Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Semet Residue Ponds Site
Sub-Site to the Onondaga Lake NPL Site
Town of Geddes, Onondaga County
Site Number 7-34-008

March 2002

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

RECORD OF DECISION

Semet Residue Ponds Site
Sub-Site of the Onondaga Lake Superfund Site
Town of Geddes, Onondaga County, New York

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

March 2002

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Semet Residue Ponds Site, Sub-Site of the Onondaga Lake Superfund Site, Town of Geddes, Onondaga County, New York

Superfund Site Identification Number: NYD095586376
EPA Operable Unit 6

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the New York State Department of Environmental Conservation's and the United States Environmental Protection Agency's (EPA's) selection of a remedy for the Semet Residue Ponds Sub-Site (the "Site"), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §9601 *et seq*., and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300; and the New York State Environmental Conservation Law (ECL) and 6 NYCRR Part 375. This decision document explains the factual and legal basis for selecting the remedy for the Site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the selection of the remedy is based.

The New York State Department of Health (NYSDOH) was consulted on the planned remedy and concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

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

DESCRIPTION OF THE SELECTED REMEDY

The source control response action described in this document addresses principal threat waste materials in the Semet Ponds and the highly- contaminated groundwater associated with these materials. In particular, the pond residue will be removed for recycling and the contaminated groundwater will be contained to prevent its migration into Tributary 5A and Onondaga Lake. Subsequent decision documents will address

residual organics in the ponds and potential restoration of site groundwater to applicable state and federal standards.

The major components of the selected remedy include the following:

- Excavation and reuse of the material present in the ponds. Specifically, the material will be excavated and processed on-Site, primarily for use in the production of a soft tar product (RT-12), which will be used to make driveway sealer at an off-Site location;

- Seeps of pond residue material that exist at and in the vicinity of the Site including, but not limited to, areas to the north of the Site adjacent to the Semet Residue Ponds and south of the Site adjacent to the railroad tracks (*i.e.*, south of the containment areas) will be covered (*e.g.*, with plastic and crushed stone) until the materials are remediated to prevent human or wildlife exposure. The seep materials will be processed to produce RT-12 if this is found to be feasible. Otherwise, the materials will be addressed under the separate operable unit described below;

- Installation of a stone-filled shallow groundwater collection trench to prevent groundwater discharges to Tributary 5A and a watertight sheet pile wall, collection trench, and groundwater extraction wells to prevent groundwater discharges to Onondaga Lake, located north of the Site;

- Installation of a treatment facility at the Site to process wastewater and groundwater collected from the RT-12 processing plant and the groundwater collection system, respectively;

- Maintenance of the existing temporary covers and fencing to limit human and wildlife exposures to contaminated soils and residues while the Semet Pond residue is being excavated and processed;

- Implementation of institutional controls (*i.e.*, deed restrictions) to restrict on-Site groundwater use;

- Implementation of institutional controls to prevent human exposure to contaminated soils and residues until the pond residue components of the selected remedy are completed, as well as remedial actions associated with the operable unit described below; and
- Long-term monitoring of the groundwater.

During the remedial design, additional investigations will be performed to identify and evaluate seeps of Semet residue. In addition, investigations may be performed to evaluate the integrity of the berms surrounding the ponds.

The Remedial Design/Remedial Action Work Plan for the implementation of the remedial action shall contain schedules for the processing of all Semet residue materials within the 12 year period, as well as milestones by which to gauge whether the project is on schedule for completion within this 12 year period. If there are any substantial delays in the implementation of the remedy, NYSDEC and EPA may take, or require responsible parties to take, further remedial actions necessary to protect human health or the environment.

Contaminated material located below and in proximity of the ponds, and in the Brushy Cleared Area which exceed Site cleanup goals for pond residue-related contaminants will be addressed under a separate operable unit. The remedial investigation/feasibility study (RI/FS) for the second operable unit (residual materials) will commence as soon as possible but no later than the point at which the Semet tar pond materials in the first of the five ponds have been withdrawn for processing. Any remedy that is selected to address the residual materials that cannot be so processed will be implemented in a phased manner, e.g., the remedy for the first pond that has been emptied will be implemented while the residues in the second pond are being processed, etc.

Under the selected groundwater remedy, all groundwater exceeding groundwater quality standards upgradient of the collection wells or collection trench will be contained. However, NYSDEC and EPA have determined that, at present, no decision can be made as to whether or not groundwater quality standards can be achieved, and that since the groundwater plume at the Semet Residue Pond Site is affected by and commingled with the groundwater contamination emanating from the adjacent Willis Avenue Site, a decision as to whether or not groundwater quality standards can be achieved cannot be made until a plan for remedial action is developed for the Willis Avenue Site.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. §9621, in that it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains the legally applicable or relevant and appropriate requirements under applicable federal and state laws or justifies grounds for their waiver; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In keeping with the statutory preference for treatment that reduces toxicity,

mobility, or volume of contaminated media, as a principal element of the remedy, the contaminated groundwater will be collected and treated. In addition, the excavated principal threat waste (the Semet residue) will be treated on-Site to produce a reusable product.

Because this remedy will result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- Chemicals of concern and their respective concentrations (see ROD, pages 5-8);
- Baseline risk presented by the chemicals of concern (see ROD, pages 9-12);
- Cleanup levels established for chemicals of concern and the basis for these levels (see ROD, pages 5-6);
- How source materials constituting principal threats are addressed (see ROD, page 8);
- Current and reasonably-anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD (see ROD, page 9);
- Potential land and groundwater use that will be available at the Site as a result of the selected remedy (see ROD, pages 35-36);
- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD, page 35); and
- Key factors that led to selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) (see ROD, pages 32-33).

AUTHORIZING SIGNATURES

Michael J. O'Toole, Jr. Division Director NYSDEC	Date
Jane M. Kenny Regional Administrator EPA, Region 2	Date

RECORD OF DECISION FACT SHEET

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

Site

Site name:	Semet Residue Ponds Site
Site location:	Town of Geddes, Onondaga County, New York
Listed on the NPL:	December 16, 1994

Record of Decision

Date signed:	March 28, 2002
Selected remedy:	Reuse of the Semet residue material (for use in the production of RT-12) and Hydraulic Containment Using a Groundwater Barrier, Extraction, and Collection Trench for Contaminated Groundwater Migrating Toward Onondaga Lake, Groundwater Collection Trench for Contaminated Groundwater Migrating Toward Tributary 5A, and On-Site Groundwater Treatment.
Capital cost:	$25,154,000
Annual O&M (for the Semet material remedy):	$3,101,500, annually (7% discount rate for 12 years)
Annual O&M (for the groundwater remedy):	$1,358,600, annually (7% discount rate for 30 years)
Present-worth cost:	$46.55 to $56.55 Million
Lead	NYSDEC
Primary Contact:	Tracy Alan Smith, Remedial Project Manager, (518) 402-9767
Secondary Contact:	Donald Hesler, Section Chief, (518) 402-9767
Main PRPs	Honeywell International, Inc. - NY

Waste

Waste type:	Volatile organic compounds and semi-volatile organic compounds
Waste origin:	Disposal of wastes generated by the acid washing of coke light oil during the production of benzene, toluene, naphthalene, and xylene at a BTX (Benzol) Plant
Contaminated media:	Groundwater, soil, surface water, and sediments

DECISION SUMMARY

Semet Residue Ponds Site
Sub-Site of the Onondaga Lake Superfund Site
Town of Geddes, Onondaga County, New York

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

March 2002

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SITE NAME, LOCATION, AND DESCRIPTION

In 1994, Onondaga Lake, its tributaries and the upland hazardous substance sites which were found to be releasing or threatening to release contamination to the Lake was added to the EPA's Superfund National Priorities List (NPL). The Semet Residue Ponds Site[1] is contributing such contamination and, therefore, is considered a "Sub-Site" of the Onondaga Lake NPL site.

The Semet Residue Ponds Site (approximately 40 acres), located in the Village of Solvay (Town of Geddes), Onondaga County, New York, is situated in an industrial area approximately 400 feet from the southern shore of Onondaga Lake (see Figure 1). The Site is bordered on the west and south by Crucible Materials Corporation, on the south by railroad tracks and an industrial complex, on the north by Interstate Route 690, and on the east by the former Willis Avenue Facility. The Site also includes a 12-acre brushy cleared area (hereinafter, "Brushy Cleared Area") (see Figure 2).

The Site, which is enclosed by a 6-foot high fence that was installed in 1979 to limit access, includes a triangular-shaped area that has five irregularly-shaped ponds used from 1917 to 1970 as depositories for waste material and two small areas bordering the southern and western portions of the Site that were built to contain leakage from the ponds (*i.e.*, containment areas). The Semet Residue Ponds cover approximately 11 acres, have an estimated average depth of 20 feet (estimated to range from 10 to 40 feet), and are estimated to contain approximately 80 million gallons of waste material, including a separate aqueous phase. Based on monitoring well data (*i.e.*, groundwater elevation levels and contaminant levels in groundwater), there is a plume of contaminated groundwater that originates at the Site and migrates toward Onondaga Lake and Tributary 5A.

Tributary 5A (see Figure 2) is a small drainage way which flows south of the Site near the CSX railroad tracks, then flows north to Onondaga Lake on the western side of the Site. Tributary 5A is being evaluated as part of the RI/FS for the former Willis Avenue Facility, which is also a Sub-Site of the Onondaga Lake NPL site. Impacts within Onondaga Lake from the Semet Residue Ponds will be addressed in the ongoing Onondaga Lake Bottom RI/FS.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

From 1917 to 1970, the Semet-Solvay Division of Allied Chemical & Dye Company (predecessor to Honeywell International, Inc.) operated the Semet Residue Ponds as depositories for a tarry organic-based residue generated by the acid washing of coke light

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[1] Superfund Site Identification Number: NYD095586376.

oil during the production of benzene, toluene, naphthalene, xylene, and “motor benzol” at its BTX (Benzol) Plant located immediately south of the above-noted railroad tracks. Prior to that time, the area was used as a settling basin for Honeywell’s disposal of Solvay Waste, a grayish-white colored material consisting largely of calcium carbonate that was a waste by-product from the production of soda ash (the Solvay Waste is not a hazardous waste and is not being addressed by this ROD). This settling basin is known as Solvay Waste Bed A.

The ponds were constructed via drag line and bulldozer excavation into Waste Bed A. The dikes bordering the ponds were reportedly built from fill materials including concrete rubble, old electrolytic cell parts, ashes, cinders, soil, Solvay Waste, bricks, stone, etc. Two small containment areas to the south and west of the Site were built to contain leakage from the ponds.

In addition to the Solvay Waste material, the area received coarse ash and cinders via conveyer buckets from stoker-fired boilers at Honeywell’s nearby Syracuse Works. A calcium carbonate-rich waste material, which originated from a former ammonium chloride operation, was also disposed of adjacent to Pond 2 prior to 1951. The surfaces of the ponds are approximately four inches thick and appear as a weathered black to brown granular material. Below the granular material is a highly viscous, black material which resembles tar.

A Consent Order for an RI/FS for the Site was signed by Honeywell and NYSDEC in 1989. Field work for the RI has been completed. Draft RI Reports were submitted in 1991 and 1992 and were reviewed by NYSDEC. The RI was approved by NYSDEC in August 1995. In June 1999, NYSDEC received the draft FS Report from Honeywell. Addendums to the FS report and additional Site-related submittals that are included in the Administrative Record were received on January 3, 2000; July 26, 2000; August 1, 2000; and August 17, 2001.

As an Interim Remedial Measure (IRM), a fly-ash/cement cover (a few inches thick) was applied to the pond residues to control odors and reduce air emissions. This cover was applied over Ponds 3 and 4 in 1995 and over the remaining ponds in mid-1997 (with the exception of one of the “containment” ponds in the southern portion of the Site that was inaccessible to the equipment used to apply the covers). Since that time, this cover material has been applied annually. While this cover has no significant strength or weight-bearing capacity, it has been effective in reducing odors.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, FS report, and Proposed Plan for the Site were made available to the public in both the Administrative Record and information repositories maintained at NYSDEC Albany and Syracuse offices, the information repository at the Onondaga County Public Library, Syracuse Branch at the Galleries, 447 South Salina Street, Syracuse New York,

and the information repository at the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. A notice of availability of the above-referenced documents was published in the *Post Standard* on January 19, 2002. The public comment period was held from January 19, 2002 to February 18, 2002. However, in response to a request for an extension, the public comment period was extended until March 20, 2002.

On February 6, 2002, NYSDEC conducted a public meeting at the Geddes Town Hall to present the findings of the RI/FS and answer questions from the public about the Site and the remedial alternatives under consideration.

