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

December 2010

PURPOSE OF THIS DOCUMENT

This Proposed Response Action Document (PRAD) describes the response actions considered for minimizing the release of contaminants into Lower Harbor Brook (a subsite of the Onondaga Lake site) 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, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The response actions summarized here are described in more detail in O'Brien & Gere's April 2010 Engineering Evaluation/Cost Analysis (EE/CA)[2], Harbor Brook Interim Remedial Measure. NYSDEC and EPA encourage the public to review the EE/CA to gain a more comprehensive understanding of the site and 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, as well as the preferred response action.

NYSDEC and EPA's preferred response action consists of installing a subsurface barrier wall to the east of Lower Harbor Brook and rerouting the Lower Harbor Brook channel.

The response action described in this document is the *preferred* response action for the "East Wall" Area of the site. (See description of "East Wall" 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 remedial 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 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.

[1] An IRM is a discrete set of activities which can be undertaken without extensive investigation and evaluation to prevent, mitigate, or remedy environmental damage. IRMs are implemented, where appropriate, to address priority risks and to help move sites more quickly through the Superfund process.

[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).

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 December 24, 2010 and concludes on February 10, 2010.

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 January 13, 2011. The public meeting will be held at 7:00 PM and open house 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. In addition, the PRAD for the Wastebeds 1-8 site IRM will also be discussed.

Comments received during the comment period will be incorporated into 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
Hours: M, Th, F, Sat, 9:00 a.m. – 5:00 p.m.; Tu, W, 9:00 a.m. – 8:30 p.m.
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 "Wastebed B/Harbor Brook 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 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 (sub-sites) 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 Wastebed B/Harbor Brook 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 Wastebed B/Harbor Brook subsite of the Onondaga Lake Superfund site. The IRM for the Wastebed B/Harbor Brook subsite is intended to be consistent with, and an integral part of, the final 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 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 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 activities (Parsons, 2008c). Dredging in the lake is scheduled to begin in May 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. Remedial construction included 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 (lakeshore barrier wall/collection system for the shallow and intermediate zones) of the groundwater remedy component were completed in 2007. Construction of the remaining portion (groundwater collection system adjacent to Tributary 5A) is underway. 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 ongoing design, it was determined that one of the landfills does not contain significant hazardous waste. 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 on November 29, 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 cubic yards 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 will be constructed at Wastebed 13 as part of the remediation of the Onondaga Lake Bottom subsite in accordance with the 2005 ROD.

A ROD for the Niagara Mohawk – Hiawatha Boulevard – Syracuse Former MGP site was signed on March 31, 2010. The selected remedy calls for contaminated soil in the northeastern portion of the site that could leach contaminants to ground water to be solidified in place and ground water along the northern perimeter of the site will 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 RI/FS ongoing at the Wastebeds B/Harbor Brook site, 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 Wastebed B/Harbor Brook 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, Lakeshore Area (including Wastebed 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 Wastebed B/Harbor Brook RI/FS.

History of Site Operations

Wastebed B is a former Solvay wastebed which received Solvay waste (generated by Allied Chemical Corporation operations) from approximately 1898 to 1926. Wastebed 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 Remedial Investigations

Investigations at the site indicate that four primary source areas are present within the Wastebed B/Harbor Brook Site. 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, and xylene (BTEX), chlorinated benzenes, naphthalene and other polycyclic aromatic hydrocarbons (PAHs), phenolic compounds, 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) 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 Wastebed 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

In 2003, Honeywell International, Inc. and NYSDEC entered into an Order on Consent (Index #D7-0008-01-09) to conduct an IRM for Wastebed B/Harbor Brook. 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 was to be determined as part of the IRM design. 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 4). 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 East Wall area is the focus of the EE/CA and this Proposed Response Action Document.

Although they are not the subject of the EE/CA for the Wastebed B/Harbor Brook IRM, additional remedial activities will need to be performed under the IRM in Upper Harbor Brook (areas upstream of the mouth of Harbor Brook from Culvert #1 upstream to OW #5; see Figures 5 and 6), and its associated tributaries, prior to the final restoration of Lower Harbor Brook. These

additional remedial activities will be implemented regardless of which specific response action is selected.

Other Wastebed B/Harbor Brook Site Areas/Media

The East Flume is being addressed under an IRM pursuant to an April 2002 Consent Order with NYSDEC. This includes slip-lining a 72-inch pipe which currently conveys storm water to the East Flume. The pipe will be extended to discharge the storm water directly to Onondaga Lake. The slip-lining will be done to prevent contaminated ground water from bypassing the ground water collection system and discharging into Onondaga Lake. A 42-inch sewer will be abandoned. The pipe will be plugged and its catch basins will be filled with concrete. A 60 inch pipe, which currently discharges to the East Flume, will have three 12-inch pipes placed within it. The annular space within the 60-inch pipe will be filled with flowable grout to prevent ground water from migrating within it. The three 12-inch pipes may be used in the future for water conveyance from the lakeshore area to the Willis Avenue Ground Water Treatment Plant (GWTP). An additional IRM (Outboard Area IRM) that addresses the removal of sediment and soil between the West Wall and East Wall barrier walls and Onondaga Lake will be evaluated in a subsequent EE/CA. Other site areas and media which will not be remediated under the Wastebed B/Harbor Brook, East Flume, or Outboard Area IRMs will be addressed under the Wastebed B/Harbor Brook RI/FS.

SUMMARY OF SITE RISKS

A Streamlined Risk Evaluation (SRE) was prepared for this portion of the Wastebed B/Harbor Brook site and is included in the EE/CA. 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 are taken at the Site. A summary of the human health and ecological evaluations are provided below.

Human Health Evaluation

The intended future use of the portion of the site affected by the IRM is for habitat enhancements, including wetland improvements. In addition, the area will also likely be used for recreational activities (*e.g*., biking along a bike trail). Current and future exposure scenarios in the area which were considered in the SRE include a trespasser, construction worker, surveillance worker, and recreational visitor. 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, sediment, ground water, and surface water of the Site which 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 COPCs for surface soils, sediments. Arsenic and mercury were also identified as COPCs for subsurface soil, ground water and surface water. PCBs were also identified as COPCs for subsurface soil. The HHRA for the Lake Bottom subsite determined that arsenic, dioxins, mercury, and PCBs were the primary risk drivers associated with the consumption of fish from the lake. EPA 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, sediment, surface water, and ground water were identified by screening the maximum detected concentrations in Site

media against recommended conservative ecologically-based screening criteria and/or guidance values.

Arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc were among the surface soil COPECs. These COPECs were also identified in the Onondaga Lake Baseline Ecological Risk Assessment (BERA) as contaminants of concern (COCs) which were risk drivers associated with the potential for phytotoxic effects in soil.

Sediment COPECs included metals (antimony, arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc), benzene, ethylbenzene, toluene, xylenes, chlorobenzenes, PAHs, chlordane isomers, DDT and metabolites, dieldrin, and heptachlor/heptachlor epoxide. These COPECs were also identified as sediment COCs in the Onondaga Lake BERA. In addition, PCBs and dioxins/furans (2,3,7,8-TCDD equivalents) were detected in Site sediment and have been identified as sediment COCs in the Onondaga Lake BERA.

Surface water COPECs included metals (barium, copper, lead, manganese, mercury, zinc, and cyanide), chlorobenzenes, and bis(2-ethylhexyl)phthalate. These compounds also were identified as exceeding surface water criteria in the Onondaga Lake BERA. In addition, metals (antimony, arsenic, chromium, mercury, selenium, vanadium, and zinc), DDT and metabolites, endrin, PCBs, and dioxin/furans were identified in the Onondaga Lake BERA as surface water COCs impacting fish.

Ground water COPECs including metals (barium, copper, lead, manganese, mercury, zinc, and cyanide), chlorobenzenes, and bis(2-ethylhexyl)phthalate were identified as surface water COCs in the Onondaga Lake BERA.

Conclusions

The identification of COPCs and 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 and risk drivers in the Onondaga Lake HHRA and BERA. Contaminated sediment and surface water from the Site have the potential to directly impact sediment and surface water in the lake. Surface soils in the proposed remediation area have the potential to enter the lake and remain at the bottom as sediment. Contaminated subsurface soil and ground water from the site have the potential to impact Harbor Brook and the lake via ground water migration. Therefore, response actions at the portion of the Site 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 site-related contaminants.
• Unacceptable potential risks due to elevated levels of site-related contaminants in soils, sediment, surface water, and ground water.
• Actual or potential contamination of sensitive ecosystems.

RESPONSE ACTION OBJECTIVES

The Wastebed B/Harbor Brook IRM objectives are to:

• Eliminate, to the extent practicable, the discharge of contaminated ground water and NAPL into Harbor Brook and Onondaga Lake.
• Eliminate, to the extent practicable, potential impacts to human health and to the environment (e.g., to fish and wildlife resources)

SUMMARY OF RESPONSE ACTIONS

Three potential response actions to address the East Wall alignment were developed, as described below.

Response Action 1: No Action

Capital Cost	$0
Annual O&M Cost	$0
Present-Worth O&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 site monitoring. This response action is used as the baseline against which the other Response Actions are evaluated.

Response Action 2: Install Barrier Wall West of Lower Harbor Brook

Capital Cost	$8,710,000
Annual O&M Cost	$64,000
Present-Worth O&M Cost	$794,000
Total Present-Worth Cost	$9,504,000
Construction Time	1 year

This response action would involve the installation of approximately 600 linear ft of vertical barrier and an upgradient groundwater collection system to the west of Harbor Brook, as shown on Figure 7. The vertical barrier would consist of a sealed-joint sheet pile wall that would be keyed into the silt and clay layer at approximate depths between 25 ft and 40 ft bgs. The groundwater collection system would include a shallow groundwater collection trench, passive wells to collect groundwater in the "intermediate" aquifer located below the trench, collection sumps and conveyance piping, and a monitoring system. The barrier wall and collection system would serve to mitigate further discharges of NAPL and contaminated groundwater to Harbor Brook and Onondaga Lake. Collected groundwater would be treated at the Willis Avenue GWTP and discharged to the Metropolitan Syracuse Wastewater Treatment Plant (METRO).

NAPL-impacted soils that would remain outside of the wall adjacent to and beneath Harbor Brook would be excavated as shown on Figure 7 and placed on-site in an appropriate waste management unit.[3] The depth of excavation in this area would need to be further evaluated during the design. NAPL has been encountered in this area to depths of at least 20 ft bgs. However, due to the shallow groundwater table, the excavation depth would not be anticipated to be greater than 10 ft bgs. Therefore, NAPL-impacted soils below this depth would remain.

[3] The costs for an onsite waste management unit have been included in the cost estimate for this response action; the details for it would be developed during remedial design.

Following the removal activities, the excavated area, including Harbor Brook and the adjacent wetlands, would be restored and/or mitigated, as appropriate, consistent with the lakewide habitat restoration plan.

The final disposition of NAPL-impacted soils would be evaluated in the feasibility study for the Wastebed B/Harbor Brook Site.

Response Action 3: Install Barrier Wall to East of Lower Harbor Brook and Reroute Lower Harbor Brook Channel

Capital Cost	$6,360,000
Annual O&M Cost	$64,000
Present-Worth O&M Cost	$794,000
Total Present-Worth Cost	$7,154,000
Construction Time	1 year

This response action would involve the temporary relocation of the Lower Harbor Brook channel to the east of its current location and the installation of approximately 400 linear ft of vertical barrier and an upgradient groundwater collection system to the east of the existing Lower Harbor Brook Channel (west of the new channel) as shown on Figure 7. The permanent relocation and restoration of Lower Harbor Brook would be coordinated with remedial activities in the Outboard Area. Similar to Response Action 2, the vertical barrier would consist of a sealed-joint sheet pile wall that would be keyed into the silt and clay layer at approximate depths of between 25 ft and 40 ft bgs. The groundwater collection system would include a shallow groundwater collection trench, passive wells to collect groundwater in the “intermediate” aquifer located below the trench, collection sumps and conveyance piping, and a monitoring system.

The existing culvert at the proposed barrier wall would be decommissioned and replaced by a new culvert, as shown on Figure 7. The barrier wall and collection system would serve to mitigate further discharges of NAPL and contaminated groundwater to Harbor Brook and Onondaga Lake. The wall would be installed downgradient of the NAPL-impacted soils that have been identified in this area. Collected groundwater would be treated at the Willis Avenue GWTP and discharged to METRO.

The final disposition of NAPL-impacted soils upgradient of the wall would be evaluated during the Feasibility Study/Record of Decision for the Wastebed B/Harbor Brook Site. The excavated area, including the new Harbor Brook channel and the adjacent wetlands, would be restored and/or mitigated, as appropriate, consistent with the lakewide habitat restoration plan.

EVALUATION OF RESPONSE ACTIONS

To select a response action for a site, NYSDEC and EPA conduct a detailed analysis of the viable response actions. 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 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

Response Action 1 would not be effective in addressing the discharge of NAPL and contaminated ground water to Onondaga Lake and Harbor Brook and would not meet the IRM objectives.

