/CA and this document.

Cost

The costs include the capital costs, including both indirect and direct costs; post-removal site control costs, which include annual maintenance and residual disposal costs; and present-worth costs, which include the capital costs plus the present value of 30 years of post-removal site control costs (calculated at a 7 percent discount rate).

Comparative Analysis of Response Actions

A comparative analysis of the response actions based upon the evaluation criteria noted above is provided below.

Effectiveness

The effectiveness of each of the response actions, other than no action, would rely on the ability of the cap, in conjunction with institutional controls and a long-term M&M program, to provide long-term chemical isolation of underlying impacted soil/sediments. With the exception of the No Action Response Action, all of the evaluated Response Actions include restoration consistent with the Habitat Plan and/or subsequent design changes regarding pike spawning habitat for the Outboard Area. Cap design would be based on meeting long-term effectiveness objectives for

protection of human health and the environment; cap design effectiveness would be such that Response Actions 2, 3, and 4 would provide the same degree of protectiveness. Because the cap, institutional controls, and M&M components are the same, the long-term effectiveness associated with Response Actions 2, 3 and 4 is anticipated to be the same.

Data suggests that Response Action 2 removes the majority of materials present within the Outboard Area that exceed the lake sediment hot spot criteria. Response Action 3 removes approximately 9,000 additional CY (7,000 m³) of material exceeding the lake hot spot criteria reducing the toxicity and mobility of the contaminated sediments/soils; and reliance on the cap to provide protection. Although Response Action 4 removes the largest volume of material, the additional 81,000 CY (63,000 m³) under Response Action 4 results in the removal of minimal additional amounts that exceeds hot spot criteria and would not increase the protectiveness of the response action.

ARARs and To-Be-Considered criteria (TBCs) are anticipated to be achieved under Response Actions 2, 3 and 4. These ARARs/TBCs include, but are not limited to:

- 6 NYCRR 701 - Classifications - Surface Waters and Ground Waters
- 6 NYCRR Part 703 - Class GA Groundwater Quality Standards
- NYSDEC, Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 (October 1998) - Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations
- 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives
- NYSDEC Technical Guidance for Screening Contaminated Sediment (1999)
- 6 NYCRR 663 - Freshwater Wetland Permit Requirements
- New York State Freshwater Wetlands Implementation Program, 6 NYCRR 662 and 665
- New York State Freshwater Wetlands Law, Environmental Conservation Law, Article 24, 71 in Title 23
- Clean Water Act Section 404, 33 Code of Federal Regulations (CFR) Parts 320 - 330
- Clean Water Act Section 404, 40 CFR Parts 230 – 231
- Executive Order 11990 - Protection of Wetlands
- Executive Order 11988 - Floodplain Management
- Policy on Flood Plains and Wetland Assessments for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Actions (OSWER Directive 9280.0-02)
- National Historic Preservation Act, 36 CFR 800 - Preservation of Historic Properties Owned by a Federal Agency
- National Historic Preservation Act, 36 CFR Part 65 - National Historic Landmarks Program
- New York State Historic Preservation Act of 1980, 9 NYCRR Parts 426 - 428
- 33 U.S.C. 1341 - Clean Water Act Section 401, State Water Quality Certification Program
- 6 NYCRR 608 - Use and Protection Of Waters
- 16 USC 661 - Fish and Wildlife Coordination Act
- 33 CFR Parts 330 - Nationwide Permit Program
- 40 CFR Part 257 - Criteria for Classification of Solid Waste Disposal Facilities and Practices
- 6 NYCRR 360 - Solid Waste Management Facilities
- 29 CFR Part 1910.120 - Occupational Safety and Health Standards - Hazardous Waste Operations and Emergency Response
- 29 CFR Part 1926 - Safety and Health Regulations for Construction
- Onondaga Lake Baseline Ecological Risk Assessment ((site specific Sediment Effect Concentrations (SECs) and PECs) (TAMS, 2002b)
- Lake Bottom Subsite ROD (NYSDEC and EPA, 2005) (mean Probable Effect Concentrations Quotient (PECQ) and the Hot Spot threshold concentrations)

Wetlands impacted by these response actions would be restored and any wetlands lost would be mitigated. Response Action 2, 3, and 4, in concert with other remedies, would contribute to meeting surface water ARARs for Onondaga Lake and Harbor Brook.

The potential short-term impacts associated with Response Actions 2, 3 and 4 are similar. Although none of the response actions represents unacceptable short-term risk, the potential for incidents to occur would be dependent on the volume of materials handled which would impact the duration of the construction activities. Potential short-term risks to the community during construction would be associated with dust and vapors. For these response actions, air monitoring would be conducted in accordance with a health and safety plan and community air monitoring plan prepared in accordance with NYSDEC and NYSDOH requirements to ensure the work is protective of on-site workers and the public. Based on the estimated volumes presented in the EE/CA, Response Action 2 represents the least potential short-term risk and Response Action 4 represents the greatest risk of potential short-term impacts. Short-term risks would be minimized through the use of public access restrictions and wetting of the soils, if necessary, to prevent fugitive dust. The risk to workers during construction would include inhalation of dust and vapors and potential direct contact. The risks to workers during construction would be mitigated through use of proper personal protective equipment. The risks to the public and on-Site workers would be mitigated during construction through the implementation of control measures, monitoring, the planning and use of proper procedures, and implementation of a comprehensive site-specific Health and Safety Plan. Adverse environmental impacts would be minimized through appropriate methods such as stormwater management and dust control.

Implementability

Response Actions 2, 3, and 4 involve the mechanical and hydraulic excavation of soil and sediment and the mechanical placement of cap materials. Each of these response actions is technically and administratively feasible and the personnel, equipment, and materials necessary to implement each of these response actions are available.

The degree of difficulty for Response Actions 2, 3 and 4 are dependent on the volume and depth of Outboard Area material to be removed. Based on the removal scenarios presented in the EE/CA, Response Action 2 represents the least difficult response action to implement and Response Action 4 represents the most difficult response action to implement due to the need to remove more material at greater depths, as well as to backfill to meet targeted finish grades. However, all of the response actions are implementable.

NYSDOH provided input on the EE/CA during its preparation and agrees with the preferred response action.

Community acceptance of the preferred response action will be assessed in a decision document following review of the public comments received on the EE/CA and this document.

Cost

The estimated capital, annual M&M costs, and present-worth costs for each of the response actions are presented below.

Response Action	Capital Cost	Annual M&M Cost	Present-Worth M&M Cost	Total Present-Worth M&M Cost
1	\$0	\$0	\$0	\$0
2	\$22,840,000	\$21,100	\$160,600	\$23,000,000
3	\$23,840,000	\$21,100	\$160,600	\$24,000,000
4	\$33,840,000	\$21,100	\$160,600	\$34,000,000

As can be seen by the cost estimates, Response Action 1 is the least costly response action with a present-worth cost of \$0. Response Action 4 is the most costly response action at an estimated present-worth cost of \$34,000,000. Response Action 2 has an estimated present-worth cost of \$23,000,000 and Response Action 3 has an estimated present-worth cost of \$24,000,000.

PREFERRED RESPONSE ACTION

NYSDEC and EPA's preferred response action, Response Action 3, includes removal for placement of an isolation cap and achieving final grades lower than the existing grade elevations to facilitate habitat restoration. Based on the anticipated cap thicknesses and target final grades for the western and eastern Outboard Areas, the majority of the excavation would be conducted to depths ranging from 1.5 to 3 m (4.9 to 9.8 ft) with additional hot spot excavation/dredging to remove an additional 1 m (3.3 ft) (to a maximum depth of 4 m [13.1 ft]) of Outboard Area materials where higher concentrations of CPOIs have been detected. The cap would be designed to isolate remaining sediments and soils that exceed the hot-spot criteria. Habitat restoration in the Outboard Area would create emergent wetland areas and habitat that is more suitable for northern pike reproduction. The restoration design would consider deeper pools for nursery habitat that coincide with the hot spot removal areas as a means of creating variable topography. If appropriate, additional fill materials would be placed within the Outboard Area to achieve the final post-cap target grades.