In response to an inquiry by NYSDEC regarding the Site's reasonably-anticipated future land use, William Perez, the Zoning Board Chairman for the Village of Solvay, indicated in a March 19, 2002 telephone conversation with Tracy Smith of NYSDEC, that the Village of Solvay had no plans to modify the current industrial zoning of the property. In addition, Mr. Perez confirmed that the public water supply used by the Village of Solvay was provided by Onondaga County, and that the Village had no plans to use the groundwater at the facility for a drinking water source.

Responses to the comments received at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF OPERABLE UNIT

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Section 300.5, 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 phase 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.

NYSDEC and EPA have currently organized the work for the Onondaga Lake NPL Site into eight Sub-Sites. These Sub-Sites are also considered to be operable units of the NPL Site by EPA.

NYSDEC has already selected a remedy for the Ley Creek Dredgings Sub-Site in a ROD concurred on by EPA on February 9, 1998. Construction of the remedy for the Ley Creek Dredgings Sub-Site (excavation of PCB-contaminated soils, on-site disposal under a cap, and off-site treatment/disposal) was completed in August 2001.

On September 29, 2000, a ROD, with EPA concurrence, was signed by New York State for the LCP Bridge Street Sub-Site. The selected remedy includes a combination of

excavation and on- and off-site treatment/disposal of contaminated soils and sediments, and the construction of a cap, slurry wall, and groundwater extraction and treatment system. New York State has negotiated a Consent Order with the PRP for the performance of the design and construction of the selected remedy. The Consent Order was signed on March 21, 2002. The remedial design is anticipated to be completed in late 2003.

RI/FSs are currently underway at the following Onondaga Lake NPL Sub-Sites: Willis Avenue; Maestri 2; GM Former Inland Fisher Guide; Town of Salina Landfill; and the Onondaga Lake Bottoms, which includes the Geddes Brook and Ninemile Creek RI/FS. These RI/FSs are expected to be complete within two to three years. In addition, Interim Remedial Measure (IRMs) have been, or are being, conducted at the Willis Avenue, LCP Bridge Street and GM Former Inland Fisher Guide Sub-Sites.

The primary objectives of this action are to control the sources of contamination at the Semet Residue Ponds Sub-Site, to minimize the migration of contaminants, and to minimize any potential future health and environmental impacts.

Contaminated material located below and in proximity of the ponds, and in the Brushy Cleared Area which exceed Site cleanup goals for pond residue-related contaminants will be addressed under a separate operable unit.

Under the selected groundwater remedy, all groundwater exceeding groundwater quality standards upgradient of the collection wells or collection trench will be contained. However, NYSDEC and EPA have determined that, at present, no decision can be made as to whether or not groundwater quality standards can be achieved, and that since the groundwater plume at the Semet Residue Ponds Site is affected by and commingled with the groundwater contamination emanating from the adjacent Willis Avenue Site, a decision as to whether or not groundwater quality standards can be achieved cannot be made until a plan for remedial action is developed for the Willis Avenue Site.

SUMMARY OF SITE CHARACTERISTICS

The purpose of the RI, conducted from 1989 to 1995, was to determine the nature and extent of the contamination at and emanating from the Site. The results of the RI are summarized below.

Groundwater

The depth to groundwater at the Site ranges from five to 15 feet below the ground surface. There are three hydrogeological units that underlie the Site: the shallow; intermediate; and deep hydrogeologic units. The shallow hydrogeologic unit consists of Solvay Waste and

the underlying marl[2]. Groundwater within this unit flows toward Onondaga Lake and Tributary 5A. The intermediate hydrogeologic unit consists of native silts and fine-grained sands. The deep hydrogeologic unit consists of basal sand. Groundwater within these two deeper hydrogeologic units flows toward Onondaga Lake. As previously noted, impacts within Onondaga Lake and Tributary 5A are being addressed in the Onondaga Lake Bottom RI/FS and Willis Avenue RI/FS, respectively.

Fifteen Site-related organic compounds[3] have been detected in the groundwater. The volatile organic compounds (VOCs) detected include benzene, which ranged from 1 microgram per liter (µg/L) to 55,000 µg/L; toluene, which ranged from 0.6 µg/L to 3,900 µg/L; xylene, which ranged from 0.6 µg/L to 330 µg/L; and 2-butanone, which had concentrations that ranged from 16 µg/L to 710 µg/L. The NYSDEC ambient water quality standards for Class GA groundwater for benzene, toluene, and xylene are 1.0 µg/L, 5.0 µg/L, and 5.0 µg/L, respectively. The NYSDEC ambient groundwater quality guidance value for 2-butanone is 50 µg/L. These compounds can be traced to the material deposited in the ponds or their breakdown products.

For semi-volatile organic compounds (SVOCs), the compounds detected include phenol, 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol at concentrations ranging from 2 µg/L to 10,000 µg/L; naphthalene at concentrations ranging from 3 µg/L to 1,100 µg/L; and isophorone at concentrations of 3 and 6 µg/L. The NYSDEC ambient water quality standards for Class GA groundwater for total phenolic compounds is 1.0 µg/L and the ambient water quality guidance values for naphthalene and isophorone are 10 µg/L and 50 µg/L, respectively.

Surface Water

Surface water samples were collected in Onondaga Lake and Tributary 5A during the RI. The samples contained benzene at concentrations ranging from 87 to 110 µg/L in Onondaga Lake and from 18 to 110 µg/L in Tributary 5A. These values exceed the NYSDEC ambient water quality standard of 10 µg/L for Human Consumption of Fish in Onondaga Lake's Class C waters. The reported groundwater benzene concentration of 55,000 µg/L exceeds the NYSDEC 1998 Water Quality Criterion (WQC) for fish propagation protection (210 µg/L). The reported toluene groundwater concentration of 3,900 µg/L exceeds the WQC of 100 µg/L. The reported naphthalene concentration of 1,100 exceeds the WQC of 13 µg/L. Impacts to surface water within Onondaga Lake and Tributary 5A are also being addressed in the Onondaga Lake Bottom RI/FS and Willis Avenue RI/FS, respectively.

Sediments

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[2] A calcareous lake deposit that typically contains shells.

[3] These are contaminants that are associated with the organic-based residue materials that were disposed of at the Site.

The benzene concentration in lake sediment of 16,000 µg/kg exceeds the NYSDEC Human Health Bioaccumulation sediment criteria of 18.0 µg/kg[4]. This benzene concentration also exceeds the Benthic Aquatic Life Acute and Chronic Toxicity sediment criteria of 3,090 µg/kg and 840 µg/kg, respectively[5]. Impacts to sediment within Onondaga Lake and Tributary 5A are also being addressed in the Onondaga Lake Bottom RI/FS and Willis Avenue RI/FS, respectively.

Surface and Subsurface Soil

The Semet Residue Ponds cover a portion of the Site. Solvay Waste is present at the surface in the remaining portion of the Site.

The boring logs for the monitoring wells installed in the Solvay Waste near the ponds generally found Solvay Waste extending down to about 45 feet with some ash and concrete debris being present near the surface. Solvay Waste encountered in the borings had an odor and photoionization detector (PID)[6] readings as high as 500 parts per million (ppm). Below the Solvay Waste (from approximately 45 to 90 feet), marl, silt, fine sand, and clay were encountered, with odors and PID readings generally decreasing as the depth increased. Gravel and weathered Vernon shale were encountered at a depth of approximately 90 feet.

Air Quality

Air samples were collected as part of the RI and analyzed for select VOCs and SVOCs. Samples were collected from upwind, on-Site, and downwind. Higher VOC concentrations were detected upwind of the Site. Benzene was detected upwind at 1.28 micrograms per cubic meter (µg/m^3) and downwind at 0.51 µg/m^3. Toluene was detected upwind at 0.82 µg/m^3 and downwind at 0.43 µg/m^3. Xylene was detected upwind at 0.38 µg/m^3 and downwind at 0.12 µg/m^3. The RI concluded that since downwind concentrations of the above-noted compounds are less than those upwind, the Site is not contributing to ambient air concentrations of these compounds.

As a result of odor complaints and sample results in 1995 and 1996 which documented air releases from the Site, a fly-ash/cement cover was applied to the ponds. Since that time, this cover material has been applied annually.

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4 The value is based on an approximate mean lake sediment organic carbon content of 3.0% and the NYSDEC (1999) sediment criteria for human health bioaccumulation of 0.6 $\mu g_{benzene}/g_{oc}$.

5 The value is based on an approximate mean lake sediment organic carbon content of 3.0% and the NYSDEC (1999) sediment criteria for benthic aquatic life acute and chronic toxicity of 103 $\mu g_{benzene}/g_{oc}$ and 28 $\mu g_{benzene}/g_{oc}$, respectively.

6 A field organic vapor monitoring device.

Waste Materials

The residues in the five ponds consist of an organic phase and an acid phase. The organic phase is composed of more than 100 organic compounds, primarily aromatic hydrocarbons, substituted aromatic hydrocarbons, alkanes, substituted alkanes, polyaromatic hydrocarbons, aldehydes, and ketones. Benzene, toluene, xylene, and naphthalene were found to comprise up to 10% of the organic phase of the pond residues. The pond residues' acid phase is highly acidic with a pH between 1 and 2.6. Based on 6 NYCRR Part 371, this phase has been determined to be a Resource Conservation and Recovery Act (RCRA) characteristic hazardous waste due to the high acid content and low pH (less than 2). Therefore, because of the significant toxicity posed by the high acid content and low pH, the residue in the five ponds is a principal threat.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the remedy selection criteria which are described below. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

The pond residue in the five Semet ponds is considered a "principal threat waste." Due to its acid content (pH of 1 to 2.6) it poses an acute hazard in that contact with it would result in burns to the skin which could have severe, and potentially fatal effects.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The property is presently zoned industrial. The current land use in the immediate vicinity of the Site is industrial. Based on a number of factors, including the reported history of land use in the area of the Site since the early 1900's, the existing zoning for the Site

property, and subsequent communications between NYSDEC and the Zoning Board Chairman for the Village of Solvay, NYSDEC determined that the reasonably-anticipated future use for the Site is industrial.

Currently, the on-Site aquifers are not used for drinking water. Residents located in the vicinity of the Site use the public water supply provided by Onondaga County. Groundwater near the Site will not be used as a source of potable water under future-use scenarios.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimates the human health and ecological risks which could result from the contamination at the Site, if no remedial actions were taken. As was noted above, the local zoning for the Site and land adjacent to the Site is industrial. Thus, it appears that the reasonably anticipated future use for the Site is industrial. Although it is anticipated that the future use of Site groundwater will not be a drinking water source, applicable federal Maximum Contaminant Levels (MCLs) and state groundwater standards are still cleanup goals for Site groundwater, since the groundwater is classified as “Class GA” fresh groundwater. In accordance with NYSDEC Water Quality Regulations (6 NYCRR Part 701.15), the best usage of “Class GA” waters is as a source of potable water supply.

Human Health Risk Assessment

A Superfund human health risk assessment estimates the “baseline risk.” This is an estimate of the likelihood of a heath problem occurring if no clean up actions were taken at a site. To estimate this baseline risk at a Superfund site, a four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: The hazard identification step identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence and concentration.

Exposure Assessment: Under this step, the different ways that people might be exposed to the contaminants identified in the previous step, the concentrations that people might be exposed to, and the potential frequency and duration of exposure are considered. Using this information, a “reasonable maximum exposure” scenario, which portrays the highest level of human exposure that could reasonably be expected to occur is calculated.

Toxicity Assessment: The toxicity assessment determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response).

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards.

Exposure pathways considered for the baseline risk assessment included: ingestion of groundwater; inhalation of air; ingestion of game which may visit the Site (food chain); and dermal contact with the pond residue. While groundwater is currently classified as Class GA (source of drinking water), the groundwater pathway was considered to be incomplete since no one is currently using groundwater as a drinking water source because the area is served by municipal water. The human food chain pathway was also considered to be incomplete because hunting is prohibited in the Town of Geddes. The air pathway is currently incomplete. However, if the temporary cap were to deteriorate or be removed, the air pathway might become complete, thereby posing a potential risk. Risks associated with the ingestion of fish within Onondaga Lake and with exposures to Onondaga Lake surface water and sediments were not addressed as part of the Semet Residue Ponds RI/FS. These exposures are being addressed in the Onondaga Lake Bottom RI/FS.

The primary exposure scenario which represents a potential risk involved trespassers who directly contact the pond residue. Direct contact with the pond residue was identified as a primary acute hazard which would result in burns to the skin which could have severe, and potentially fatal effects, due to its acid content (pH of 1 to 2.6). The likelihood of this exposure scenario has been somewhat reduced since a 6-foot chain-link fence limits access to the Site[7].