Response Action 3 would be the most protective of human health and the environment since it addresses the discharge of NAPL and contaminated ground water to Onondaga Lake and Harbor Brook as the entire NAPL plume is contained within the limits of the barrier wall. Response Action 2 would protect human health and the environment by effectively containing contaminated ground water and NAPL located upgradient of the barrier wall and mitigating further migration or discharge of these contaminants from these areas into Harbor Brook or Onondaga Lake. However, under Response Action 2, NAPL-impacted material would remain outside the limits of the barrier wall with the potential of future discharge to Onondaga Lake and Harbor Brook. Therefore Response Action 3 would be better able to meet the IRM objectives than Response Action 2.

ARARs are anticipated to be achieved under Response Action 3. Wetlands impacted by Response Actions 2 and 3 would be restored and any wetlands lost as a result of the barrier wall installation would be mitigated. Response Action 3, in concert with other remedies, would contribute to meeting surface water ARARs for Onondaga Lake and Harbor Brook. Response Action 2 may not comply with surface water ARARs since residual NAPL-impacted soils would remain in place outside the barrier wall below the water table.

Under Response Action 2, installation of the barrier wall in conjunction with ground water collection would contain contaminated ground water and NAPL located upgradient of the wall, and mitigate further migration or discharge of these contaminants into Harbor Brook or Onondaga Lake. The excavation of shallow NAPL located downgradient of the barrier wall would permanently remove this contamination, reducing (but not eliminating) the volume of materials that may continue to migrate and provide a potential source of contaminant discharge to surface water. Assuming an average excavation depth of 10 ft bgs, approximately 11,000 cubic yards (CY) of material would be removed. Under Response Action 3, the barrier wall in conjunction with ground water collection would effectively contain contaminated ground water and NAPL in this area, and mitigate migration or discharge of these contaminants into Harbor Brook or

Onondaga Lake. In addition, the brook channel would be permanently relocated and restored in accordance with the Onondaga Lake Habitat Plan under Response Action 3.

Under both Response Actions 2 and 3, potential short-term risks to the community during construction would be associated with dust and vapors. These short-term risks are greater for Response Action 2 due to the excavation of NAPL-impacted soil at depths below the groundwater table. For both Response Actions 2 and 3, 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. 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. Adverse environmental impacts would be minimized through appropriate methods such as stormwater management and dust control.

Implementability

Response Action 1 would be the easiest to implement, as there are no activities to undertake.

Response Action 2 is likely more difficult to implement than Response Action 3, due to the need for excavation below the water table, the management and handling of additional contaminated soils and ground water under this IRM, and the greater potential for odor and dust issues.

Both Response Actions 2 and 3 would result in a loss of wetlands (due to the placement of the barrier wall) that would need to be restored and/or mitigated. Although Response Action 3 would result in a loss of approximately 0.6 acres more of wetlands than Response Action 2, this lost area would be mitigated consistent with the proposed lakewide habitat restoration plan.

Response Actions 2 and 3 would employ technologies known to be reliable and that can be readily implemented. In addition, equipment, services, and materials needed for these response actions are readily available, and the actions under these response actions would be administratively feasible.

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 O&M costs, and present-worth costs for each of the response actions are presented below.

Response Action	Capital Cost	Annual O&M Cost	Present-Worth O&M Cost	Total Present-Worth O&M Cost
1	$0	$0	$0	$0
2	$8,710,000	$64,000	$794,000	$9,504,000
3	$6,360,000	$64,000	$794,000	$7,154,000

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 2 is the most costly response action at an estimated present-worth cost of $9,504,000. Response Action 3 has an estimated present-worth cost of $7,154,000.

PREFERRED RESPONSE ACTION

NYSDEC and EPA's preferred response action, Response Action 3, includes installing a vertical barrier wall to the east of Lower Harbor Brook with the relocation and restoration of Lower Harbor Brook, and constructing an upgradient groundwater collection system to the east of the existing Lower Harbor Brook Channel (west of the new channel). The vertical barrier would consist of a sealed-joint sheet pile wall that would be keyed into the silt and clay layer at approximate depths of between 25 ft and 40 ft bgs. The wall would be installed downgradient of the NAPL-impacted soils that have been identified in this area. The existing culvert at the proposed barrier wall would be decommissioned and replaced by a new culvert, as shown on Figure 7. The groundwater collection system would include a shallow groundwater collection trench, passive wells to collect groundwater from the intermediate unit, collection sumps and conveyance piping, and a monitoring system. Collected ground water would be treated at the Willis Avenue GWTP and discharged to METRO. The excavated area, including the new Harbor Brook channel and the adjacent wetlands, would be restored and/or mitigated, as appropriate, consistent with the lakewide habitat restoration plan. The permanent relocation and restoration of Lower Harbor Brook would be coordinated with remedial activities in the Outboard Area.

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 policy[4] and NYSDEC's Division of Environmental Remediation Program Policy *Green Remediation* (DER-31)[5]. This will include consideration of green remediation technologies and practices.

Basis for the Preferred Response Action

This response action is not only less costly than Response Action 2, but it would be the most effective action in meeting the IRM objectives, as its implementation would contain the entire NAPL-impacted area.

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:

O'Brien & Gere. April 2010. *Engineering Evaluation/Cost Analysis (EE/CA), Harbor Brook Interim Remedial Measure.* O'Brien & Gere Engineers, Inc., Syracuse, New York.