It is estimated that approximately 199,000 CY (152,000 m³) of material would be removed under Response Action 3. Approximately 35,000 CY (27,000 m³) of dry material would be excavated and relocated to an area inboard of the barrier wall and groundwater collection system at the WBB/HB Subsite and the remaining 164,000 CY (125,000 m³) would be managed at the SCA.

The Outboard Area IRM would be coordinated with other remedial activities at the WBB/HB Subsite and the Onondaga Lake remediation. The actual schedule of work would be dependent on how dredging and capping for this area is integrated into the schedule for Onondaga Lake.

The environmental benefits of the preferred response action may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green policy⁸ and NYSDEC's Division of Environmental Remediation Program Policy *Green Remediation* (DER-31)⁹. This will include consideration of green remediation technologies and practices.

⁸ See http://epa.gov/region2/superfund/green_remediation

⁹ See http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

Basis for the Preferred Response Action

Response Action 3 is the preferred response action to address contaminated material within the Outboard Area for the following reasons:

- Response Action 3 provides the same level of protectiveness as Response Actions 2 and 4.
- In comparison to Response Action 2, Response Action 3 involves removing 9,000 additional cubic yards of material from the Outboard Area which exceeds the lake sediment hot spot criteria, thereby reducing the toxicity and mobility of the contaminated sediments/soils and reliance on the cap to provide protection.
- Response Action 4 would not provide additional protection of human health or the environment. Response Action 4 might present a greater risk of potential short-term impacts due to a greater duration of construction activities and it costs \$10 million (42 percent) more than Response Action 3.

NYSDEC and EPA believe that the preferred response action would provide the best balance among the response actions with respect to the evaluating criteria. NYSDEC and EPA also believe that the preferred response action would be protective of human health and the environment, would comply with ARARs, and would utilize permanent solutions and response action treatment technologies or resource recovery technologies to the maximum extent practicable.

References:

New York State Department of Conservation and United States Environmental Protection Agency. 2005. Record of Decision. *Onondaga Lake Bottom Subsite of the Onondaga Lake Superfund Site*. New York State Department of Environmental Conservation, Albany, New York and United States Environmental Protection Agency, New York, New York. July 2005.

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TAMS. 2002b. *Onondaga Lake Baseline Ecological Risk Assessment*. TAMS, New York, New York and YEC, Valley Cottage, New York. December 2002.

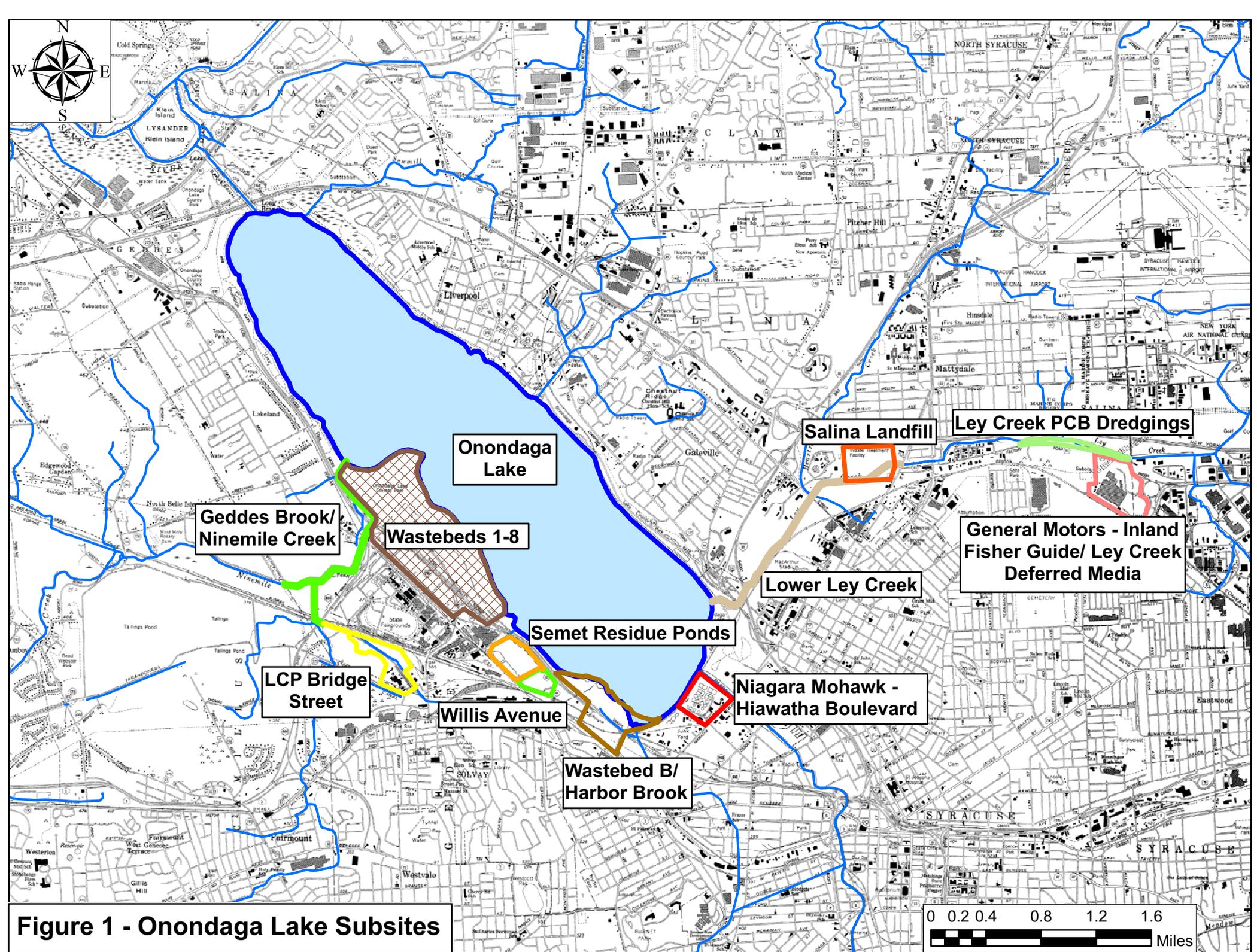


Figure 1 - Onondaga Lake Subsides

Date Revised: 5/19/2011 4:46:28 PM

Path: C:\GIS\GIS_Label\WBB_HBM\XDE\IECA\IRMs.mxd



- Willis/Semet IRM Barrier Wall
- West Wall Portion of the WBB/HB IRM
- East Wall Portion of the WBB/HB IRM
- NYSDEC/EPA Approved Wetland Boundaries
- Sediment Management Unit (SMU) Boundary
- Area Backfilled to Elevation 365 ft.
- Dredge Spoils Area

Note: The East Flume has subsequently been filled in to elevation 365 (NAVD 88).