Ecological Risk Assessment

Due to its acid content, there exists a significant risk to wildlife should they come in contact with the pond residue. Based upon the use of forage plant uptake factors for benzene from the soil, the concentration of benzene present in the pond residue, and the consideration of a white-footed mouse as a receptor, it was determined that there is a potential ingestion risk to a terrestrial herbivore and higher species. It was also determined that there is a potential risk to vegetation present.

In addition, as with human exposure, wildlife coming in direct contact with the pond residue would suffer burns which could have severe, and potentially fatal effects.

Summary of Human Health and Ecological Risks

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[7] While HHRA's typically provide a quantitative assessment of site risks in terms of the potential risk of developing cancer and the potential for non-cancer health hazards from long-term exposure to Site-related contaminants, because of the acute hazard posed by the pond residue at this Site, long-term exposure to the residue is not possible. Therefore, calculation of cancer and non-cancer health hazards is not relevant.

It has been concluded that: (1) trespassers and wildlife could come into contact with the pond residue; (2) the groundwater exposure pathway was unlikely (because there are no current Site deep groundwater users, and the area is served by municipal water); (3) the air exposure pathway is not currently complete, but could become complete if the temporary cap were to deteriorate or be removed; (4) the food chain exposure pathway via ingestion of game animals is unlikely due to the prohibition of hunting in the Town of Geddes; and (5) there is a potential risk to vegetation and to terrestrial herbivores and higher species.

Onondaga Lake and Tributary 5A surface water samples contained benzene exceeding the NYSDEC ambient water quality standards for human consumption of fish in Onondaga Lake's Class C waters. The levels of benzene in the groundwater which discharges to Onondaga Lake also exceed the New York State Class C surface water quality standard for benzene. This standard is based on impacts to humans who consume fish. In addition, the levels of toluene and naphthalene exceed the State's Class C ambient water quality guidance values for these chemicals. The levels for toluene and naphthalene exceed both the chronic and acute toxicity criteria established for aquatic species in surface water. It should be noted that although the groundwater underlying this Site discharges to Onondaga Lake, and the Site has been documented to be a source of organic contamination to the Lake, the risk assessment did not address exposures that occur as a result of the discharge of this organic-contaminated groundwater to Onondaga Lake.

Based upon the human health and ecological risk assessments, and the fact that groundwater containing hazardous substances in excess of surface water standards discharge unabated into Onondaga Lake, NYSDEC has determined that the Site poses an unacceptable threat which warrants remediation.

Basis for Action

Based upon the human health and ecological risk assessments, NYSDEC has determined that the response action selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances from the Site into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as ARARs and risk-based levels established in the risk assessment.

The following remedial action objectives have been established:

- Prevent direct contact (human and wildlife) with the pond residue;

- Reduce volatile emissions from the pond residue; and

- Eliminate, to the extent practicable, migration of groundwater to Onondaga Lake and Tributary 5A that does not attain applicable state and federal water quality criteria for Site-related constituents.

SUMMARY OF ALTERNATIVES

CERCLA Section 121(b)(1), 42 U.S.C. §9621(b)(1) and 6 NYCRR Part 375, mandates that a remedial action must be protective of human health and the environment, be cost-effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. CERCLA Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under applicable federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report, addendums, and additional Site-related submittals that were submitted in 2000 and 2001. The FS report and related documents presents numerous remedial alternatives categorized by the media (Semet pond material and groundwater) they address. To facilitate the presentation and evaluation of these alternatives, the alternatives described in the FS report and related documents have been consolidated into the remedial alternatives discussed below. This Record of Decision evaluates, in detail, four remedial alternatives for the pond residue and three remedial alternatives for the Site-related contaminants in the groundwater, and selects an alternative for each.

The present-worth costs for the alternatives discussed below are calculated using a discount rate of 7 percent and a 30-year time interval. The time to implement reflects only the time required to construct and implement the remedy and does not include the time required to design the remedy, insure the performance of the remedy by Honeywell, or procure contracts for design and construction.

Components Common to all Action Alternatives:

Each combination of action alternatives assumes that a deed restriction would be placed on the facility to prevent human exposure to contaminated soils and residues and to prevent exposure to contaminated groundwater. The deed restriction would restrict the

use of approximately 40 acres of land. The capital cost and present-worth cost for implementing a deed restriction would be approximately $20,000.

Pond Residue Alternatives:

Alternative SEM-1: No Further Action

Capital Cost:	$0
Annual Monitoring Costs:	$1,000
Total Present-Worth Cost:	$12,400
Construction Time:	0 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no further action remedial alternative does not include any physical remedial measures that address the pond residue, nor does it include any maintenance to ensure that the temporary cover remains intact. However, this alternative would include maintenance of the fence that currently exists around the Site.

Because this alternative would result in contaminants remaining on-Site, CERCLA requires that the Site be reviewed at least once every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

Alternative SEM-2: Pond Residue Reuse

Capital Costs:	$14,530,000
Annual Operation & Maintenance Costs[8]:	$3,101,500
Total Present-Worth Cost[9]:	$19,164,000 - $29,164,000
Construction Time:	12 years

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8 This is the annual cost associated with processing the pond residue and is considered part of the implementation costs for the remedy.

9 The present-worth cost of Alternative SEM-2 has been adjusted based on an anticipated net income (pretax) range of $10,000,000 to $20,000,000 from the sale of the product.

Under this alternative, approximately 80 million gallons of pond residue would be excavated from the ponds, conveyed to an on-Site processing plant, and placed into a feed tank. It would then be fed into a water separator to produce a liquid acid phase and an organic phase. Following separation, the aqueous phase (wastewater) would be directed to an on-Site wastewater treatment facility where it would be treated using chemical, biological, and physical processes, such as pH adjustment, biological degradation, and air stripping. The treated aqueous phase would be discharged to Onondaga Lake or injected into a groundwater aquifer. The organic phase would be preheated and fed into a distillation system to separate the water, benzene, and light oil. The water would be fed into the wastewater treatment facility and the recovered benzene would be shipped off-Site for use by refineries or chemical plants as benzene feed stock. The recovered light oil would be shipped off-Site as refinery feed stock, a coal tar plant diluent, or fuel. This light oil could also be used on-Site as a fuel for heating purposes. The “dry” organic phase would be mixed with blend stock to produce a soft tar product (RT-12), which would be used to make driveway sealer at an off-Site location. The two containment areas would be relocated to within the existing ponds so they could be processed or treated along with the rest of the pond residue.

The soft tar product would be directed to one of two 30,000-gallon tanks, where it would be subjected to testing for quality control and checked against RT-12 specifications. If it does not meet specifications, the composition of the batch would be modified and retested. Once a batch meets the specifications, it would be pumped into a 420,000 gallon final product tank. From this tank, the final product would be pumped into either rail cars or tank trucks and transported to end users (manufacturers of driveway sealer).

The New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 (TAGM) would serve as the cleanup goal for the contaminated material located in the ponds.

Seeps of pond residue material that exist at and in the vicinity of the Site including, but not limited to, areas to the north of the Site adjacent to the Semet Residue Ponds and south of the Site adjacent to the railroad tracks (*i.e.*, south of the containment areas) would be covered (*e.g.*, with plastic and crushed stone) until the materials are remediated to prevent human or wildlife exposure. The seep materials would be processed to produce RT-12 if this is found to be feasible. Otherwise, the materials would be addressed under a separate operable unit which would be established to address the contaminated material located below and in proximity of the ponds and in the Brushy Cleared Area which exceed Site cleanup goals for pond residue-related contaminants. The RI/FS for the second operable unit (residual materials) would commence as soon as possible but no later than the point at which the Semet tar pond materials in the first of the five ponds have been withdrawn for processing. Any remedy that is selected to address the residual materials that cannot be so processed would be implemented in a phased manner, e.g., the remedy for the first pond that has been emptied would be implemented while the residues in the second pond are being processed, etc.

To limit human and wildlife exposure to contaminated soils and residues, this alternative also includes maintenance of the temporary covers and fencing while the pond residue is being processed. Until the remedy was completed, institutional controls (*i.e.*, deed restrictions) would be implemented to prevent human exposure to contaminated soils and residues. Following the completion of the processing, specific institutional control requirements would need to be determined as part of the remedy for the separate operable unit that would address residual contaminated material below the Semet residue ponds, as well as the Brushy Cleared Area.

Because this alternative would result in contaminants remaining on-Site, CERCLA requires that the Site be reviewed at least once every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

Alternative SEM-3: Containment

Capital Costs:	$15,310,000
Annual Operation & Maintenance Costs:	$264,280
Total Present-Worth Costs:	$18,590,000
Construction Time:	2 years

Under this alternative, the pond residue would be contained with a floating cover or other load distributing technologies (since the pond residue is highly corrosive and has negligible weight-bearing capacity, conventional composite covers for the ponds are not viable). It is anticipated that a functional cover with the following elements, aimed at maximizing load distribution, would be utilized:

- A floating cover system consisting of individual casings, made of polystyrene foam blocks encapsulated in high density polyethylene (HDPE) flexible membrane (lower component)

- An active gas collection system consisting of perforated HDPE pipes (middle component)

- An ultraviolet light-resistant flexible membrane final cover (upper component)

The TAGM would serve as the cleanup goal for the Site. Materials in proximity of the ponds which exceed cleanup goals for pond residue-related contaminants would be covered with a New York State 6 NYCRR Part 360 or equivalent cap(s) (consolidation of some of the contaminated areas might be necessary). The extent of material that would

need to be addressed would be further determined during remedial design activities. This alternative also includes access restrictions, such as deed restrictions and fencing.

Seeps of pond residue would be permanently addressed by such measures as covering or excavating.

Under this alternative, institutional controls would be implemented to protect the integrity of the constructed remedial measures, control future development/excavation activities, and prohibit the Site from being used for purposes other than appropriate industrial or commercial enterprises, as explained below, without the express written waiver of such prohibition by NYSDEC and NYSDOH. Appropriate industrial or commercial uses of the property would have to be consistent with the applicable zoning requirements, but would not include enterprises that would draw susceptible portions of the community to the property for activities that may lead to exposures to residual Site contamination (*e.g.*, day care, child care, medical treatment facilities, some recreational enterprises). The property owner would need to develop a post-remedy Soils Management Plan to address the handling of potentially contaminated soils generated by future development of the Site. The property owner would also need to certify annually to NYSDEC that these institutional controls are in place, and in force, and that long-term monitoring is being conducted as required by the remedy.

Because this alternative would result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

Alternative SEM-4: Incineration

Capital Costs:	$46,557,000
Annual Operation & Maintenance Costs:	$0
Total Present-Worth Costs:	$46,557,000
Construction Time:	5 years

Under this alternative, approximately 80 million gallons of pond residue, as well as materials below and in the proximity of the ponds which exceed cleanup goals for pond residue-related contaminants, would be excavated and incinerated on-Site. The TAGM would serve as the cleanup goal for the Site. The extent of material that would need to be remediated would be further determined during remedial design activities. During excavation, part of the aqueous phase would likely be separated. It would be directed to an on-Site wastewater treatment facility where it would be treated using chemical,

biological, and physical processes, such as pH adjustment, biological degradation, and air stripping and discharged to Onondaga Lake or injected into a groundwater aquifer.

All of the excavated material would be preconditioned to increase the pH and then fed into an on-Site incinerator. The incinerator might require off-gas treatment. Ash generated from the incinerator would be tested in accordance with the Toxicity Characteristic Leaching Procedure (TCLP) to determine whether it constitutes a RCRA hazardous waste. If it passes the TCLP test, it would be disposed of on-Site. Ash above TCLP levels would either undergo additional treatment or be disposed of at an approved off-Site facility, as appropriate. The excavated areas would be backfilled with the ash (if non-hazardous) and/or clean fill, and the Site would be regraded, covered with topsoil, and seeded.

Seeps of pond residue material that exist at and in the vicinity of the Site including, but not limited to, areas to the north of the Site adjacent to the Semet Residue Ponds and south of the Site adjacent to the railroad tracks (*i.e.*, south of the containment areas) would be covered (*e.g.*, with plastic and crushed stone) until the materials are remediated to prevent human or wildlife exposure. The seep materials would be incinerated if this is found to be feasible. Otherwise, the materials would be addressed under a separate operable unit which would be established to address the contaminated material located below and in proximity of the ponds and in the Brushy Cleared Area which exceed Site cleanup goals for pond residue-related contaminants.