[4] See http://epa.gov/region2/superfund/green_remediation

[5] See http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf

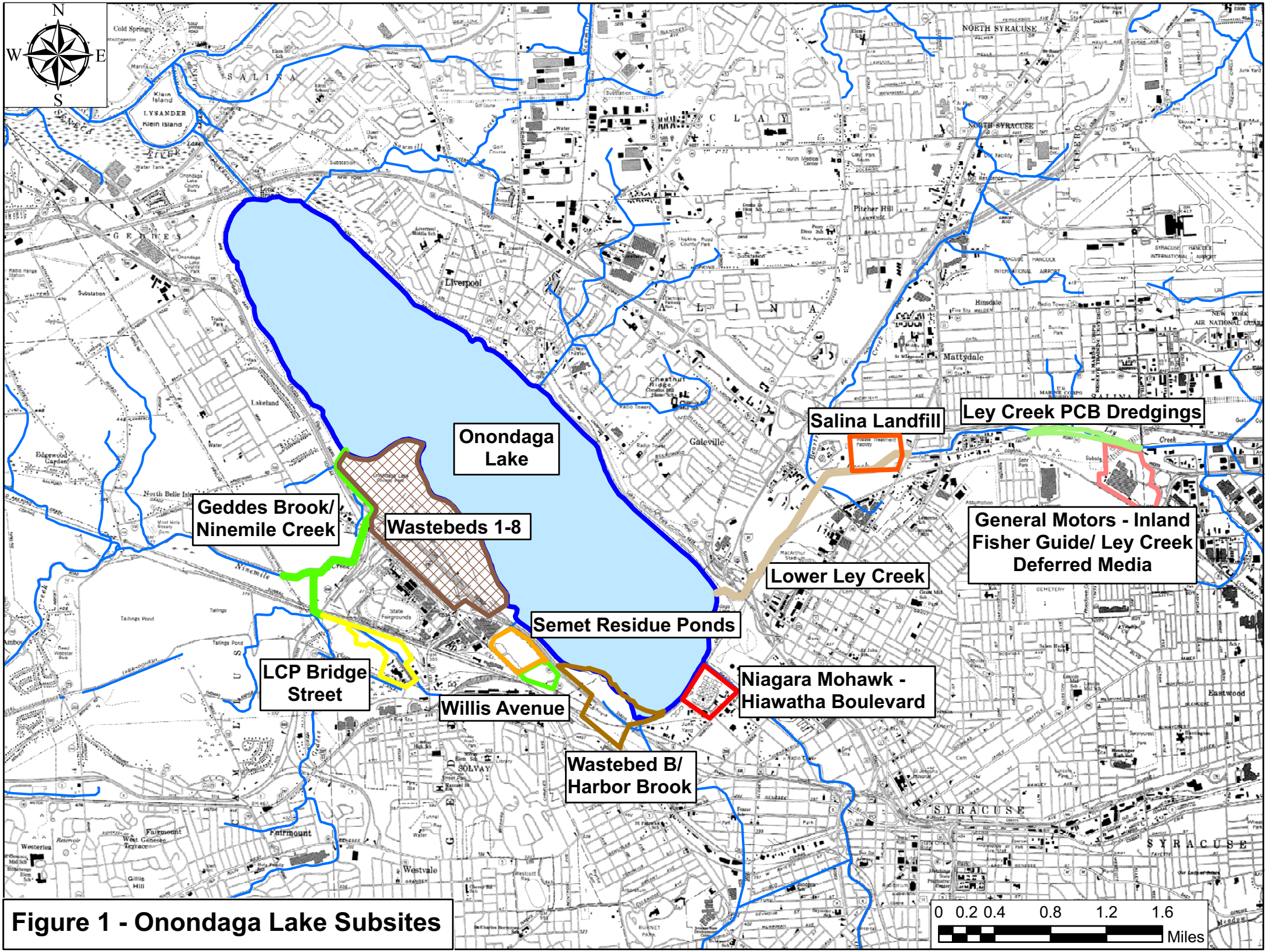

Figure 1 - Onondaga Lake Subsites

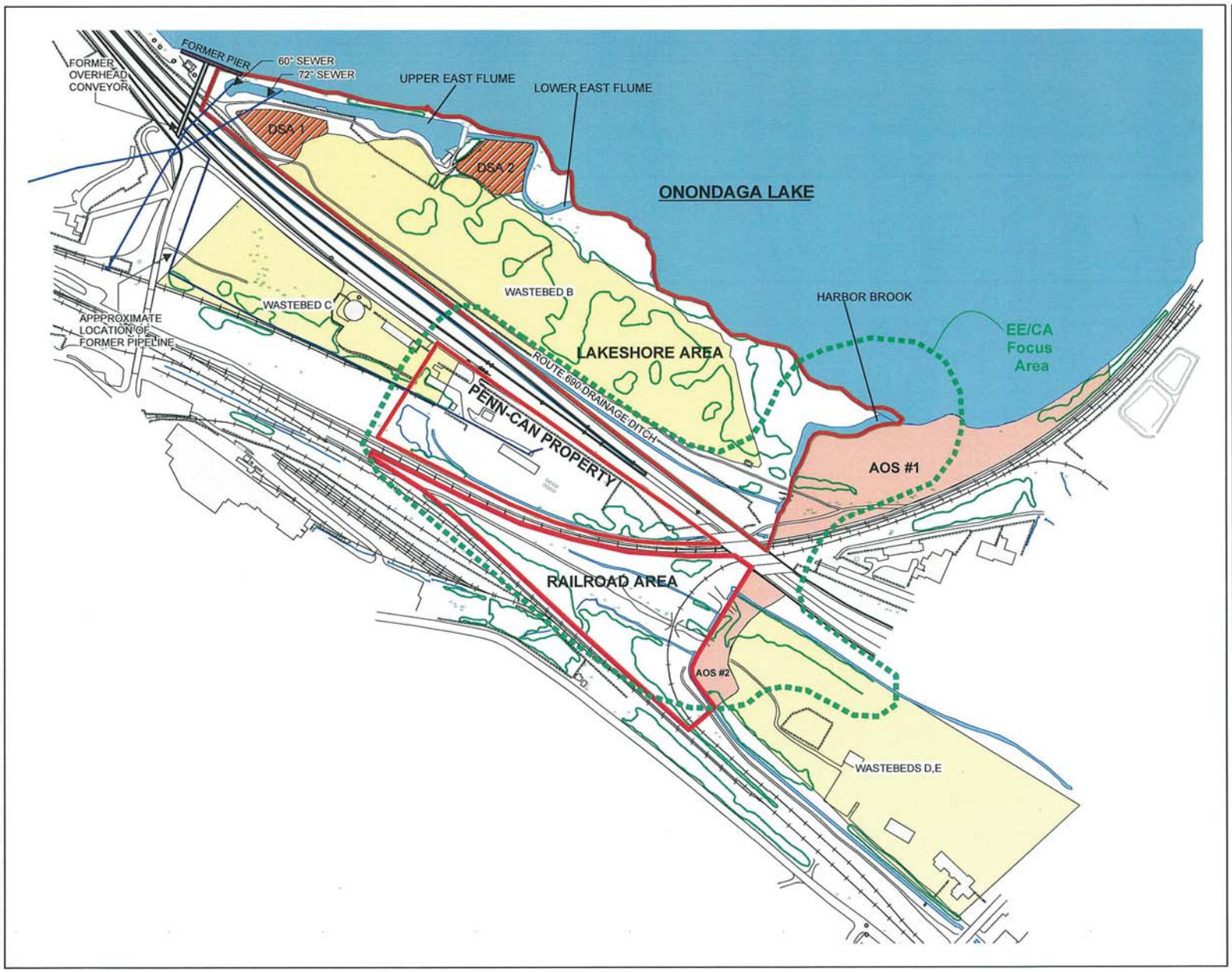

FIGURE 2

LEGEND

- HARBOR BROOK SITE
- DREDGE SPOIL AREA
- ADDITIONAL AREA OF STUDY
- WASTEBEDS

HONEYWELL
WASTEBED B/
HARBOR BROOK SITE
GEDDES AND SYRACUSE, NY

SITE LOCATION

N
W E
S

0 225 450 900
Feet

Note: Original base map information obtained from O'Brien & Gere Remedial Investigation Report (November 2007), Figure 2.