400 200 0 400
Feet

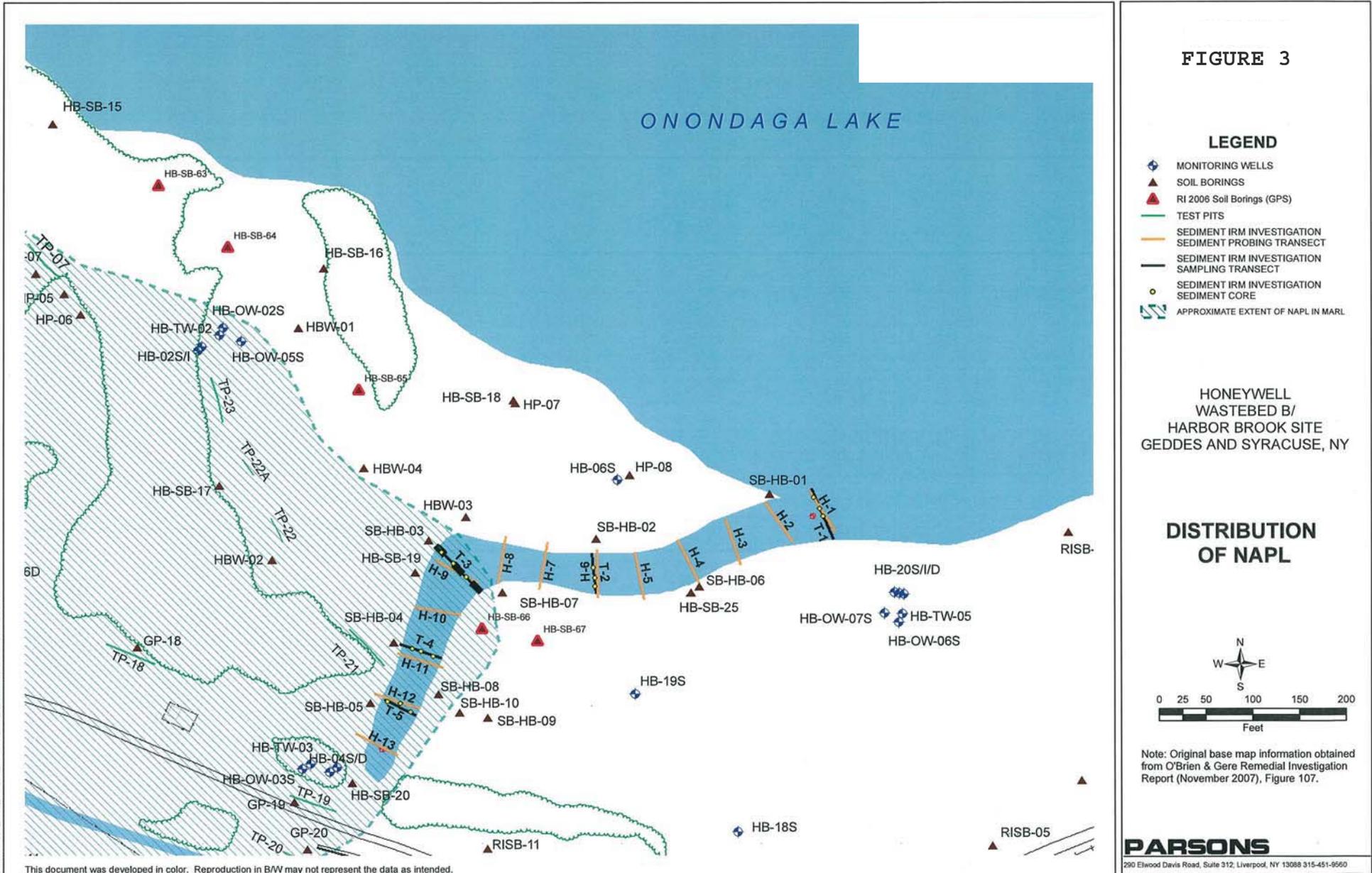
FIGURE 2

Honeywell Onondaga Lake
Syracuse, New York

East Flume, DSA #2, AOS-1
and Wetland Areas

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FIGURE 3



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Willis/Semet IRM Barrier Wall
West Wall Portion of the WBB/HB IRM
East Wall Portion of the WBB/HB IRM
Sediment Management Unit (SMU) Boundary
Wastebed B/Harbor Brook Site Boundary

Note: The East Flume has subsequently been filled in to elevation 365 (NAVD 88).

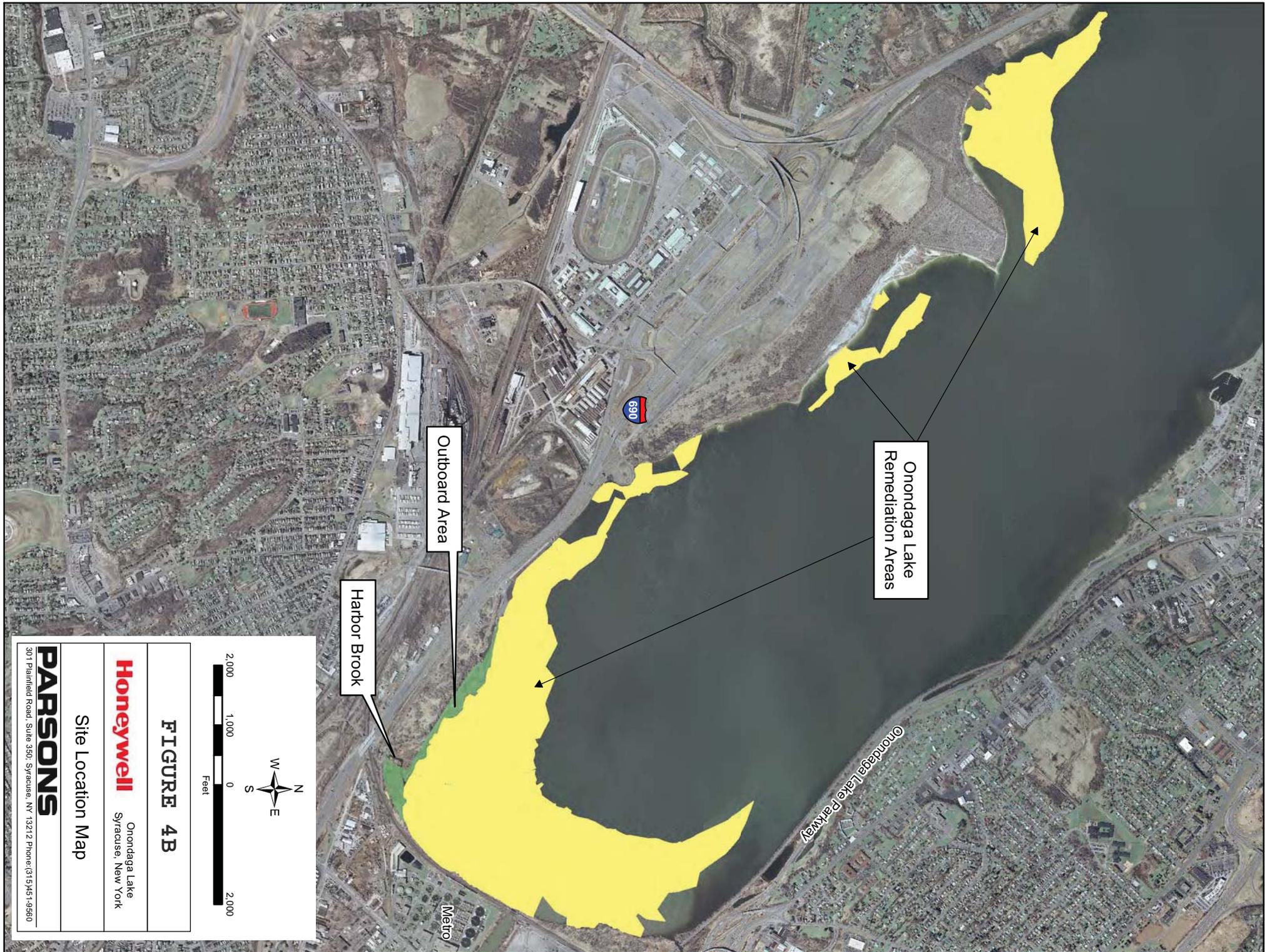
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FIGURE 4A