To limit human and wildlife exposure to contaminated soils and residues, this alternative also includes maintenance of the temporary covers and fencing while the pond residue is being processed. Until the remedy was completed, institutional controls (*i.e.*, deed restrictions) would be implemented to prevent human exposure to contaminated soils and residues. Following the completion of the processing, specific institutional control requirements would need to be determined as part of the remedy for the separate operable unit that would address residual contaminated material below the Semet residue ponds, as well as the Brushy Cleared Area.

Groundwater Remedial Alternatives:

Alternative GW-1: No Action and Long-Term Monitoring

Capital Costs:	$0
Annual Operation and Maintenance Costs:	$22,100
Total Present-Worth Cost:	$172,000
Construction Time:	1 months

The Superfund program requires that the "no-action" alternative be considered as a baseline for comparison with the other alternatives. The no-action remedial alternative does not include any physical remedial measures that address the groundwater contamination at the Site. This alternative would, however, include a long-term groundwater monitoring program. Under this monitoring program, groundwater samples would be collected and analyzed annually.

Because this alternative would result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by the review, remedial actions may be implemented to treat the groundwater.

Alternative GW-2: Groundwater Extraction for Contaminated Groundwater Migrating Toward Onondaga Lake, Groundwater Collection Trench for Contaminated Groundwater Migrating Toward Tributary 5A, and On-Site Groundwater Treatment

Capital Costs:	$5,951,000
Annual Operation & Maintenance Costs:	$1,426,000
Total Present-Worth Cost:	$22,282,000
Construction Time:	1 year

This alternative would address contaminated water migrating toward Tributary 5A using a 3,100-foot long and 10-foot deep stone-filled shallow groundwater collection trench. The trench would be constructed between the toe of the slope of the Semet Residue Ponds and Tributary 5A. A flexible membrane would be installed along the bottom and downgradient side of the entire length of the trench to separate the water in Tributary 5A from the groundwater being collected in the collection trench. A flexible membrane barrier layer would be installed over the collection trench to minimize the infiltration of surface water into the trench.

To address the contaminated groundwater migrating toward Onondaga Lake, approximately seven shallow/intermediate overburden and three deep overburden groundwater extraction wells would be installed on the Site between the ponds and State Fair Boulevard.

The contaminated groundwater collected from the trench and the extraction wells would be treated at a treatment plant constructed on-Site[10]. It is anticipated that the treatment system would consist of precipitation, neutralization, biological degradation, and filtration to remove inorganics, VOCs, and SVOCs. The treated water would be discharged to Onondaga Lake or injected into an aquifer.

Contaminated soil excavated from the groundwater collection trench would be disposed in accordance with applicable state and federal regulations.

As part of a long-term groundwater monitoring program, groundwater samples would be collected and analyzed semiannually in order to verify that the concentrations of groundwater contaminants are declining and that conditions are protective of human health and the environment.

Institutional controls, such as deed restrictions, would be implemented to prevent exposure to contaminated groundwater.

Because this alternative would result in contaminants remaining on-Site, CERCLA requires that the Site be reviewed at least once every five years.

Alternative GW-3: Hydraulic Containment Using a Groundwater Barrier, Extraction, and Collection Trench for Contaminated Groundwater Migrating Toward Onondaga Lake, Groundwater Collection Trench for Contaminated Groundwater Migrating Toward Tributary 5A, and On-Site Groundwater Treatment

Capital Costs:	$10,624,000
Annual Operation & Maintenance Costs:	$1,358,600
Total Present-Worth Cost:	$27,381,000
Construction Time:	1 year

This alternative would also address contaminated water migrating toward Tributary 5A using a 3,100-foot long and 10-foot deep stone-filled shallow groundwater collection trench. The trench would be constructed between the toe of the slope of the Semet Residue Ponds and Tributary 5A. A flexible membrane would be installed along the bottom and downgradient side of the entire length of the trench to separate the water in

[10] IRMs to reduce the migration of contaminated groundwater from the Willis Avenue and Wastebed B/Harbor Brook Sites to Onondaga Lake are currently being evaluated. The contaminated groundwater that is collected as part of these proposed IRMs would likely be treated by this treatment plant.

Tributary 5A from the groundwater being collected in the collection trench. A flexible membrane barrier layer would be installed over the collection trench to minimize the infiltration of surface water into the trench.

To address the contaminated groundwater migrating toward Onondaga Lake, an approximately 1,300-foot long, 17-foot deep collection trench would be constructed along the lakeshore north of State Fair Boulevard. On the downgradient side of the trench, a watertight sheet pile wall would be installed into the confining layer (sand, silt, and clay layer) located approximately 40 to 50 feet below the ground surface (bgs) to prevent groundwater discharge to Onondaga Lake. Deep groundwater would be collected using a system of deep wells installed above the till located at a depth of approximately 90 feet bgs. If necessary, groundwater collection wells would also be installed in the marl located above the confining layer.

The contaminated groundwater collected from the trenches and the extraction wells would be treated at a treatment plant constructed on-Site[11]. It is anticipated that the treatment system would consist of precipitation, neutralization, biological degradation, and filtration to remove inorganics, VOCs, and SVOCs. The treated water would be discharged to Onondaga Lake or injected into a groundwater aquifer.

Contaminated soil excavated from the groundwater collection trench would be disposed in accordance with applicable state and federal regulations.

As part of a long-term groundwater monitoring program, groundwater samples would be collected and analyzed semiannually in order to verify that the concentrations of groundwater contaminants are declining and that conditions are protective of human health and the environment.

Institutional controls, such as deed restrictions, would be implemented to prevent exposure to contaminated groundwater.

Because this alternative would result in contaminants remaining on-Site, CERCLA requires that the Site be reviewed at least once every five years.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, NYSDEC considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 CFR §300.430(e)(9) and OSWER Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim*

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[11] IRMs to reduce the migration of contaminated groundwater from the Willis Avenue and Wastebed B/Harbor Brook Sites are currently being evaluated. The contaminated groundwater that is collected as part of these proposed IRMs would likely be treated by this treatment plant.

Final, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other applicable federal and state environmental statutes and requirements or provide grounds for invoking a waiver. Other applicable Federal or State advisories, criteria or guidance are To-Be-Considered (TBCs). TBCs are not required by the NCP, but may be very useful in determining what is protective at a Site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital and O&M costs, and net present-worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was discussed in the Proposed Plan:

8. *Support Agency acceptance* indicates whether, based on its review of the RI/FS reports and Proposed Plan, NYSDOH concurs with, opposes, or has no comments on the selected remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS reports and Proposed Plan.

A comparative analysis of these alternatives based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Alternative SEM-1 (no further action) would not actively address the potential ecological and human health risks posed by the pond residue, which is a source of groundwater contamination. Alternative SEM-3 (containment) would provide a greater level of protection to human health and the environment than Alternative SEM-1, in that the low permeability cover under this alternative would provide protection from direct contact and reduce the migration of pond residue constituents to the groundwater. Alternative SEM-2 (pond residue reuse) and Alternative SEM-4 (on-Site incineration) would provide a greater level of protection to human health and the environment than Alternative SEM-3 through the removal and processing/treatment of the pond residue and contaminated non-pond areas in the proximity of the ponds. In addition, by removing the contaminated materials, these two alternatives would permanently eliminate the primary source of groundwater contamination.

Alternative GW-1 (no action and long-term monitoring) would not address the ongoing discharges of contaminated groundwater to Onondaga Lake and Tributary 5A. Alternative GW-2 (groundwater extraction for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), which include the collection and treatment of contaminated groundwater, would be more effective in preventing groundwater discharges to Onondaga Lake and Tributary 5A than Alternative GW-1.

The collection trench and watertight sheet pile wall that would be installed along the lakeshore under Alternative GW-3 would be more effective in containing the contaminated groundwater and preventing it from discharging to Onondaga Lake than the extraction wells alone that would be installed under Alternative GW-2.

Compliance with ARARs

There are currently no federal or state promulgated standards for contaminant levels in soils; only New York State soil cleanup objectives exist, as specified in the TAGM. The TAGM would serve as a cleanup goal for pond residue-related contaminants.

Since the pond residue would not be addressed under Alternative SEM-1 (no action), this alternative would not comply with TAGM objectives.

Alternatives SEM-2 (pond residue reuse) and SEM-4 (on-Site incineration) would involve the excavation of contaminated pond residues and materials on-Site and, therefore, would require compliance with fugitive dust and emission regulations. The processing plant would be constructed and operated in accordance with all applicable state and federal regulations. In the case of Alternative SEM-4, compliance with air emission standards would be required at the incinerator. Treatment of off-gases might be required to meet the requirements of New York State Regulations for Prevention and Control of Air Contamination and Air Pollution and would need to comply with New York State Air Guide-1 for the Control of Toxic Ambient Air Emissions. Ash generated from the incinerator would need to be tested and regulatory requirements would need to be evaluated to determine if the ash could be disposed of on-Site or if it must be disposed of at an off-Site facility.

A New York State 6 NYCRR Part 360 cap is an action-specific ARAR for closure. Under Alternative SEM-3 (containment), a Part 360 cap would be used to cover the contaminated materials located in proximity to the ponds, thereby satisfying this ARAR. Since the pond residues do not exhibit sufficient strength to support a cover consistent with the requirements of a 6 NYCRR Part 360 cap, a variance associated with the cover requirement would need to be granted by NYSDEC.

NYSDEC and EPA have promulgated health-based protective MCLs, which are enforceable standards for various drinking water contaminants (chemical-specific ARARs). Although the groundwater at the Site is not presently being utilized as a potable water source, achieving applicable MCLs in the groundwater is relevant and appropriate, because the groundwater at the Site is a potential source of drinking water. The aquifer is classified as Class GA (6 NYCRR 701.18). However, since the plume at the Semet Residue Pond site is affected by and commingled with the groundwater contamination emanating from the adjacent Willis Avenue site, no decision can be made as to whether or not groundwater quality standards can be achieved until a plan for remedial action is developed for the Willis Avenue Site.

Under Alternative GW-3, since construction of the sheet pile wall and collection trench would require work along the shoreline of Onondaga Lake, 6 NYCRR Part 608 (Protection of Waters) could be a potential location-specific ARAR. If so, the appropriate protective measures would need to be undertaken to ensure compliance with this ARAR.

Long-Term Effectiveness and Permanence

Alternative SEM-1 (no further action) would involve no active remedial measures and, therefore, would not be effective in eliminating the potential for contaminants to continue to migrate to the groundwater.

Alternative SEM-3 (containment) would reduce the residual risk of untreated waste on the Site by isolating the pond residue and contaminated materials from contact with human and environmental receptors and from the infiltration of rainwater which would mobilize contaminants. The cap covering the ponds and the 6 NYCRR Part 360 cap(s) covering the non-pond areas would require routine inspection and maintenance to insure long-term effectiveness and permanence. Routine maintenance of the Part 360 or equivalent cap(s), as a reliable management control, would include mowing, fertilizing, reseeding and repairing any potential erosion or burrowing rodent damage.

In comparison to Alternative SEM-3, Alternatives SEM-2 (pond residue reuse) and Alternative SEM-4 (on-Site incineration) would provide more permanent remediation by excavating and treating the pond residue on-Site. Alternatives SEM-2 and SEM-4 would generate treatment residuals which would have to be appropriately handled. Alternatives SEM-1 and SEM-3 would not generate such residuals.

Alternative GW-1 (no action and long-term monitoring) would be only minimally effective in the long-term in restoring groundwater quality and would not be effective in preventing contaminated groundwater migration, since it would not rely on active measures.

Alternative GW-2 (groundwater extraction for contaminated groundwater migrating toward Onondaga Lake, collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) would be significantly more effective than Alternative GW-1 in reducing contaminant migration from the Site and restoring groundwater quality. Alternative GW-3, however, would be more effective than Alternative GW-2 since a barrier would be constructed to prevent contaminated groundwater from discharging to Onondaga Lake.

Alternatives GW-2 and GW-3 would generate treatment residuals which would have to be appropriately handled. Alternative GW-1 would not generate such residuals.

Reduction in Toxicity, Mobility, or Volume Through Treatment

Alternative SEM-1 (no further action) would provide no reduction in toxicity, mobility, or volume. The treatment processes included in Alternative SEM-2 (pond residue reuse) and Alternative SEM-4 (on-Site incineration) would result in a reduction of toxicity, mobility, and

volume of the pond residue and the associated entrained water. Additionally, processes included in Alternative SEM-2 would result in a usable product with a direct societal benefit. While Alternative SEM-3 (containment) would prevent potential exposure to pond residues and contaminated materials, and would eliminate the infiltration of rainwater into the waste disposal areas and the associated leaching of contaminants from these areas, the reduction in mobility would not be accomplished through treatment.