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

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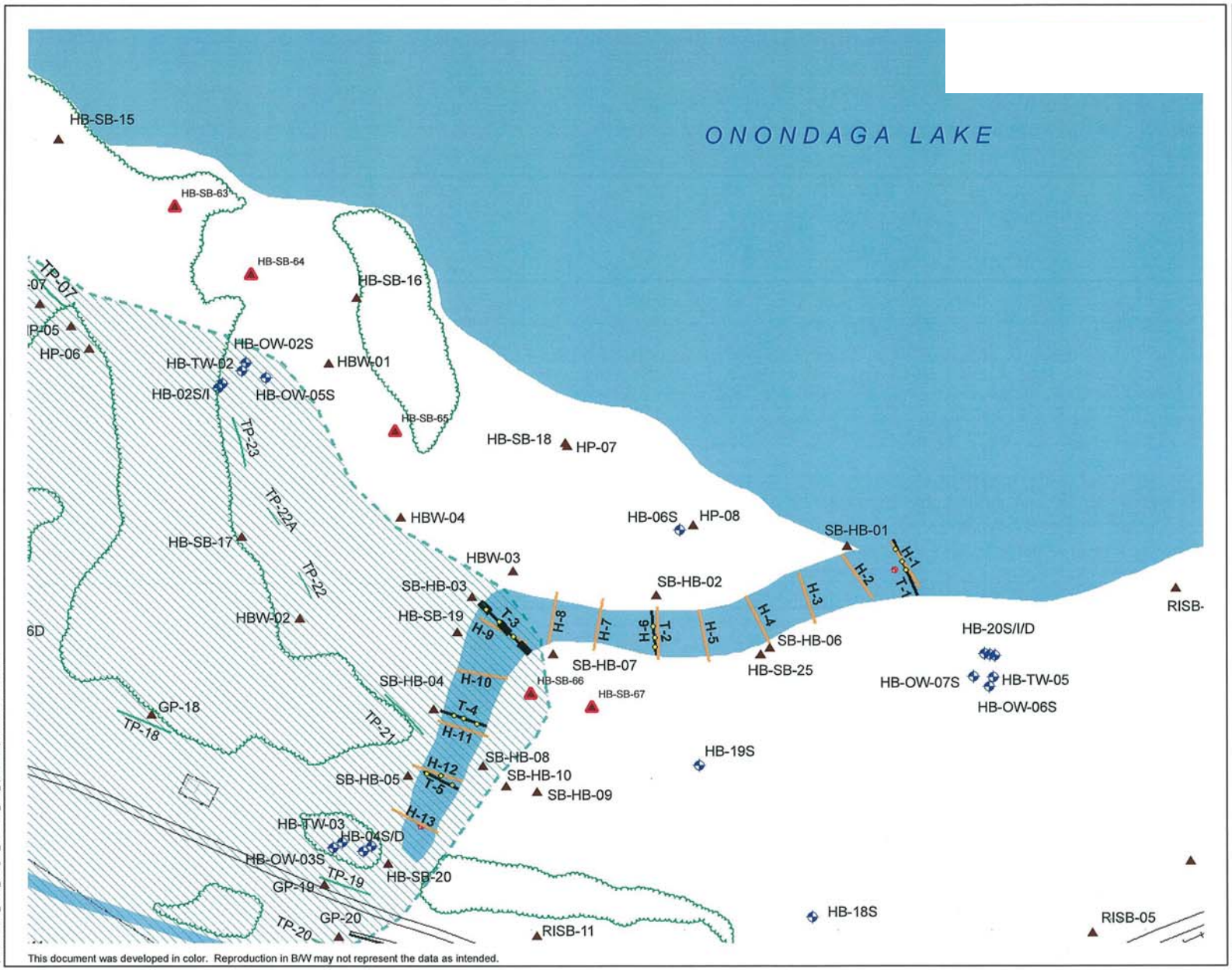
FIGURE 3



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LEGEND

- MONITORING WELLS
- SOIL BORINGS
- RI 2006 Soil Borings (GPS)
- TEST PITS
- SEDIMENT IRM INVESTIGATION SEDIMENT PROBING TRANSECT
- SEDIMENT IRM INVESTIGATION SAMPLING TRANSECT
- SEDIMENT IRM INVESTIGATION SEDIMENT CORE
- APPROXIMATE EXTENT OF NAPL IN MARL

HONEYWELL
WASTEBED B/
HARBOR BROOK SITE
GEDDES AND SYRACUSE, NY

DISTRIBUTION OF NAPL

N
W E
S

0 25 50 100 150 200
Feet

Note: Original base map information obtained from O'Brien & Gere Remedial Investigation Report (November 2007), Figure 107.