Honeywell Onondaga Lake
Syracuse, New York

Wastebed B/Harbor Brook Site
and Outboard Area

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Outboard Area

Harbor Brook

Onondaga Lake
Remediation Areas

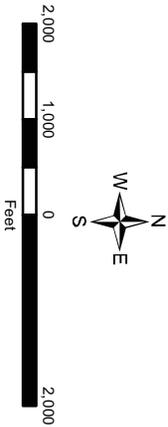


FIGURE 4B

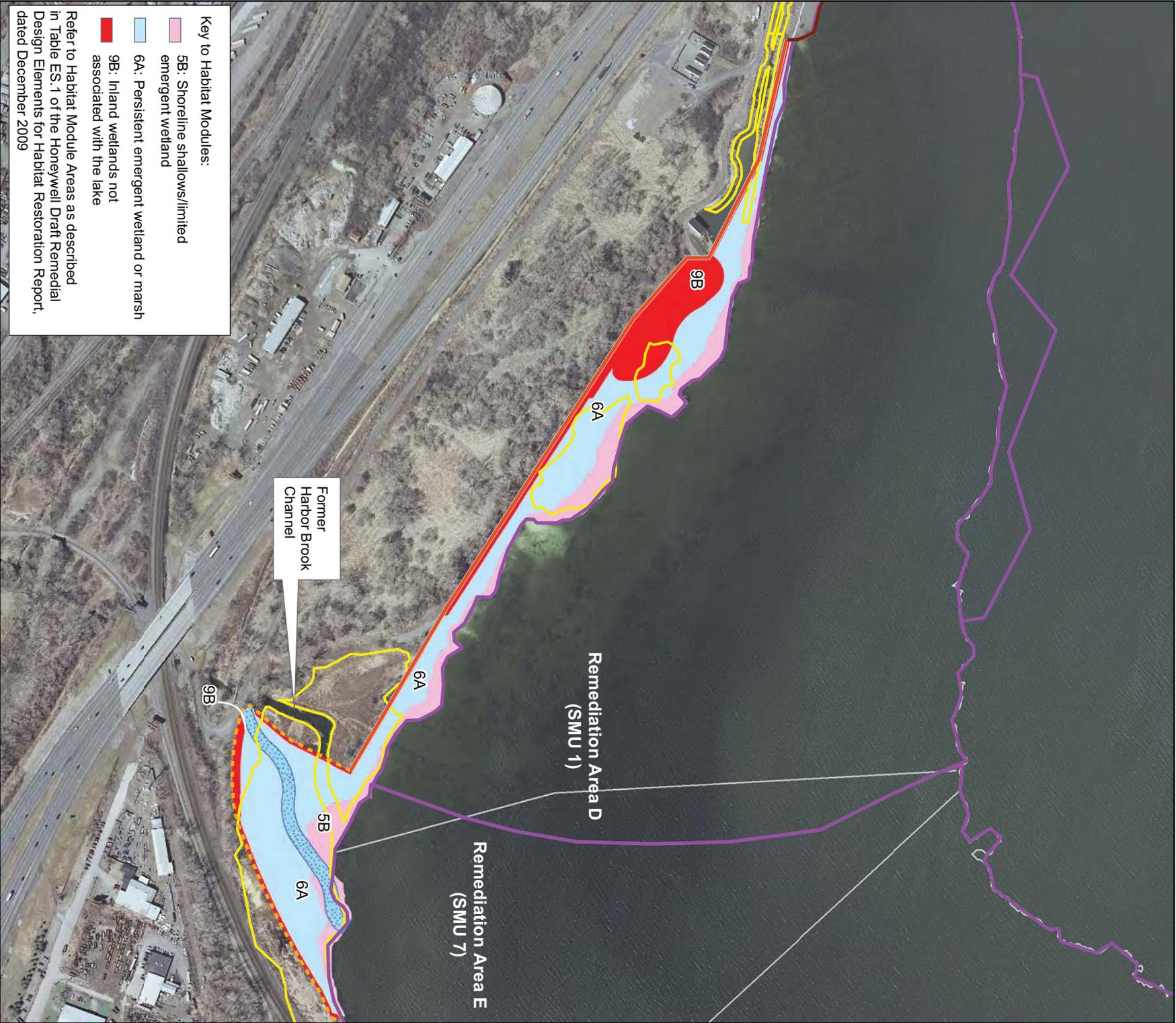
Honeywell

Onondaga Lake
Syracuse, New York

Site Location Map

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Key to Habitat Modules:

- 5B: Shoreline shallows/limited emergent wetland
- 6A: Persistent emergent wetland or marsh
- 9B: Inland wetlands not associated with the lake

Refer to Habitat Module Areas as described in Table ES. 1 of the Honeywell Draft Remedial Design Elements for Habitat Restoration Report, dated December 2009

- NYSDEC Approved Wetland Boundaries
- Sediment Management Unit (SMU) Boundary
- Remediation Area Boundary (Parsons, 2010)
- Approximate Final Harbor Brook Channel Alignment

- Willis/Semet IRM Barrier Wall
- West Wall Portion of the WB-B/HB IRM Barrier Wall
- East Wall Portion of the WB-B/HB IRM Barrier Wall

Note: The East Flume has subsequently been filled in to elevation 365 (NAVD 88).

Former Harbor Brook Channel

Remediation Area D (SMU 1)

Remediation Area E (SMU 7)

FIGURE 5

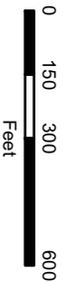


Orangetown Lake
Syracuse, New York

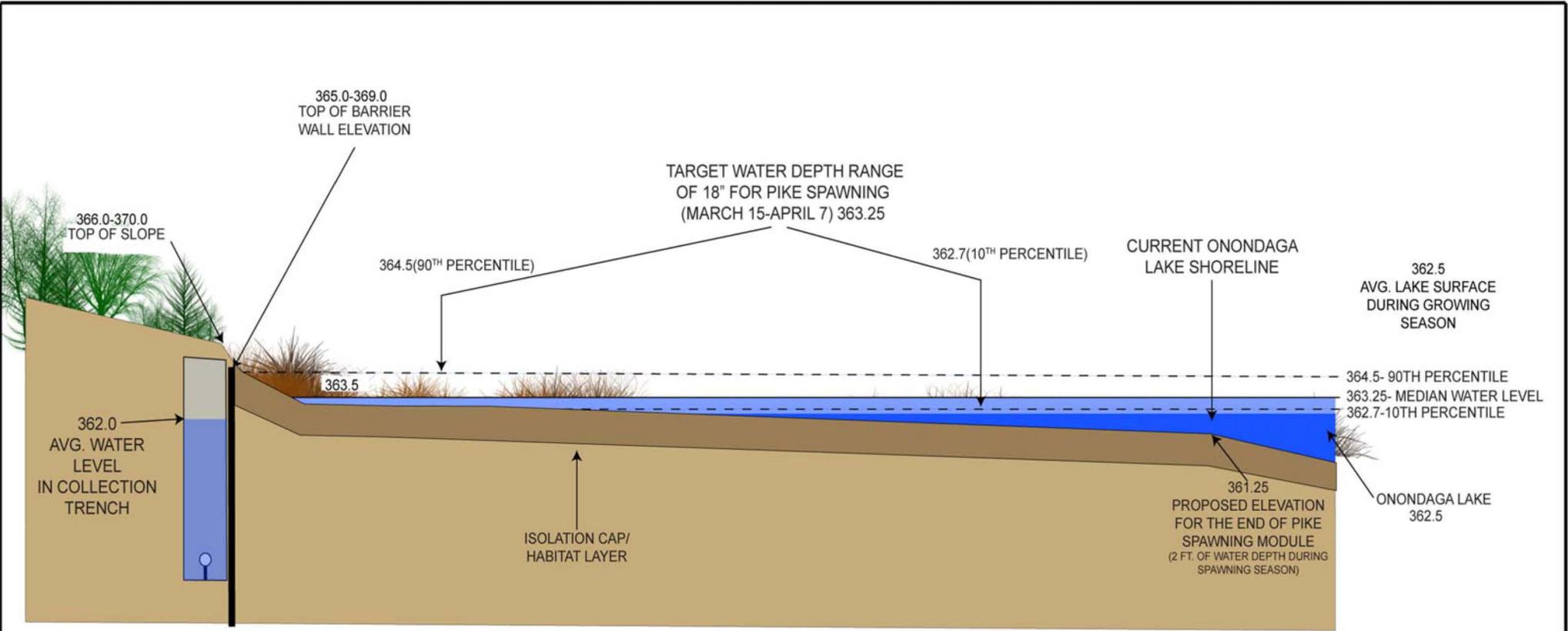
Conceptual Plan for Outboard Area Habitat Restoration