Alternative GW-1 (no action) would not actively reduce the toxicity, mobility, or volume of contaminants in the groundwater through treatment. This alternative would rely on natural attenuation to reduce the levels of contaminants. Collecting and treating contaminated groundwater under Alternatives GW-2 (groundwater extraction for contaminated groundwater migrating toward Onondaga Lake, collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) and GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), on the other hand, would reduce the toxicity, mobility, and volume of contaminants through treatment, thereby satisfying CERCLA's preference for treatment.

Short-Term Effectiveness

Alternative SEM-1 (no further action) does not include any physical construction measures in any areas of contamination and, therefore, would not present any potential adverse impacts to on-Site workers or the community as a result of its implementation.

Alternative SEM-2 (pond residue reuse) and Alternative SEM-4 (on-Site incineration) could result in some adverse impacts to on-Site workers through dermal contact and inhalation related to the removal and treatment of the pond residue. The risks to on-Site workers under all of the alternatives could, however, be mitigated by utilizing proper protective equipment.

Under Alternatives SEM-2 and SEM-4, disturbance of the land during excavation activities could affect the surface water hydrology of the Site. There is a potential for increased stormwater runoff and erosion during excavation and construction activities that would have to be properly managed to prevent or minimize any adverse impacts. For these alternatives, appropriate measures would have to be taken during excavation activities to prevent transport of fugitive dust and volatile organic compounds to downgradient receptors. The processing plant would be constructed and operated in accordance with all applicable state and federal regulations.

All three pond residue action alternatives would increase vehicle traffic and impact the local roadway system and could subject nearby residents to increased noise levels.

Since no actions would be performed under Alternative SEM-1, there would be no implementation time. Alternative SEM-2 is estimated to consist of twelve years of construction and material processing. Maintenance of the temporary cover would be performed as part of Alternative SEM-2 until all of the pond residues have been removed from the ponds for processing. It is anticipated that Alternative SEM-3 would be completed in two years. It is estimated that it would take five years to complete Alternative SEM-4, including one year to complete construction and four years to complete the incineration of the pond residue.

All of the groundwater alternatives might present some risk to on-Site workers through dermal contact and inhalation related to groundwater sampling activities. Both of the groundwater collection and treatment alternatives, Alternative GW-2 (groundwater extraction for contaminated groundwater migrating toward Onondaga Lake, collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), could present slightly greater adverse impacts to on-Site workers, since these alternatives would involve trenching and/or installing extraction wells through potentially contaminated soils and groundwater. The risks to on-Site workers could, however, be minimized by utilizing proper protective equipment.

It is estimated that Alternative GW-1 (no action) would require one month to implement, since developing a long-term groundwater monitoring program would be the only activity that would be required. It is anticipated that the groundwater collection and treatment systems under alternatives GW-2 and GW-3 would be constructed within 1 year.

Based upon preliminary modeling results, EPA estimates that it would require in excess of 1,000 years to attain groundwater quality standards under all of the groundwater alternatives. However, the objectives of Alternatives GW-2 and GW-3 would be to prevent contaminated groundwater from discharging to and impacting Onondaga Lake and Tributary 5A.

Implementability

Alternative SEM-1 (no further action) would be easy to implement, as there are no activities to undertake. Studies performed by Honeywell concluded that the pond residue could be successfully used in the production of RT-12 (Alternative SEM-2). Material testing would be needed to confirm the ability of the floating cover in Alternative SEM-3 (containment) to maintain its integrity while in contact with the pond residue. While Alternative SEM-4 (on-Site incineration) has been determined to be a proven technology, a test burn would likely be required.

While equipment, services, and materials needed for Alternatives SEM-2 and SEM-3 are readily available, and the actions under these alternatives would be administratively feasible, equipment, services, and materials may not be readily available for Alternative SEM-4. In addition, special concerns that would need to be addressed under Alternatives SEM-2 and SEM-4 involve the capturing and treatment of residuals (volatilized contaminants, dust, and other condensates). Under Alternative SEM-4, it might be necessary to install an off-gas cleaning system.

Monitoring the effectiveness of Alternatives SEM-2 and SEM-4 would be easily accomplished through post-excavation soil sampling and analysis.

A Petition for a Beneficial Use Determination (BUD)[12] was submitted to NYSDEC by Honeywell in support of the reuse of the pond residue under Alternative SEM-2; NYSDEC has approved the BUD. This determination would allow the recovered light oil to be shipped off-Site as refinery feed stock, a coal tar plant diluent, or fuel. It will also allow the use of the pond residue's dry organic phase to produce RT-12 on-Site.

Alternative GW-1 (no action) would be easily implementable, as the only activity that would be performed would be groundwater monitoring. Alternative GW-2 (groundwater extraction for contaminated groundwater migrating toward Onondaga Lake, collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), which would require the installation of trenches and extraction wells, would be significantly more difficult to implement than Alternative GW-1. However, the groundwater extraction systems that would be used for Alternatives GW-2 and GW-3 have been implemented successfully at numerous sites to extract, treat, and hydraulically control contaminated groundwater. The precipitation, neutralization, biological degradation, and filtration treatment technologies that would be used for Alternatives GW-2 and GW-3 are proven and reliable in achieving the specified performance goals and are readily available. All equipment is readily available and easily installed.

Cost

The present-worth costs are calculated using a discount rate of seven percent and a 30-year time interval. The estimated capital, operation and maintenance (O&M), and present-worth costs for each of the alternatives are presented below.

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[12] A BUD is a determination made by NYSDEC that allows a solid waste to be used for a commercial or industrial purpose.

Pond Residue Alternatives	Capital Cost	Annual OM&M Cost	Present-Worth Cost
SEM-1	$0	$1,000	$12,400
SEM-2	$14,530,000	$3,101,500	$19,164,000 - $29,164,000
SEM-3	$15,310,000	$264,280	$18,590,000
SEM-4	$46,557,000	$0	$46,557,000

Groundwater Alternatives	Capital Cost	Annual OM&M Cost	Present-Worth Cost
GW-1	$0	$22,100	$172,000
GW-2	$5,951,000	$1,426,000	$22,282,000
GW-3	$10,624,000	$1,358,600	$27,381,000

As can be seen by the cost estimates, Alternative SEM-1 (no action) is the least costly pond residue alternative at $12,400. The cost for Alternative SEM-3, containment, was estimated at a total present worth of $18,590,000. Alternative SEM-2, pond residue reuse, was estimated within the range of $19,164,000 to $29,164,000. The cost of Alternative SEM-2 has been adjusted based on an anticipated net income (pretax) range of $10,000,000 to $20,000,000 from the sale of the product (using a 12-year construction and processing period for the Semet material). The most expensive pond residue alternative is Alternative SEM-4, on-Site incineration, which is estimated at $46,557,000.

The least costly groundwater alternative is Alternative GW-1, no action, at a present-worth cost of $172,000; the cost of Alternative GW-2 (groundwater extraction for contaminated groundwater migrating toward Onondaga Lake, collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), is $22,282,000; and the cost for Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) is $27,381,000. However, if a combination of Alternative GW-2 or GW-3 and Semet Pond Residue Alternative SEM-2 or SEM-4 were to be selected, the cost would be decreased by approximately $4,023,000 to account for capital costs associated with a wastewater treatment plant, which have already been included under Alternatives SEM-2 and SEM-4.

Support Agency Acceptance

EPA has determined that the remedy selected by NYSDEC, the lead agency for this Site, meets the requirements for remedial action set forth in CERCLA Section 121, 42 U.S.C. §9621. EPA has adopted this remedy's selection by cosigning this ROD. NYSDOH concurs with the selected remedy; its letter of concurrence is attached (see Appendix IV).

Community Acceptance

Comments received during the public comment period are summarized and addressed in the Responsiveness Summary, which is attached as Appendix V to this document.

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon consideration of the requirements of CERCLA, the detailed analysis of the alternatives, and public comments, NYSDEC and EPA have determined that Alternative SEM-2 (pond residue reuse), to address the Semet pond residue, and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), to address the groundwater contamination, are the appropriate remedies, best satisfy the requirements of CERCLA Section 121, 42 U.S.C. §9621 and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9).

Alternative SEM-1 (no further action) and Alternative GW-1 (no action and long-term monitoring) would not be protective of human health and the environment, since it would not actively address the potential human health and ecological risks posed by the contaminated media.

While Alternative SEM-2, the selected alternative, and Alternative SEM-4, on-Site incineration, would both effectively achieve the cleanup levels, Alternative SEM-2 would be considerably less expensive than Alternative SEM-4. On the other hand, Alternative SEM-2 would take longer to achieve the cleanup objectives than the other action alternatives (12 years for reuse as compared to 2 years for containment and 5 years for incineration). While the pond residues are a continuing source of groundwater contamination, the increase in the time needed to clean up the pond residues under Alternative SEM-2 would not be a significant concern with respect to groundwater quality, since EPA estimates that it would require an inordinate amount of time to attain groundwater quality standards under any of the groundwater alternatives. Also, near-term human health or ecological risks posed by the pond residues can be minimized with deed restrictions, maintenance of the temporary covers, and fencing, while the pond residue is being excavated and processed. Alternative SEM-3 would not meet the statutory preference for the use of treatment as a principal element. Consequently, NYSDEC and EPA believe that Alternative SEM-2 would effectuate the pond residue cleanup while

providing the best balance of tradeoffs among the alternatives with respect to the evaluating criteria.

The watertight sheet pile wall and collection trenches that would be installed under Alternative GW-3 would be more effective than the extraction wells and groundwater collection trench alone under Alternative GW-2 in containing the contaminated groundwater and preventing it from discharging to Onondaga Lake and Tributary 5A.

Description of the Selected Remedy

The selected remedy involves:

- Excavation and reuse of the material present in the ponds. Specifically, the material would be excavated and processed on-Site, primarily for use in the production of a soft tar product (RT-12), which will be used to make driveway sealer at an off-Site location;

- Seeps of pond residue material that exist at and in the vicinity of the Site including, but not limited to, areas to the north of the Site adjacent to the Semet Residue Ponds and south of the Site adjacent to the railroad tracks (*i.e.*, south of the containment areas) will be covered (*e.g.*, with plastic and crushed stone) until the materials are remediated to prevent human or wildlife exposure. The seep materials will be processed to produce RT-12 if this is found to be feasible. Otherwise, the materials will be addressed under the separate operable unit described below;

- Installation of a stone-filled shallow groundwater collection trench to prevent groundwater discharges to Tributary 5A and a watertight sheet pile wall, collection trench, and groundwater extraction wells to prevent groundwater discharges to Onondaga Lake, located north of the Site;

- Installation of a treatment facility at the Site to process wastewater and groundwater collected from the RT-12 processing plant and the groundwater collection system, respectively;

- Maintenance of the existing temporary covers and fencing to limit human and wildlife exposures to contaminated soils and residues while the Semet Pond residue is being excavated and processed;

- Implementation of institutional controls (*i.e.*, deed restrictions) to restrict on-Site groundwater use;

- Implementation of institutional controls to prevent human exposure to contaminated soils and residues until the pond residue components of the selected remedy are

completed, as well as remedial actions associated with the operable unit described below; and

- Long-term monitoring of the groundwater.

During the remedial design, additional investigations will be performed to identify and evaluate seeps of Semet residue. In addition, investigations may be performed to evaluate the integrity of the berms surrounding the ponds.

The Remedial Design/Remedial Action Work Plan for the implementation of the remedial action shall contain schedules for the processing of all Semet residue materials within the 12 year period, as well as milestones by which to gauge whether the project is on schedule for completion within this 12 year period. If there are any substantial delays in the implementation of the remedy, NYSDEC and EPA may take, or require responsible parties to take, further remedial actions necessary to protect human health or the environment.

Contaminated material located below and in proximity of the ponds, and in the Brushy Cleared Area which exceed Site cleanup goals for pond residue-related contaminants will be addressed under a separate operable unit. The RI/FS for the second operable unit (residual materials) will commence as soon as possible but no later than the point at which the Semet tar pond materials in the first of the five ponds have been withdrawn for processing. Any remedy that is selected to address the residual materials that cannot be so processed will be implemented in a phased manner, e.g., the remedy for the first pond that has been emptied will be implemented while the residues in the second pond are being processed, etc.

A Stage IA cultural resources survey will be performed during the remedial design phase to evaluate the sensitivity of the Site for cultural resources. The results of the Stage IA survey will be used to assist in determining if additional cultural resources survey work will be required.

Under the selected groundwater remedy, all groundwater exceeding groundwater quality standards upgradient of the collection wells or collection trench will be contained. However, since the plume at the Semet Residue Pond Site is affected by and commingled with the groundwater contamination emanating from the adjacent Willis Avenue Site, no decision can be made as to whether or not groundwater quality standards can be achieved until a plan for remedial action is developed for the Willis Avenue Site.