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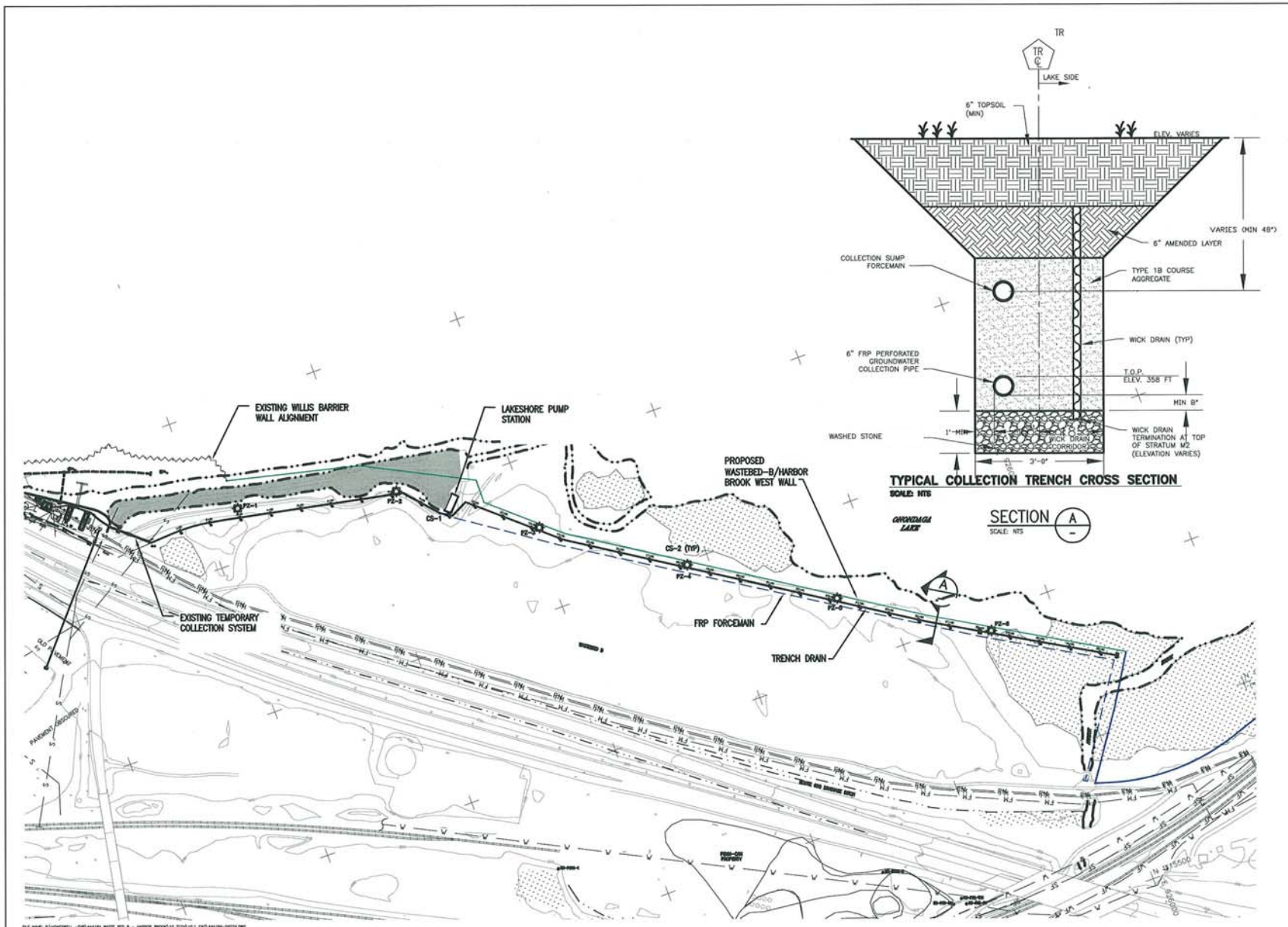
290 Elwood Davis Road, Suite 312, Liverpool, NY 13088 315-451-9560

FIGURE 4



LEGEND:

- BORING LOCATIONS
- WETLANDS
- WASTEBED B AREA
- WEST WALL ALIGNMENT
- PROPOSED EAST WALL ALIGNMENT

HONEYWELL INTERNATIONAL, INC.

WASTEBED B/ HARBOR BROOK IRM TOWN OF GEDDES, SYRACUSE, NY

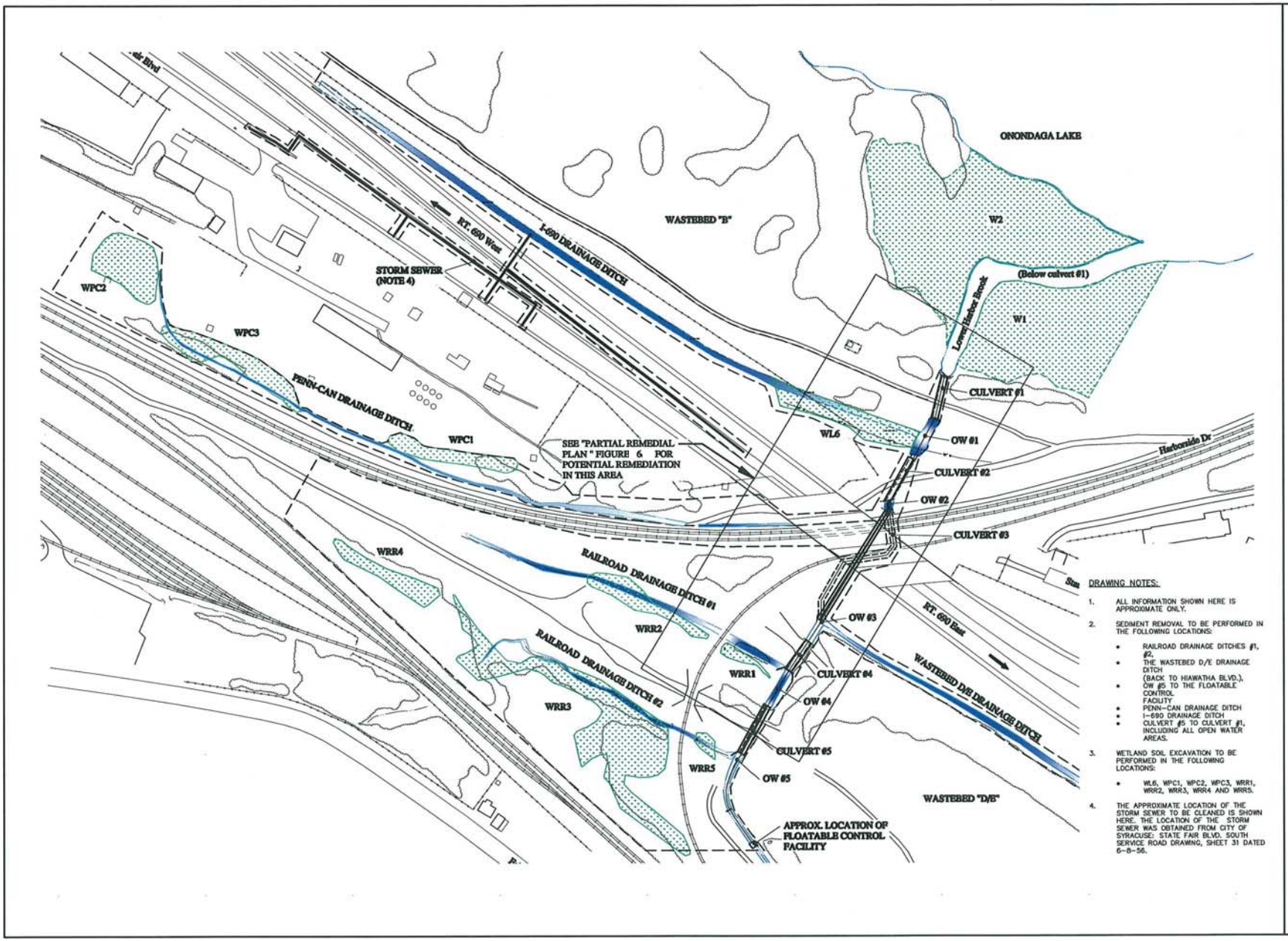
WEST WALL/ COLLECTION TRENCH

1"=300' 300 0 300

PARSONS

301 PLAINFIELD ROAD, SUITE 300, SYRACUSE, N.Y. 13212 315-451-9560

FIGURE 5



LEGEND:

- TREE LINE
- FENCE
- RAILROAD
- OW #5 OPEN WATER
- OPEN WATER/ DRAINAGE DITCH
- WRR3 DELINEATED WETLAND
- LIMITS OF WORK

DRAWING NOTES:

1. ALL INFORMATION SHOWN HERE IS APPROXIMATE ONLY.
2. SEDIMENT REMOVAL TO BE PERFORMED IN THE FOLLOWING LOCATIONS:
   - RAILROAD DRAINAGE DITCHES #1, #2.
   - THE WASTEBED D/E DRAINAGE DITCH (BACK TO HIAWATHA BLVD.).
   - OW #5 TO THE FLOATABLE CONTROL FACILITY
   - PENN-CAN DRAINAGE DITCH
   - I-690 DRAINAGE DITCH
   - CULVERT #5 TO CULVERT #1, INCLUDING ALL OPEN WATER AREAS.
3. WETLAND SOIL EXCAVATION TO BE PERFORMED IN THE FOLLOWING LOCATIONS:
   - WL6, WPC1, WPC2, WPC3, WRR1, WRR2, WRR3, WRR4 AND WRR5.
4. THE APPROXIMATE LOCATION OF THE STORM SEWER TO BE CLEANED IS SHOWN HERE. THE LOCATION OF THE STORM SEWER WAS OBTAINED FROM CITY OF SYRACUSE: STATE FAIR BLVD. SOUTH SERVICE ROAD DRAWING, SHEET 31 DATED 6-8-56.

HONEYWELL INTERNATIONAL, INC.

WASTEBED B/ HARBOR BROOK IRM TOWN OF GEDDES, SYRACUSE, NY

SITE PLAN

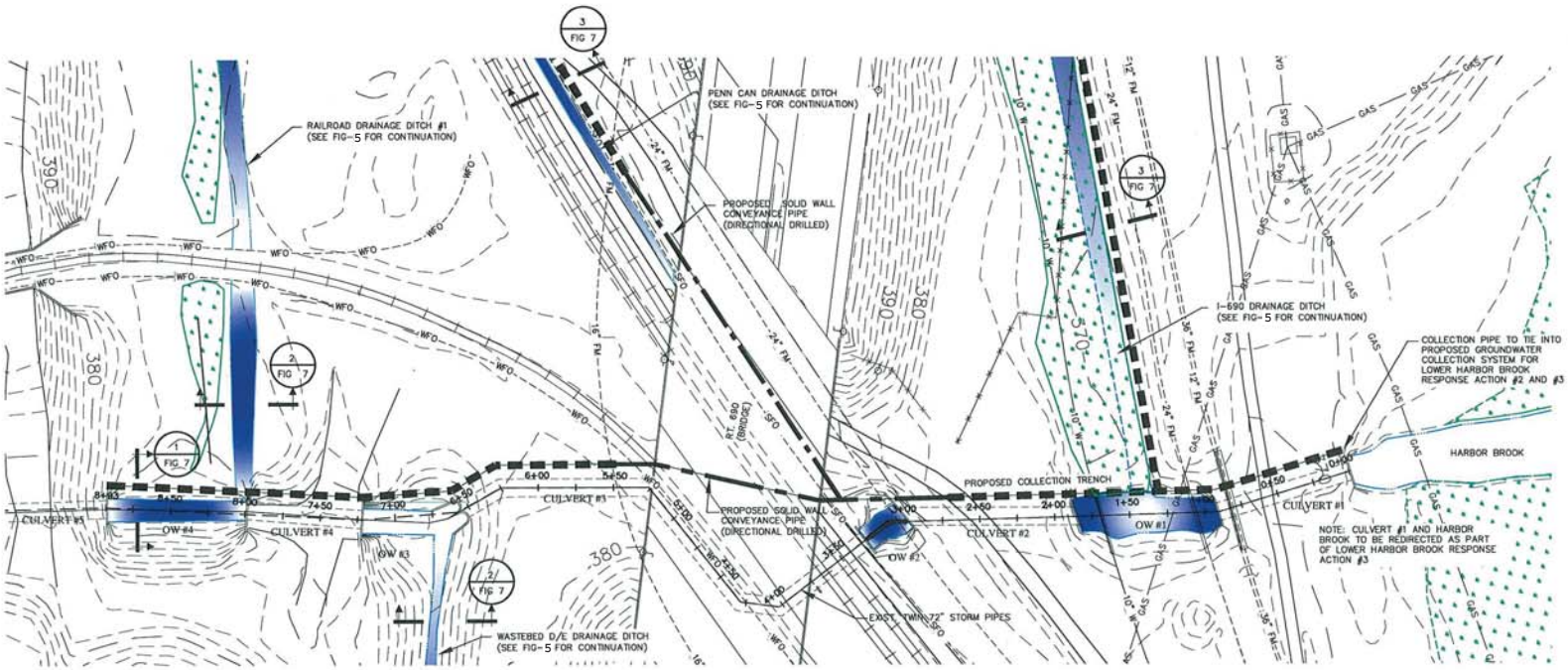
1"=200' 200 0 200

FILE NO. 1163.35685.032
DECEMBER 2009

O'BRIEN & GERE

I:\HONEYWELL.1163\35685.WB-B-HARBOR-BRK\DWG\FIGURES\35685-032-FIG2-2.DWG

FIGURE 6



PARTIAL REMEDIAL PLAN
SCALE: 1"=40'

LEGEND

- PROPOSED COLLECTION TRENCH
- PROPOSED SOLID WALL CONVEYANCE PIPE
- EXISTING TWIN 72" STORM PIPES
- ELEVATION CONTOUR
- TREE LINE
- FENCE
- GAS — GAS (SUN PIPELINE)
- RAILROAD
- WFO — WILLIAMS FIBER-OPTIC CABLE
- SFO — SPRINT FIBER-OPTIC CABLE
- FM — OCWA WATER MAIN
- OW #5 — OPEN WATER DRAINAGE SWALE
- OPEN WATER/ DRAINAGE DITCH
- DELINEATED WETLAND

HONEYWELL INTERNATIONAL, INC.