301 PLAINFIELD RD. SUITE 350, SPACEDALE, NY 13212



New York State Digital Orthorectification from 2009



MEDIAN LAKE LEVEL DURING
PIKE SPAWNING SEASON



MEDIAN LAKE LEVEL DURING
GROWING SEASON

NOT TO SCALE

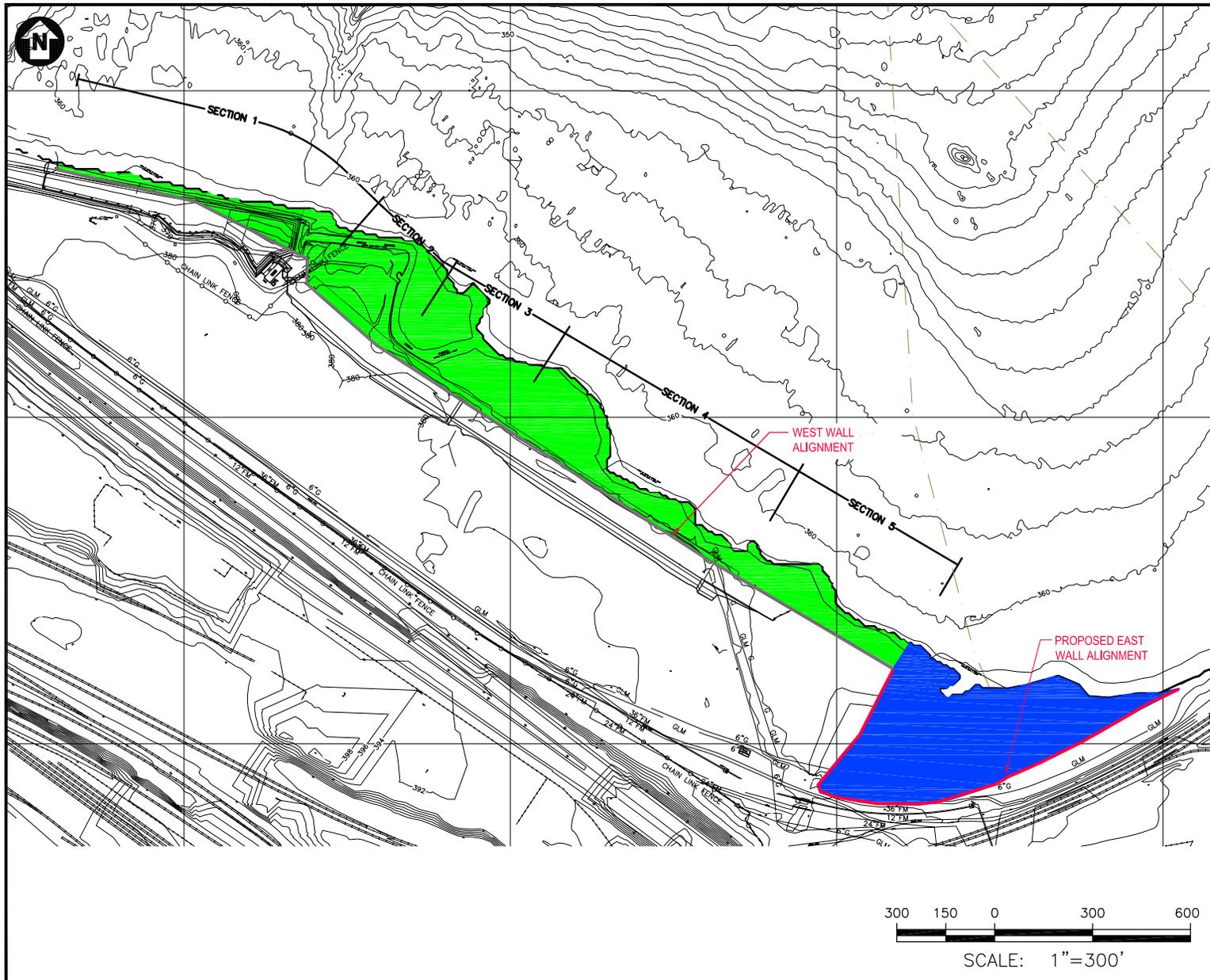
FIGURE 6

Honeywell Onondaga Lake
Syracuse, New York

RESPONSE ACTION 2
REMOVAL AND RESTORATION
CONCEPTUAL CROSS SECTION

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LEGEND:

- 360 — EXISTING GROUND ELEVATION (FEET) (NOTE 1)
- - - EXISTING SHORELINE
- PROPOSED WEST WALL ALIGNMENT
- 370 — PROPOSED CONTOURS (5 FT)
- PROPOSED EAST WALL ALIGNMENT

PROPOSED EXCAVATION DEPTH
SEE NOTE 3

- 2-3 METERS
- 1-2 METERS

NOTES:

1. THE WB-B/HB TOPOGRAPHIC MAP DATED APRIL 18, 2008 WAS PREPARED BY CNY LAND SURVEYING. THE LAKE BATHYMETRIC CONTOUR MAP IS DATED 2006.
2. EXCAVATION DEPTHS PROVIDED SHOW ANTICIPATED MINIMUM REMOVAL FOR SUBSEQUENT PLACEMENT OF THE CAP AND HABITAT LAYER.
3. FIGURE SHOWS AVERAGE REMOVAL DEPTHS. THE ACTUAL REMOVAL DEPTHS AND ELEVATIONS WILL VARY THROUGHOUT THE AREA TO ACCOMMODATE THE EXISTING GRADE, TOP OF WALL ELEVATION, AND PROPOSED HABITAT FEATURES.
4. EAST FLUME HAS BEEN BACKFILLED TO ELEVATION 365 (NAVD 88)