Summary of the Estimated Remedy Costs

The estimated capital cost for the selected remedy is $25.15 million. The estimated annual cost associated with processing the pond residue is $3.1 million for 12 years. The estimated annual O&M cost for 30 years of groundwater extraction and treatment is $1.36 million. The estimated total present-worth cost of the selected remedy ranges from $46.55

to $56.55 million. The total present worth is the sum of capital cost and the present-worth cost of O&M, which is based on a project life of 30 years and a 7% discount rate.

These engineering cost estimates are expected to be within +50 to -30 percent of the actual project cost, and are based upon the best available information regarding the anticipated scope of the selected remedy. Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the remedy.

Expected Outcomes of the Selected Remedy

Based upon the human health and ecological risk assessments, NYSDEC and EPA have determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the selected alternative or one of the other active measures considered, present a current or potential threat to public health or the environment.

Specifically, it has been concluded that: (1) trespassers and wildlife could come into contact with the pond residue; (2) the air exposure pathway is not currently complete, but could become complete if the temporary cap were to deteriorate or be removed; and (3) there is a potential risk to vegetation and to terrestrial herbivores and higher species.

The selected alternative will remove the Semet residue, contain contaminated groundwater, and prevent exposure to humans and the environment. The selected remedy will preclude the migration of contamination to the Onondaga Lake system from the Site; it will provide a reduction in the toxicity, mobility, or volume of Site-related contaminants; it will satisfy the ARARs and RAOs (with the exception of groundwater ARARs on the Site); and it will provide long-term effectiveness. Alternative SEM-2 will take longer to achieve the cleanup objectives than the other action alternatives (12 years for reuse, as compared to 2 years for containment and 5 years for incineration). Short-term human health or ecological risks posed by the pond residues and contaminated materials can be minimized with deed restrictions, maintenance of the temporary covers, and fencing, while the pond residue is being excavated and processed. The selected remedy will be cost-effective, and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The selected remedy will also meet the statutory preference for the use of treatment as a principal element. Finally, the selected remedy will provide overall protection of human health and the environment due to contaminants at the Site. These actions will restore the Site such that it can be utilized in the future in accordance with the reasonably-anticipated future land use. Under the selected remedy, it is anticipated that it will require approximately 12 years to implement the source control portion of the remedy. With regard to groundwater, it will take approximately one year to construct the groundwater collection system. Since the groundwater portion of the remedy is hydraulic containment using a groundwater barrier, extraction wells, and/or collection trenches, groundwater cleanup standards will not be achieved. The property and surrounding areas are presently zoned industrial, and the reasonably anticipated future land use is not expected to change. It is also anticipated that the future use of the Site groundwater will not be a drinking water source.

STATUTORY DETERMINATIONS

Under CERCLA Section 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a Site.

For the reasons discussed below, NYSDEC and EPA have determined that the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment through removal of the Semet residue, thereby eliminating the threat of exposure *via* direct contact with or ingestion of the contaminated media. The remedy will also preclude the migration of contamination to the Onondaga Lake System from the Site. The selected remedy will reduce exposure levels by removing the Semet residue, which is a principal threat waste. Alternative SEM-2 would take longer to achieve the cleanup objectives than the other action alternatives (12 years for reuse as compared to 2 years for containment and 5 years for incineration). Short-term human health or ecological risks posed by the pond residues and contaminated materials can be minimized with deed restrictions, maintenance of the temporary covers, and fencing, while the pond residue is being excavated and processed. The selected remedy will also provide overall protection by reducing the toxicity, mobility, and volume of contamination through the on-Site treatment/reuse of the Semet residue, and the extraction and treatment of the contaminated groundwater.

Compliance with Applicable or Relevant and Appropriate Requirements of Environmental Laws

While there are no federal or New York State soil and waste material ARARs, the remedial action goals for the site include, in part, preventing direct contact (human and wildlife) with the pond residue; reducing volatile emissions from the pond residue and eliminating, to the extent practicable, migration of groundwater to Onondaga Lake and Tributary 5A that does not attain applicable state and federal water quality criteria for Site-related constituents. The selected remedy will comply with all ARARs or justify grounds for their waiver (*i.e.*, justify grounds for not attaining ARARs). However, NYSDEC and EPA have determined that, at present, no decision can be made as to whether or not groundwater quality standards can be achieved, and that since the groundwater plume at the Semet Residue Pond Site is affected by and commingled with the groundwater contamination emanating from the adjacent Willis Avenue Site, a decision as to whether or not groundwater quality standards can be achieved cannot be made until a plan for remedial action is developed

for the Willis Avenue Site. A summary of action-specific, chemical-specific, and location-specific ARARs which will need to be complied with during implementation of the selected remedy is presented below.

Action-Specific ARARs

- Clean Air Act (CAA) National Emissions Standards for Hazardous Air Pollutants (NESHAPs), 40 CFR Parts 61 and 63

- CAA, New Source Review (NSR) and Prevention of Significant Deterioration Requirements, 40 CFR Part 52

- CAA, New Source Performance Standards (NSPS), 40 CFR Part 6

- Resource Conservation and Recovery Act (RCRA), Standards for Hazardous Waste Generators; Manifesting; Pre-Transportation; Reporting Requirements, 40 CFR Part 262 Subparts B, C, D

- RCRA Subtitle C - Hazardous Waste Management, Identification and Listing of Hazardous Wastes, 40 CFR Part 261

- Standards for Hazardous Waste Generators, Hazardous Waste Determinations, 40 CFR Part 262.11

- Standards for Hazardous Waste Generators, 90-Day Accumulation Rule, 40 CFR Part 262.34

- Standards for Owners/Operators of Hazardous Waste Treatment, Storage and Disposal (TSD) Facilities, Parts 264 and 265, Subparts B, F, G, J, S, and X

- RCRA, Standards of Capping: Surface Impoundments, Waste Piles, Landfills, Subtitle C, 40 CFR Parts 264 and 265, Subparts K, L and N

- RCRA Subtitle C, Land Disposal Restrictions (LDRs), 40 CFR Part 268

- RCRA Subtitle C, Phase IV Supplemental Proposal on Land Disposal of Mineral Processing Wastes, 62 FR 25997

- RCRA Subtitle D, Criteria for Classification of Waste Disposal Facilities, 40 CFR Part 257

- U.S. Department of Transportation Rules for Hazardous Materials Transport, 49 CFR Part 107 et. seq.

- Occupational Health and Safety Act, Worker Health and Safety, 29 CFR 1910.120 and 29 CFR 1926

- NYSDEC Identification and Listing of Hazardous Wastes, 6 NYCRR Part 371

- New York State Hazardous Waste Management Facility Regulations, 6 NYCRR Parts 370, 372 and 373

- NYSDEC Corrective Action for Solid Waste Management Units, 6 NYCRR Part 373-2.19

- New York State Solid Waste Management Facility Regulations, 6 NYCRR Parts 360 and 364

- NYSDEC LDRs, 6 NYCRR Part 376

- New York State Classifications of Surface Waters and Groundwaters, 6 NYCRR Part 701

- New York State Regulations on the State Pollution Discharge Elimination System (SPDES), 6 NYCRR Parts 750-758

- New York State Air Pollution Control Regulations, 6 NYCRR Parts 120, 200-203, 207, 211, 212 and 219

- New York State Air Quality Standards, 6 NYCRR Part 257

- Local County or Municipality Pretreatment Requirements, Local regulations

Chemical-Specific ARARs

- Safe Drinking Water Act (SDWA) MCLs and MCLGs (40 CFR Part 141)

- New York State Surface Water and Groundwater Quality Standards and Groundwater Effluent Standards, 6 NYCRR Part 703

Location-Specific ARARs

- Clean Water Act (CWA), Wastewater Discharge Permits, Effluent Guidelines, Best Available Technology (BAT) and BMPPT, 40 CFR Parts 122, 125 and 401

- Floodplain Management 40 CFR 6, Subpart A, 40 CFR 6.302

- Protection of Wetlands, 40 CFR Part 6, Subpart A

- Fish and Wildlife Coordination Act, 16 U.S.C. 661, Modification to Waterways that Affects Fish of Wildlife, 40 CFR 6.302

- National Historic Preservation Act, 16 U.S.C. 470

- New York State Freshwater Wetlands Law ECL, Article 24, 71 in Title 23

- New York State Freshwater Wetlands Implementation Program, 6 NYCRR 662 and 665

- New York State Protection of Waters Program, 6 NYCRR Part 608
- CWA Section 401, State Water Quality Certification (WQC) Program, 33 U.S.C. 1341

Other Criteria, Advisories, or Guidance To Be Considered

- Requirements for Management of Hazardous Contaminated Media (Hazardous Waste Identification Rule (HWIR) - Media), 61 FR 18879, 40 CFR Part 260, et. al.

- CAA, National Ambient Air Quality Standards, 40 CFR Part 50

- Executive Order 11990 (Protection of Wetlands)

- Executive Order 11988 (Floodplain Management)

- Land Use in the CERCLA Remedy Selection Process, OSWER Directive No. 9355.7-04

- EPA Statement of Policy on Floodplains and Wetlands Assessments for CERCLA Actions

- New York Guidelines for Soil Erosion and Sediment Control

- New York State Air Cleanup Criteria, January 1990

- SDWA Proposed MCLs

- NYSDEC, Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1, October 1998

- New York State Groundwater Effluent Limitations, TOGS 1.1.2

- NYSDEC Division of Water, Guidance on Groundwater Contamination Strategy, TOGS 2.1.1

- New York State Ambient Air Quality Guidelines, Air Guide-1
- NYSDEC Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites, October 1994
- EPA Ambient Water Quality Criteria (Federal Register, Volume 57, No. 246, December 22, 1992)
- NYSDEC Soil Cleanup Objectives, Technical Administrative Guidance Memorandum No. 94-HWR-4046

Cost-Effectiveness

For the foregoing reasons, it has been determined that the selected remedy provides for overall effectiveness in proportion to its cost.

The estimated capital costs for the selected remedy is $25.15 million. The estimated annual cost associated with processing the pond residue is $3.1 million for 12 years. The estimated annual O&M cost for 30 years of groundwater extraction and treatment is $1.36 million. The estimated total present-worth cost of the selected remedy ranges from $46.55 to $56.55 million.

Although Alternatives SEM-1 and GW-1 (no further action) are less costly than the selected remedy, no further action at the Site would not achieve the overall protection of human health and the environment, and contamination from the Site would continue to migrate into the Onondaga Lake System.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The selected remedy provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in NCP §300.430(f)(1)(i)(B), such that it represents the maximum extent to which permanence and treatment can be practicably utilized at this Site.

The selected remedy will provide a permanent solution for the Semet residue by removing them from the environment and treating principal threat waste.

With regard to the groundwater, the selected remedy will provide a permanent containment remedy and will employ extraction and treatment technologies to reduce the toxicity, mobility, and volume of the contaminants in the groundwater.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is satisfied under the selected remedy in that principal threat waste contaminated residues will be excavated for on-Site treatment, and treatment will be used to reduce the volume and toxicity of contamination in the groundwater.

Five-Year Review Requirements

Since the selected alternative will result in contaminants remaining on-Site above health-based levels, CERCLA requires that the Site be reviewed every five years. If justified by this assessment, remedial actions may be implemented in the future to remove or treat the waste.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan, released for public comment on January 19, 2002, identified Alternative SEM-2 (pond residue reuse) and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) as the selected remedy.

Based upon comments that were received during the public comment period, the selected remedy was modified as compared to the Proposed Plan. Specifically, several commenters voiced concern that Alternative SEM-2 did not identify the remedy for the ponds' residual organics (*i.e.*, pond contents and contaminated soils at the Site that cannot be processed for recycling) and it did not describe the decision logic to be employed to select an appropriate remedy for these residuals (*e.g.*, capping, removal, treatment, no action, etc.). Consequently, the selected remedy calls for these contaminated materials to be addressed under another operable unit. In addition, the remedial action objectives in the Proposed Plan called for the restoration of groundwater quality to levels which meet applicable state and federal drinking water standards. Since it is unlikely that the groundwater would be restored to groundwater quality standards within an acceptable time frame, the Proposed Plan stated that an ARAR waiver would be required. Several commenters pointed out, however, that the delineation of these areas was not adequately defined and that it was premature to waive ARARs at this time. Therefore, NYSDEC and EPA have determined that, at present, no decision can be made as to whether or not groundwater quality standards can be achieved, and that since the groundwater plume at the Semet Residue Pond Site is affected by and commingled with the groundwater contamination emanating from the adjacent Willis Avenue Site, a decision as to whether or not groundwater quality standards can be achieved cannot be made until a plan for remedial action is developed for the Willis Avenue Site.