WASTEBED B/ HARBOR BROOK IRM
TOWN OF GEDDES, SYRACUSE, NY

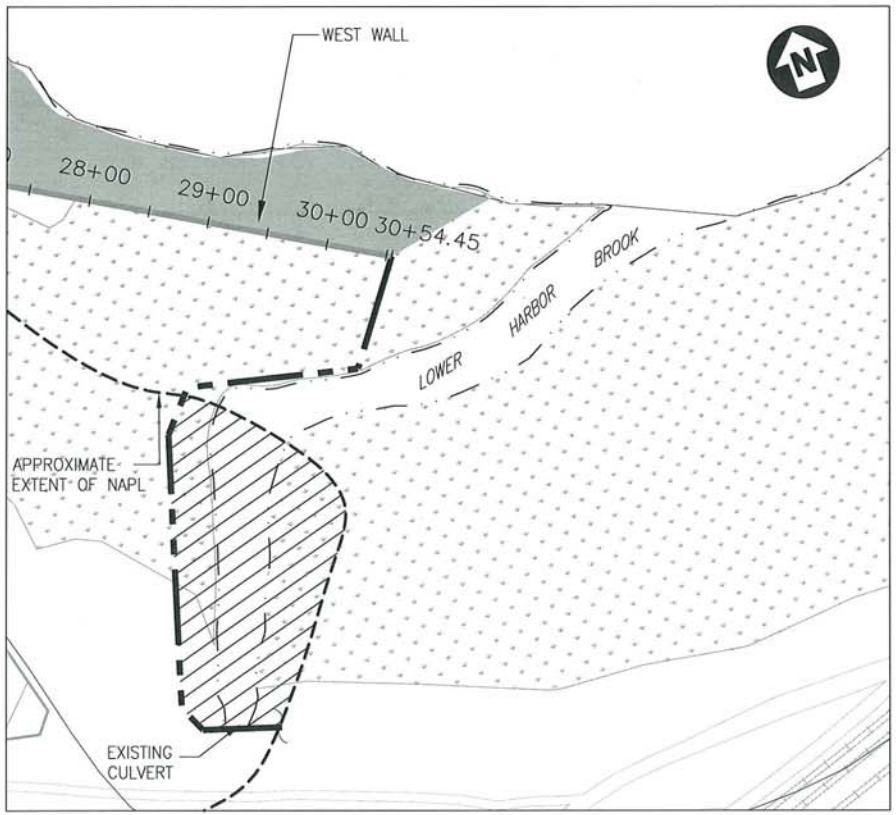
UPPER HARBOR BROOK PORTION OF IRM

PARTIAL REMEDIAL PLAN

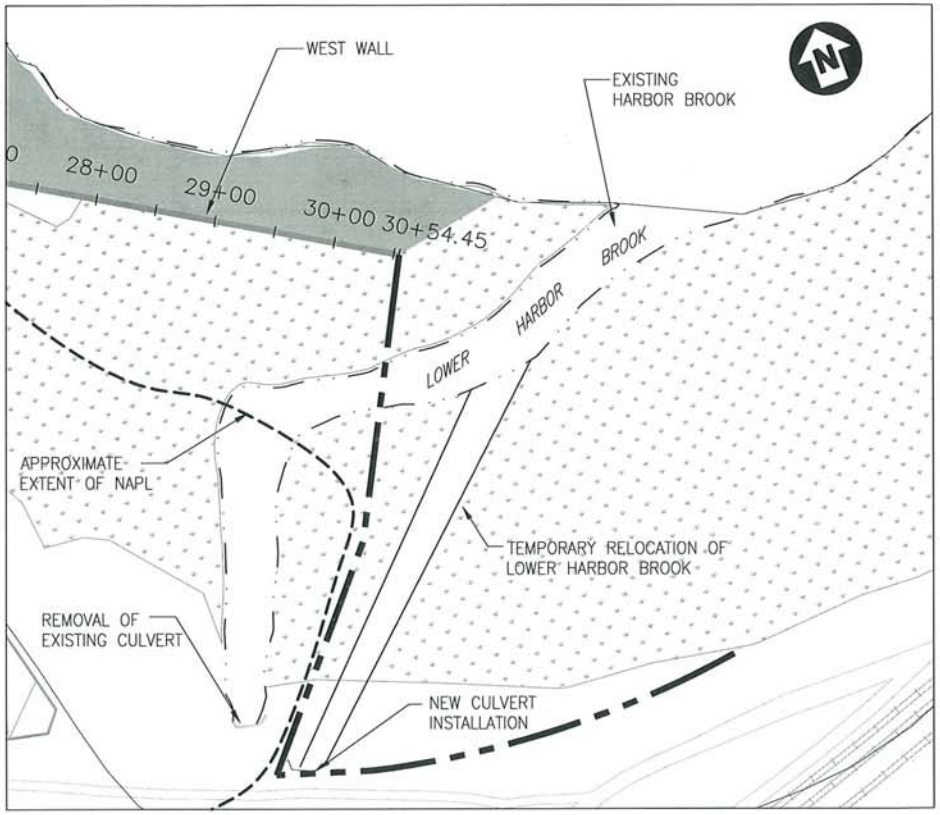
1"=80' 80 0 80

FILE NO. 1163.35685.034
SEPTEMBER 2009

O'BRIEN & GERE



PROPOSED EAST WALL ALIGNMENT
RESPONSE ACTION 2



PROPOSED EAST WALL ALIGNMENT
RESPONSE ACTION 3

LEGEND

- PROPOSED EXCAVATION AREA (WETLAND AREA TO BE RESTORED)
- EXISTING WETLAND AREAS
- PROPOSED EAST WALL
- PROPOSED WEST WALL
- APPROXIMATE EXTENT OF NAPL

100 50 0 100 200

SCALE: 1"=100'

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Preliminary Draft – Settlement Confidential For Discussion Purposes Only

FIGURE 7

Honeywell WASTEBED B/HARBOR BROOK SITE

PROPOSED EAST WALL ALIGNMENTS

PARSONS
301 PLAINFIELD ROAD, SUITE 350, SYRACUSE, N.Y. 13212 PHONE: 315-451-9560