FIGURE 7

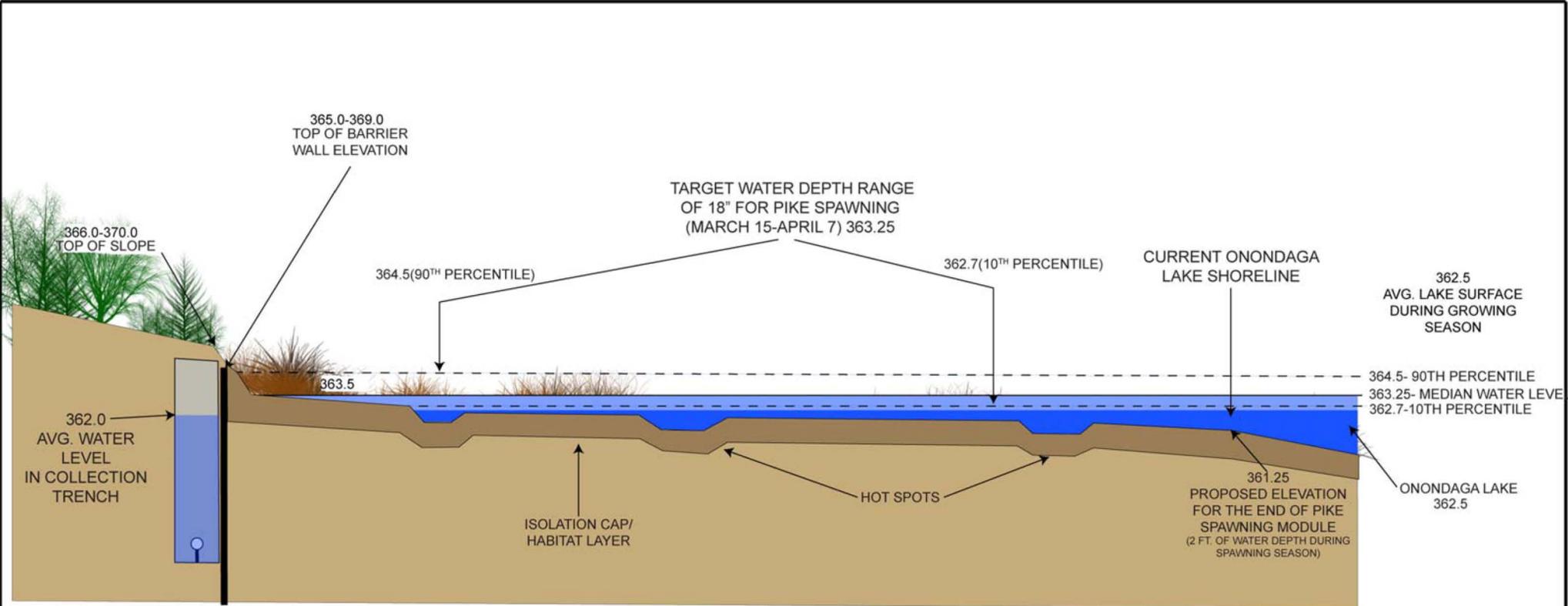
Honeywell

ONONDAGA LAKE WBB/HB IRM OUTBOARD AREA

REMOVAL DEPTHS & AREAS
RESPONSE ACTION 2

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OFFICES IN PRINCIPAL CITIES



MEDIAN LAKE LEVEL DURING
PIKE SPAWNING SEASON



MEDIAN LAKE LEVEL DURING
GROWING SEASON

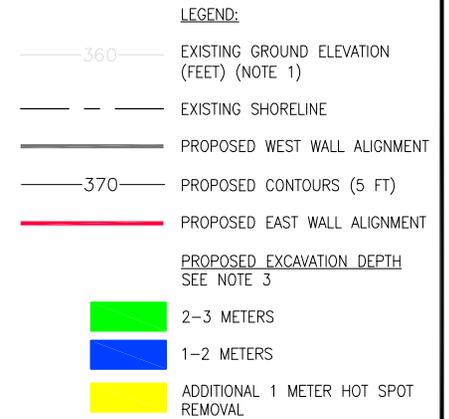
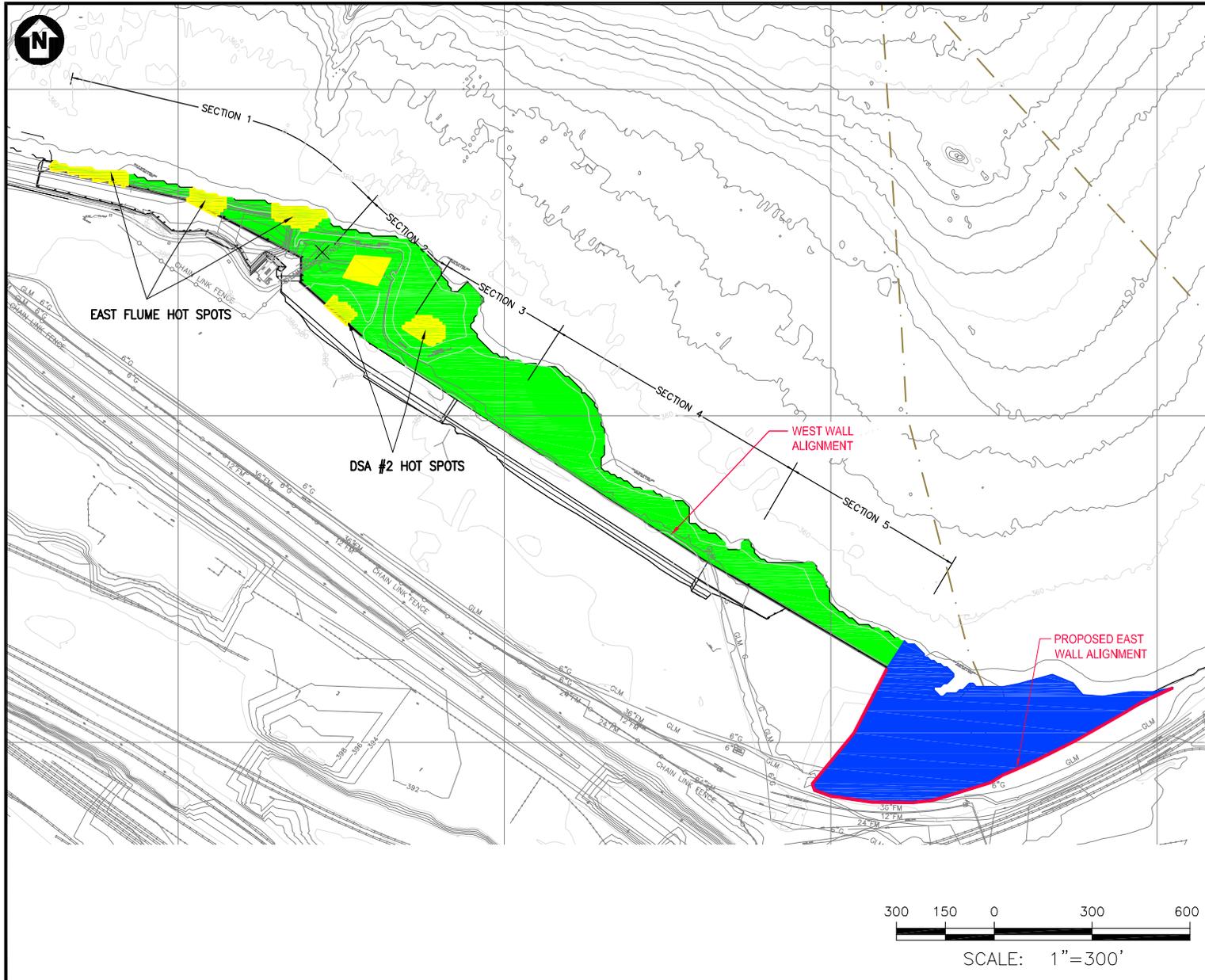
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FIGURE 8

Honeywell Onondaga Lake
Syracuse, New York

RESPONSE ACTION 3
REMOVAL AND RESTORATION
CONCEPTUAL CROSS SECTION

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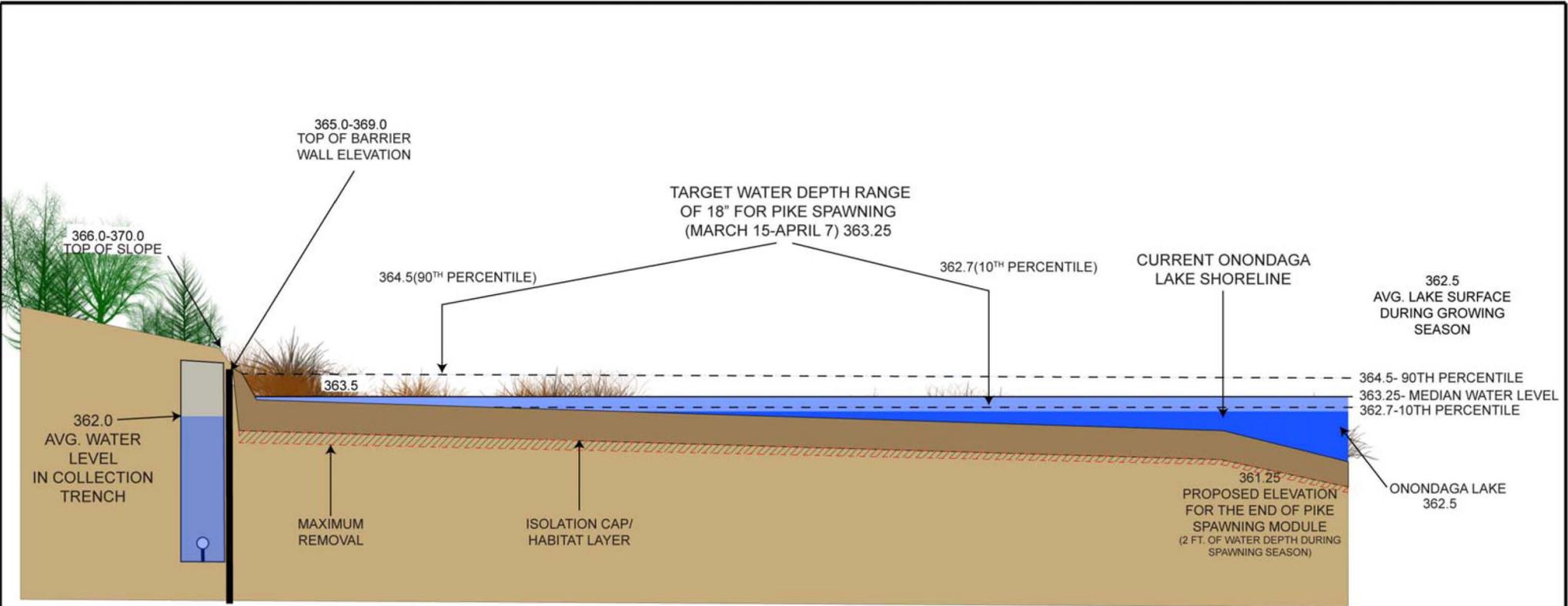
NOTES:

1. THE WB-B/HB TOPOGRAPHIC MAP DATED APRIL 18, 2008 WAS PREPARED BY CNY LAND SURVEYING. THE LAKE BATHYMETRIC CONTOUR MAP IS DATED 2006.
2. EXCAVATION DEPTHS SHOWN FACILITATE REMOVAL OF MATERIAL FOR SUBSEQUENT PLACEMENT OF THE OUTBOARD CAP AND HABITAT LAYER AND FOR REMOVAL OF HOT SPOTS AND POTENTIAL HOT SPOTS.
3. FIGURE SHOWS AVERAGE REMOVAL DEPTHS. THE ACTUAL REMOVAL DEPTHS AND ELEVATIONS WILL VARY THROUGHOUT THE AREA TO ACCOMMODATE THE EXISTING GRADE, TOP OF WALL ELEVATION, AND PROPOSED HABITAT FEATURES.
4. EAST FLUME HAS BEEN BACKFILLED TO ELEVATION 365 (NAVD 88)

FIGURE 9

Honeywell
ONONDAGA LAKE WBB/HB IRM OUTBOARD AREA
REMEDIAL DEPTHS & AREAS
RESPONSE ACTION 3

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MEDIAN LAKE LEVEL DURING
PIKE SPAWNING SEASON



MEDIAN LAKE LEVEL DURING
GROWING SEASON

NOT TO SCALE

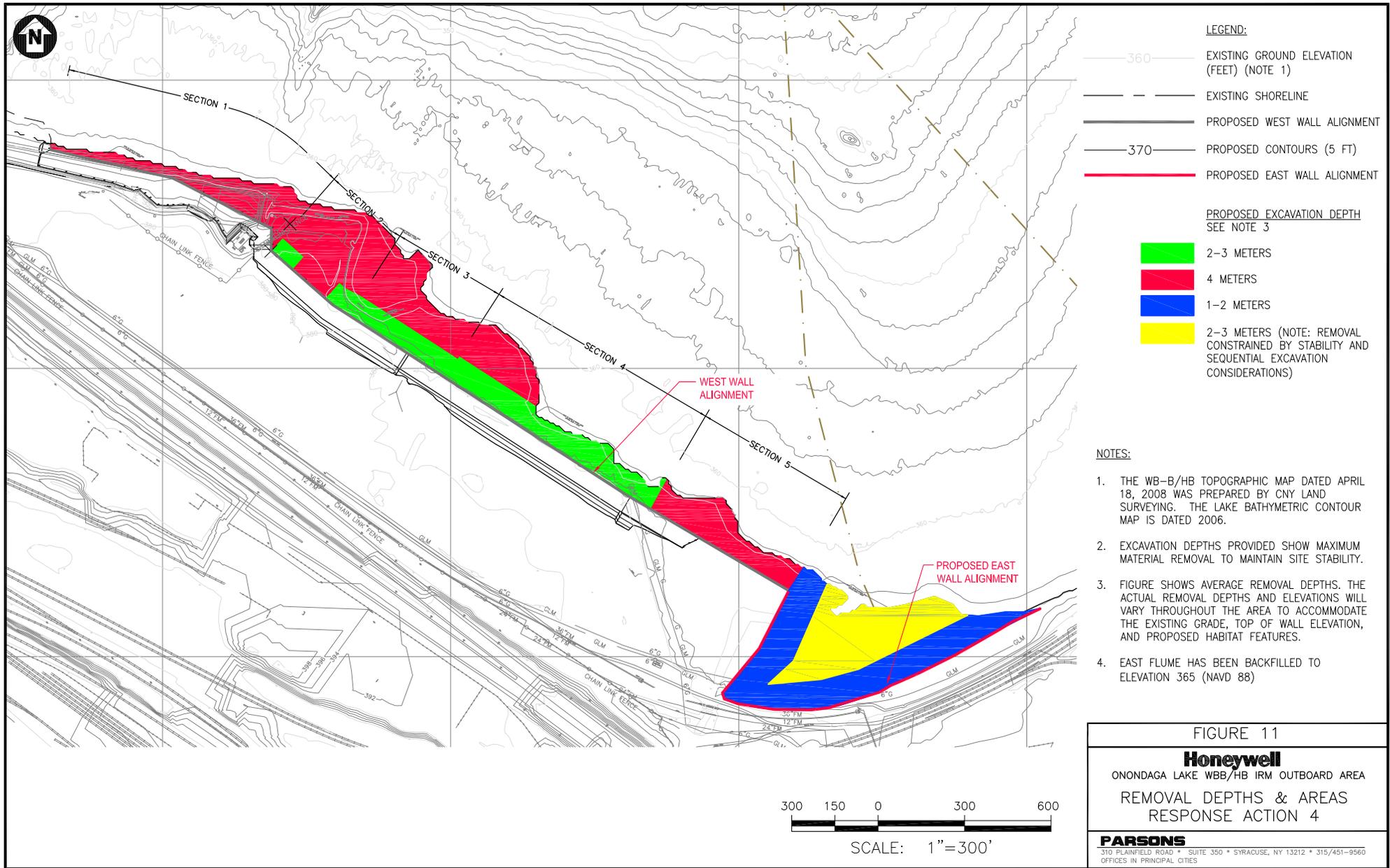
FIGURE 10

Honeywell Onondaga Lake
Syracuse, New York

RESPONSE ACTION 4
REMOVAL AND RESTORATION
CONCEPTUAL CROSS SECTION

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Appendix E-2
January 20, 2012 Public Notice

THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION INVITES PUBLIC COMMENT ON A PROPOSED INTERIM REMEDIAL MEASURE FOR THE WASTEBED B/HARBOR BROOK SITE AS WELL AS PROPOSED APPROACHES FOR MANAGING MATERIALS EXCAVATED AS PART OF REMEDIAL ACTIVITIES AT THE WASTEBEDS 1-8 SITE AND AT NINEMILE CREEK. The New York State Department of Environmental Conservation (DEC) and U.S. Environmental Protection Agency (EPA) continue to address remediation sites adjacent to Onondaga Lake in conjunction with the lake bottom dredging project. If preparation for operations to begin in 2012 exact areas to be dredged continue to be defined. These areas include portions of the Wastebed B/Harbor Brook (WBB/HB) Wastebeds 1-8, and Geddes Brook. Ninemile Creek sites As explained below and in a January 2011 Fact Sheet, hydraulic dredging will be employed during the remediation of each of these areas. As planned, the dredged slurry (sediment and water mixture) will be piped to the Sediment Consolidation Area (SCA) located on Wastebed 13. Consistent with the legal agreement governing the cleanup, the amount to be dredged will be less than 2.6 million cubic yards and within the original de-

sign capacity of the SCA. The final dredged estimate is currently anticipated to be more likely in the 2.2 million cubic yard range and will be included in the "Onondaga Lake Capping, Dredging, Habitat and Profundal Zone (Sediment Management Unit 8) Final Design". This design document will be finalized in the Spring of 2012 and is the culmination of all previous draft design documents related to capping, dredging, habitat restoration, and the profundal zone that were released to the public for review beginning in 2009 through the present. Wastebed B/Harbor Brook Outboard Area The NYSDEC and EPA will hold a public meeting at 7:00 PM and open house from 6:00 - 7:00 PM on February 1, 2012 at the Martha Edwy Room in the Art and Home Center at the New York State Fairgrounds, Syracuse, New York (in case of severe weather, notice will be given to local media outlets that the meeting will be postponed until Thursday, February 9, 2012 at the same time and location) to discuss the Proposed Response Action Document (PRAD) for the WBB/HB site. Outboard Area Interim Remedial Measure (IRM). The WBB/HB site is a subsite of the Onondaga Lake Superfund Site. The PRAD describes the response actions considered under the IRM associated with the Outboard Area and identifies the

preferred response action with the rationale for the action. The NYSDEC and EPA are soliciting the PRAD to encourage and receive input and comments from the public. The primary objective of the action is to control the sources of contamination at the site, to minimize the migration of contaminants, and to minimize any current and potential future human health and environmental impacts. The main features of the preferred response action for the Outboard Area IRM includes the removal of soils and wetland sediments via hydraulic dredging and mechanical methods between the Harbor Brook barrier walls (East and West Walls) and Onondaga Lake. Placement of an isolation cap, and restoration of the area as wetlands. The excavated area would be restored and/or mitigated as appropriate, consistent with the Onondaga Lake habitat restoration plan. Changes to the preferred response or a change from the preferred response to another response may be made if public comments or additional data indicate that such a change will result in a more appropriate action. The final decision regarding the selected response will be made after the NYSDEC and EPA have taken into consideration all public comments. The NYSDEC and EPA are soliciting public comment on all of the response action options

associated with the Outboard Area IRM because NYSDEC and EPA may select a response action other than the preferred response action. The administrative record file, which contains the information upon which the selection of the response action will be based, is available at the following locations. Information is also available on DEC's website at www.dec.ny.gov/chemical/37558.html, Onondaga County Public Library, 447 South Salina Street, Syracuse, New York 13202, 315-435-1800 Atlantic States Legal Foundation, 638 West Onondaga Street, Syracuse, New York 13204, 315-475-1170. Please call for hours of availability. Solvay Public Library, 615 Woods Road, Solvay, NY 13209. Phone: (315) 468-2441. NYSDEC, 615 Erie Boulevard, West, Syracuse, New York 13204-2400, 315-426-7400. Please call for an appointment. NYSDEC, DER, 625 Broadway, 12th Floor Albany, New York 12223-7013, 518-402-9676. Please call for an appointment. Written comments associated with the PRAD received during the public comment period, which ends on February 20, 2012, as well as comments received at the public meeting, will be addressed in the decision document which will formalize the selection of the response action. All written comments associated with the PRAD should be addressed to: Mr. Tracy