No other significant changes to the remedy, as originally identified in the Proposed Plan, were necessary or appropriate.

APPENDIX I

FIGURES

Figure 1	Site Location Map
Figure 2	Site Map
Figure 3	Preferred Remedy (Alternatives SEM-2 and GW-3) Map
Figure 4	RI Sample Locations

FIGURE 1

SEMET RESIDUE PONDS SITE
SOLVAY, NEW YORK

SITE LOCATION MAP

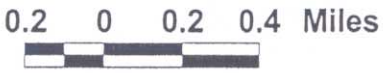
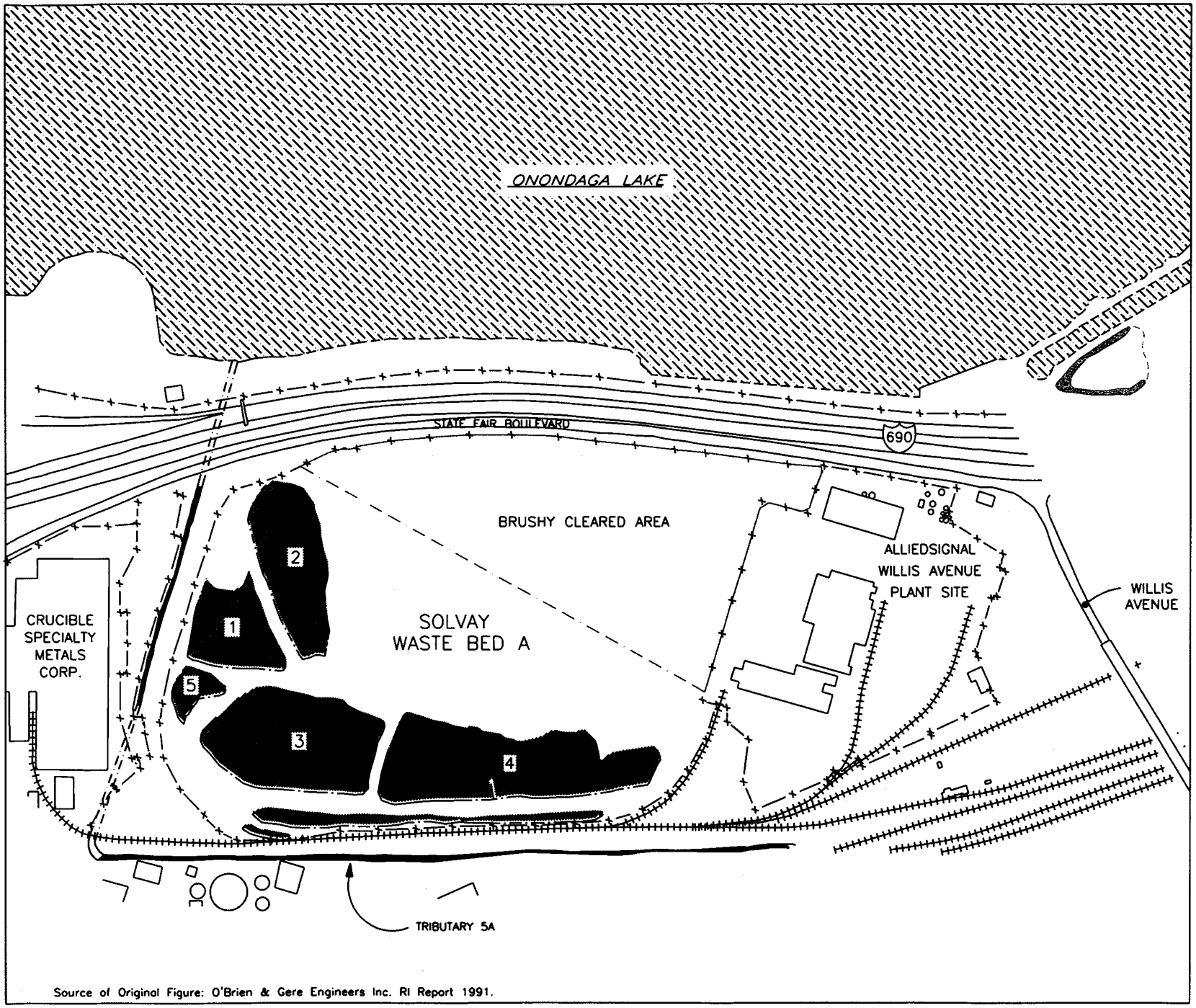


FIGURE 2



Source of Original Figure: O'Brien & Gere Engineers Inc. RI Report 1991.

LEGEND

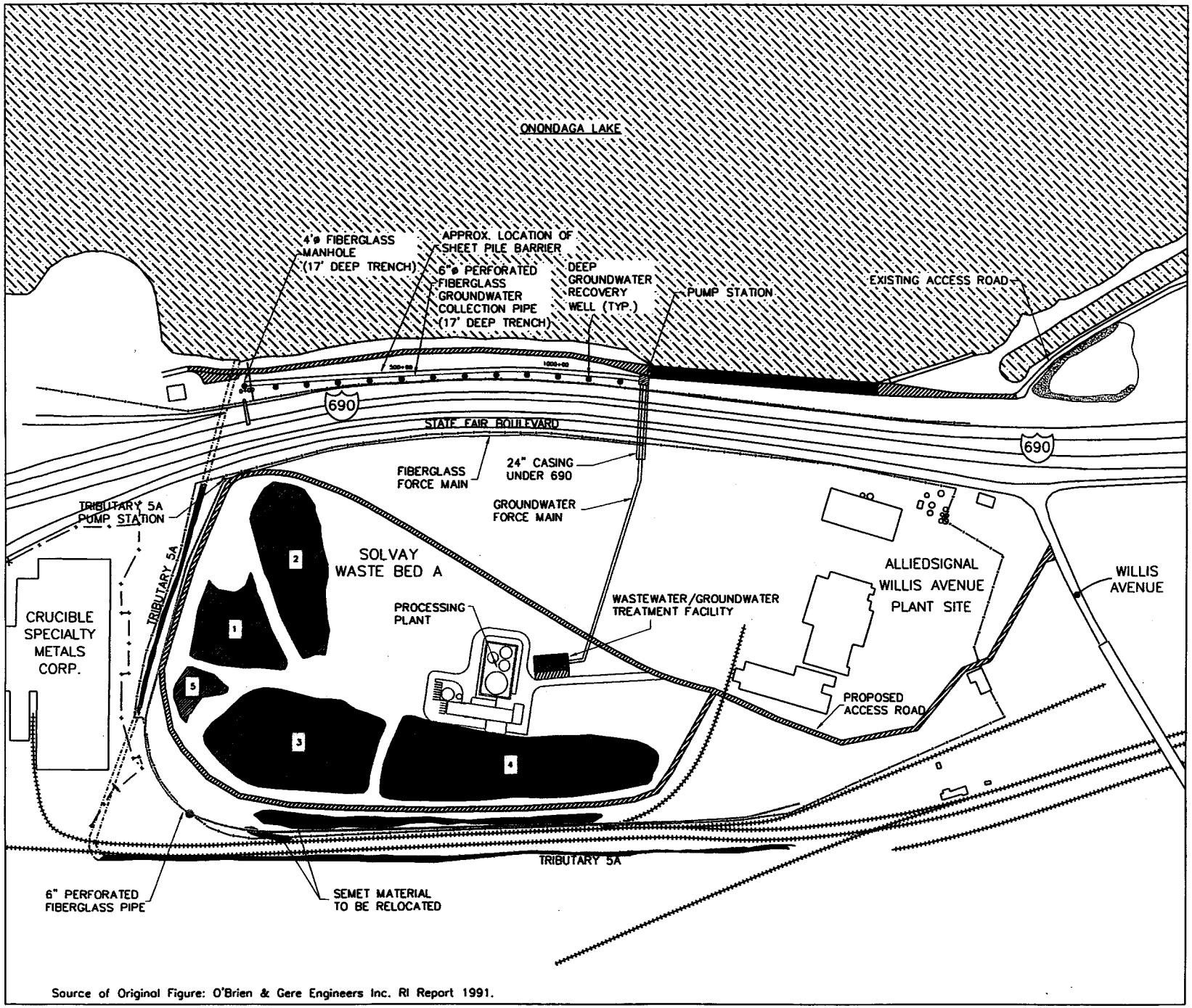
- POND LOCATION
- TRIBUTARY 5A
- TRIBUTARY 5A UNDERGROUND
- CONRAIL TRACKS
- FENCE
- APPROXIMATE BORDER OF THE BRUSHY CLEARED AREA

SEMET RESIDUE PONDS SITE
SOLVAY, NEW YORK

SITE MAP

300 0 300
SCALE IN FEET

FIGURE 3



Source of Original Figure: O'Brien & Gere Engineers Inc. RI Report 1991.

LEGEND

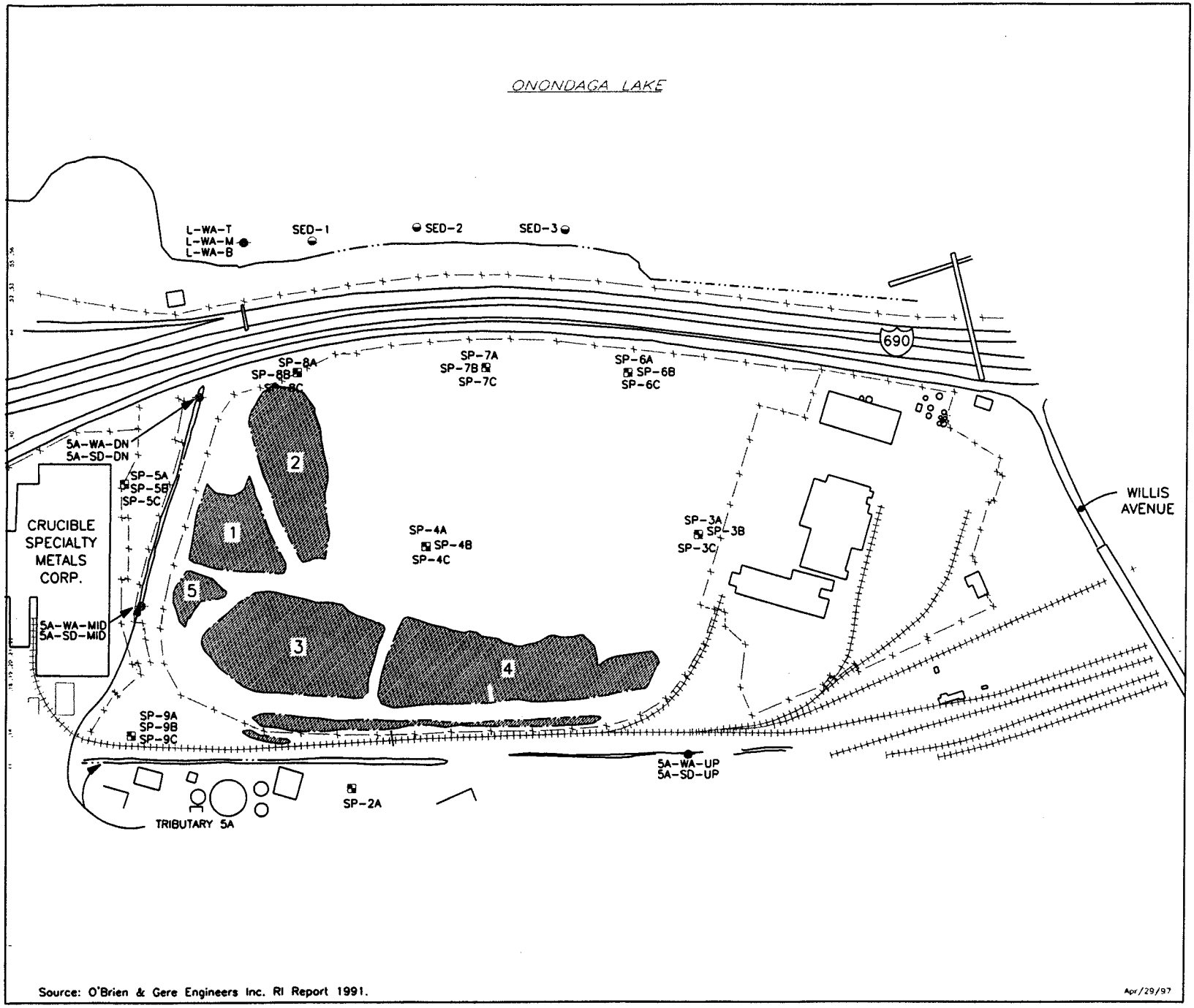
- POND LOCATION
- TRIBUTARY 5A
- TRIBUTARY 5A UNDERGROUND
- RAILROAD TRACKS
- FENCE
- ACCESS ROAD
- SHALLOW GROUNDWATER COLLECTION TRENCH
- 17' DEEP GROUDWATER COLLECTION TRENCH
- SHEET PILE BARRIER
- DEEP GROUNDWATER RECOVERY WELL
- FORCE MAIN

SEMET RESIDUE PONDS SITE
SOLVAY, NY

PREFERRED REMEDY
(ALTERNATIVES SEM-2 AND GW-3)

300 0 300
SCALE IN FEET

FIGURE 4



LEGEND

- TRIBUTARY 5A
- POND LOCATION
- RI WELL LOCATION (O'BRIEN & GERE WELL)
- RI SEDIMENT SAMPLE LOCATION
- RI SURFACE WATER SAMPLE LOCATION

NOTE: TOPOGRAPHIC INTERVAL IS 2 FEET.