A. Smith, Project Manager, NYS Department of Environmental Conservation, 625 Broadway, 12th Floor, Albany, NY 12233-7016. DERweb@gw.dec.state.ny.us (indicate "WB8 HB Outboard Area IRK Comments" in the subject line of the e-mail). Material Management at the Wastebeds 1- and Geddes Brook Ninemile Creek Site During the construction of a 2.3-acre lake connected wetland, the Wastebeds 1-site, hydraulic dredging would be used to remove approximately 41,500 cubic yards of materials from the site. As part of the cleanup of low Ninemile Creek, hydraulic dredging would be used to remove approximately 20,000 cubic yards of contaminated sediment from the two small peninsulas extending out on both sides of the mouth of Ninemile Creek. In addition, up to approximately 30,000 cubic yards of sediment may be removed by hydraulic dredging from the channel in low Ninemile Creek. Ninemile Creek materials (67,000 to 97,000 cubic yards) removed from channels and floodplain areas the remaining areas of the Geddes Brook Ninemile Creek Site would likely be removed via mechanical excavation and consolidated at the L Bridge Street subsidence containment system. The volume estimates do not include materials to be removed from the SWW-10 forested

wetland area. An investigation to determine what portions of the SWW-10 area will require remediation is being performed and the remedial design and volume estimates for the SWW-10 area will be developed separately. Materials removed via hydraulic dredging from these areas would be piped as slurry (sediment and water mixture) to the Sediment Consolidation Area (SCA) located on Wastebed 13. NYSDEC will accept written public comments regarding the proposed means for managing the waste materials that will be removed during the construction of Wastebeds 1-8 and Ninemile Creek during the public comment period ending on February 20, 2012. Comments should be mailed or emailed to: Mr. Timothy Larson, P.E., NYSDEC, 625 Broadway, 12th Floor, Albany, New York 12233-7016. Email: derweb@gw.dec.state.ny.us. Please indicate "Onondaga Lake Material Management" in the subject line. Project documents are available for review on the NYSDEC website (www.dec.ny.gov/chemical/37558.html) and at the NYSDEC Syracuse and Albany offices, Atlantic States Legal Foundation, Solway Library, and the Onondaga County Public Library (addresses listed above). Additional information on the Onondaga Lake Bottom Project is also available at: Camillus Town Hall, 4600

West Genesee Street,
Room 100 Syracuse,
NY 13219 (315) 488-
1234 Moon Library
SUNY ESF, 1 Forestry
Drive Syracuse, NY
13210 (315) 470-6712

Appendix E-3
Letters Submitted During the Public Comment Period

Mr. Tracy Smith
NYS DEC
625 Broadway, 12th Floor
Albany, NY 12233-7013

February, 17 2012

Dear Mr. Smith,

Please add this letter to the Public Comments for Wastebed B Harbor Brook Outboard Area Interim Remediation Response Action Document.

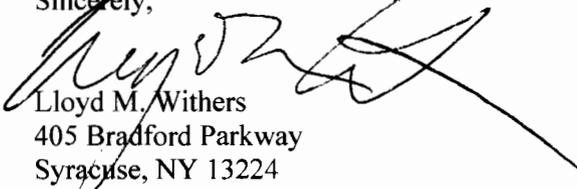
I write to you today with an evolving sense of frustration, disappointment, and animosity over the DEC's decisions for Onondaga Lake's remediation. The selected alternative for Wastebed B-Harbor Brook Outboard Area is yet another example of a decision ultimately allowing Honeywell's waste to remain in, and around Onondaga Lake, and, therefore allowing the continued threat to the health and well being of the people and the wildlife that come into contact with the lake. The remedy should be rejected.

The decision to allow Wastebed B to remain means the DEC is officially assenting to Honeywell's creation of a shoreline for Onondaga Lake consisting of hazardous wastes that were intentionally put into the lake. Had that site been created by a catastrophic accident, an Act of God, or even through some demonstrated stupendous amount of ignorance of its negative impact on the environment, then allowing it to remain in place for so long could, at the least, be understandable. No such reasonable explanation is applicable here as these sites were created purely for business convenience.

It is the NYS DEC's obligation to see that this problem is remediated "to the extent practicable", meaning, in the realm of possibility. This would suggest that the appropriate remedy would be the excavation and removal of all waste and contaminated soil and sediment from the site. The same approach should be employed at Wastebeds 1-8, as well. History suggests it is surely practicable as there are many examples of much larger excavations completed without the aid of powerful modern equipment. Ancient civilizations responsible for building the Pyramids of Egypt, the temples of Greece, and the cities of Rome and of the Aztecs feature much larger excavations completed with only simple tools and rudimentary machines. Even the Erie Canal was built with nothing more than men with shovels and horses.

The time has finally come to hold the multi-billion dollar corporation that created this atrocity accountable for its business decisions. The NYS DEC should demand the removal of their industrial waste.

Sincerely,



Lloyd M. Withers
405 Bradford Parkway
Syracuse, NY 13224

305 Cherry Road
Syracuse, NY 13219-1508
February 25, 2012

Tracy Smith
NYS DEC
625 Broadway, 12th Floor
Albany, NY 12233-7013

Dear Mr. Smith:

Please add this letter to the public comments for Wastebed B Harbor Brook Outboard Area Interim Remediation Response Action Document, relating to Onondaga Lake.

I believe it is clear that the decision to allow Wastebed B to remain is an abdication of the DEC's responsibility/obligation, on behalf of **all** of the citizens of Onondaga County, indeed all of the citizens of this state as a whole, to insure that the problem created by Honeywell's predecessor is remediated "to the extent practicable". Certainly a more vigorous plan of remediation is possible and must be mandated. A proper remedy would be to require the excavation and removal of **all** waste and contaminated soil and sediment from the site. Justice demands that the site be returned to the state/condition it was in before that wastebed was created in ignorance (at best) of the environmental impact of dumping these materials in and near the lake. Justice also demands that the parties responsible for creating this mess clean it up fully NOW, not at some unknown time in the future. We have lived with a horribly contaminated lake for far too long. Nothing less than a complete clean-up will do.

We must hold the multi-national, billion dollar corporation that created this mess responsible for FULLY cleaning up its mess. Millions upon millions of dollars were made over the entire period these wastes were dumped in the lake. Further delay is both unjust and unconscionable.

Very truly yours,


MICHAEL J. HUNGERFORD

RECEIVED

FEB 28 2012

REMEDIAL BUREAU D

Tracy Smith - Cleanup of Onondaga Lake"WBB/HB Outboard IRM Comments

From: "Joel Potash" <jpotash1@twcny.rr.com>
To: <derweb@gw.dec.state.ny.us>
Date: 2/19/12 3:19 PM
Subject: Cleanup of Onondaga Lake"WBB/HB Outboard IRM Comments

Re: WBB/HB Outboard Area IRM Comments;

The area outside the steel inserts meant to contain polluted land/water also needs to be treated. If not the materials will eventually if they have not already, sink low enough to cross under the barriers into the lake. Also, since the area outside the lake will be for public use, removal of contaminated materials is essential. Let's do it right.

Joel Potash MD