SEMET RESIDUE PONDS SITE
SOLVAY, NEW YORK

RI SAMPLE LOCATION MAP

300 0 300
SCALE IN FEET

APPENDIX II

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Table 1
Round One Ground Water Samples
Inorganic Analyses

P-2A FIL	SP-2A	SP-5B	SP-5C	SP-5A	SP-9C	SP-9B	SP-9A	SP-8C	SP-8B	SP-8A	SP-3A	SP-3B	SP-6A	SP-4C FIL	SP-4C	SP-4B FIL	SP-4B	SP-4A	SP-7C	SP-7B	SP-7A	SP-3C	SP-6C	SP-6B
558F	L9558	L9559	L9560	L9561	L9562	L9563	L9564	L9565	L9566	L9567	L9568	L9569	L9571	L9681F	L9681	L9862F	L9862	L9633	L9685	L9686	L9687	L9688	L9689	L9690
4	3590	1000 U	100 U	262	433	194 U	135 U	113 U	6000	151 U	426 U	517	113 U	800 U	800 U	800 U	1810 U	210 U	659 U	730 U	129 U	216 U	400 U	574 U
4 J	341 J	1500 UJ	250 UJ	50 UJ	50 UJ	50 UJ	50 UJ	250 UJ	1500 UJ	50 UJ	100 UJ	50 UJ	50 UJ	2000 UJ	2000 UJ	2000 UJ	2000 UJ	100 UJ	750 UJ	150 UJ	50 UJ	150 UJ	1000 UJ	250 UJ
.8 J	23.3 J	20 U	20 U	4	20	4.5	7.7	20 U	20 U	2 U	2 U	20 U	2 U	20 UJ	20 UJ	20 UJ	20 UJ	2 UJ	20 UJ	20 UJ	2 UJ	20 UJ	20 UJ	20 UJ
2	1580	7890	37	37	31	20	16	241	37600	53	110	82	92	13800 J	16600 J	5300 J	5540 J	718 J	538 J	279 J	53 J	38 J	214 J	9090 J
J	1 U	30 U	5 U	1 U	1	1 U	1 U	5 U	30 U	1 U	2 U	1 U	1 U	51	51	40 U	40 U	2 U	15 U	3 U	1 U	3 U	20 U	5 U
J	3 U	90 U	15 U	3 U	3 U	3 U	3 U	15 U	90 U	3 U	6	3 U	3 U	120 UJ	120 UJ	120 UJ	120 UJ	6 UJ	45 UJ	9 UJ	3 UJ	9 UJ	60 UJ	15 UJ
200	26500	18100000	3260000	232000	571000	158000	333000	3310000	13200000	5000000	813000	270000	518000	24200000	24100000	18600000	18000000	791000	8980000	1320000	397000	1560000	10700000	3050000
	103	150 U	25 U	45	5 U	5 U	5 U	25 U	150 U	6	10 U	14	11	200 U	200 U	200 U	200 U	10 U	75 U	15 U	6	15 U	100 U	25 U
	20	150 U	25 U	5 U	5 U	5 U	5 U	25 U	150 U	5 U	10 U	5 U	5 U	200 U	200 U	200 U	200 U	10 U	75 U	15 U	5 U	15 U	100 U	25 U
U	70	150 U	5 U	9 U	5 U	5 U	5 U	25 U	14 U	6 U	5 U	9 U	8 U	27 U	58 U	79	102	5 U	6 U	41 U	5 U	15 U	5 U	7 U
4	5120	197000	24100	1100	3340	854	7570	220 U	123000	183 U	386 U	878	139 U	267000	277000	120000	136000	13[illegible] U	6390	398 U	109 U	8780	6890	45300
J	17	5 U	4 U	2 U	1 U	10	5 U	5 U	13 U	5 U	2 U	5 U	3	10 UJ	10 UJ	10 UJ	10 UJ	1 UJ	10 UJ	2 UJ	1 UJ	5 UJ	10 UJ	5 UJ
50	3750	56500	109000	6340	91000	44900	149000	96200	78900	4660	1370	24700	297 U	28300	29700	39400	42500	548	69800	2960	187	69900	121000	111000
	217	2900	715	111	142	87	213	228	1530	12	22	41	11	1630 J	1680 J	1650 J	1630 J	17 J	919 J	34 J	8 J	494 J	2970 J	961 J
U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.4	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
U	58	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 U	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ	15 UJ
90	4700	89400	48700	5840	13000	1870	1000	45100	146000	10800	42600	122000	4670	259000	275000	477000	491000	78[illegible]00	128000	57800	1000 U	63000	133000	120000
J	49 J	30 R	30 UJ	43.5 R	30 J	30 UJ	40 J	30 UJ	30 UJ	31 J	30 UJ	30 R	30 UJ	30 R	30 R	30 R	30 R	30 UJ	30 R	30 UJ	30 UJ	30 R	30 UJ	30 UJ
J	5 U	60 U	10 U	3 U	2 U	2 U	2 U	10 U	60 U	2 U	5 U	2	2 U	80 UJ	80 UJ	80 UJ	80 UJ	4 UJ	30 UJ	6 UJ	2 UJ	6 UJ	40 UJ	10 UJ
1000	265000	9610000	4170000	210000	1870000	36500	809000	2970000	8330000	106000	74600	3640000	67800	12800000	12400000	11000000	9910000	61000	8240000	943000	57200	2150000	7330000	2970000
UJ	1 UJ	5 UJ	5 UJ	5 UJ	5UJ	5 UJ	5 UJ	5 UJ	10 UJ	1 UJ	1 UJ	1 UJ	1 UJ	10 UJ	10 UJ	10 UJ	10 UJ	1 UJ	10 UJ	10 UJ	1 UJ	10 UJ	10 UJ	10 UJ
5	253	25 U	25 U	10	5 U	5	7	25 U	150 U	150 U	10 U	14	5 U	200 UJ	200 UJ	200 UJ	200 UJ	10 UJ	75 UJ	26 J	5 UJ	15 UJ	100 UJ	25 UJ
U	49 U	55 U	55 U	30 U	14 U	27 U	28 U	63 U	150 U	150 U	57 U	36 U	40 U	200 U	200 U	200 U	200 U	23 U	75 U	15 U	13 U	15 U	100 U	25 U
	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	170 J	16 J		10 U		10.5	10 U	33	10 U	30	17	80	10 U

on estimated, R - sample rejected,
mit shown)

cted

Table 2
Round One Surface Water Samples
Inorganic Analyses

SAMPLE ID	5A-WA-U	5A-WA-M	5A-WA-D	L-WA-1	L-WA-2	L-WA-3
LABORATORY ID	L7068	L7069	L7070	L7071	L7072	L7073
ANALYTE						
Aluminum	176 U	318	208 U	213 U	215 U	299
Antimony	50 U	50 U	50 U	50 U	50 U	50 U
Arsenic	8.2	2.4	2 U	2 U	2 U	2 U
Barium	38	53	317	318	318	306
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	3 U	3 U	3 U	3 U	3 U	3 U
Calcium	53,100	93,300	92,800	103,000	106,000	104,000
Chromium	5 U	55	20	20	28	38
Cobalt	5 U	10	8	11	11	13
Copper	24 U	21 U	20 U	27 U	22 U	20 U
Iron	324	1,020	597	741	910	1,180
Lead	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Magnesium	6,670	13,300	12,500	12,600	13,000	12,900
Manganese	11	198	154	162	175	180
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2
Nickel	15 U	97	68	76	84	84
Potassium	15,400	2,780	3,080	3,100	3,850	3,970
Selenium	3.2 J	3.3 R	3 UJ	3 UJ	3.3 R	3.8 J
Silver	2 U	2 U	2 U	2 U	2 U	2 U
Sodium	420,000	144,000	128,000	142,000	148,000	145,000
Thallium	15 UJ	3 UJ	3 UJ	3 UJ	3 UJ	3 UJ
Vanadium	12	8	6	7	7	14
Zinc	17 U	31 U	16 U	23 U	27 U	29 U
Cyanide	23	10 U	10 U	10 U	10 U	10 U

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected

October 28, 1991

Table 3
Round One Sediment Samples
Inorganic Analyses

SAMPLE ID	5A-SD-0	5A-SD-M	5A-SD-D	L-SD-1	L-SD-2	L-SD-3
LABORATORY ID	L7076	L7077	L7078	L7080	L7081	L7082
ANALYTE						
Aluminum	2,820 J	4,840 J	857	1,080	1,330	2,170
Antimony	31.2 J	38.5 J	31.8 U	42.5 U	45.5 U	44.7 U
Arsenic	15.6 R	14.4 R	11.3 R	0.34	0.51	5.86
Barium	194 J	310 J	310	108	114	84.3
Beryllium	2.06 J	1.76 J	1.35	0.85 U	0.91 U	0.895 U
Cadmium	1.88 UJ	2.31 UJ	1.9 UJ	2.55 U	2.73 U	2.68 U
Calcium	394,000 J	249,000 J	253,000	326,000	353,000	25,900
Chromium	33.8 J	2,380 J	704	16.5 J	4.55 UJ	59.7 J
Cobalt	5.73 J	546 J	125 J	4.25 U	4.55 U	4.47 U
Copper	91.3 J	191 J	49.6 J	5.18	4.66 U	49
Iron	20,500 J	44,300 J	32,800	2,380	2,360	8,660
Lead	4,100 J	133 J	119	1.22 U	0.836 UJ	22.5
Magnesium	3,320 J	13,500 J	16,500	3,240	3,890	5,200
Manganese	162 J	1450 J	251	187 J	183 J	179 J
Mercury	1.29 J	0.789 J	0.127 U	0.17 U	8.61	0.179
Nickel	13.3 R	913 R	170 R	5.2	2.73 U	11.8
Potassium	312 J	510 J	127 U	170 U	182 U	344
Selenium	4.68 UJ	1.16 UJ	1.9 UJ	2.55 UJ	2.73 UJ	2.68 UJ
Silver	1.25 UJ	2.38 J	1.64	1.7 U	2.44	1.79 U
Sodium	2,260 J	874 J	702	2,600	2,440	3,540
Thallium	0.936 UJ	1.16 UJ	0.381 U	0.51 U	0.546 U	0.537
Vanadium	27.3 J	925 J	278	4.67	4.55 U	13
Zinc	385 J	279 J	30.8	12.3	8.11	37.5
Cyanide	1.56 UJ	2.89 J	0.635 U	0.85 U	0.91 U	0.895

units - µg/kg, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected

October 28, 1991

mg/kg (Per 8/25 telecon w/ J. Banikowski (OBG))

Table 4
Round One Ground Water Samples
PCB Analyses

SAMPLE ID	SP-2A	SP-5B	SP-5C	SP-5A	SP-9C	SP-9B	SP-9A	SP-4C	SP-8B	SP-8A	SP-3A	SP-3B	SP-6A	SP-4C	SP-4B	SP-4A	SP-7C	SP-7B	SP-7A	SP-3C	SP-6C	SP-6B
LABORATORY ID	L9558F	L9559	L9560	L9561	L9562	L9563	L9564	L9565DL	L9566DL	L9567	L9568DL	L9569DL	L9571	L9681	L9682	L9683	L9685	L9686	L9687	L9688	L9689	L9690DL
ANALYTE																						
Aroclor-1221	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Aroclor-1232	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Aroclor-1242	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Aroclor-1248	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
Aroclor-1254	1 U	1 U	1 U	1 U	1 U	1 R	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U
Aroclor-1260	1 U	1 U	1 U	1 U	1 U	1 R	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected

Table 5
Round One Sediment Samples
PCB Analyses

SAMPLE ID	5A-SD-U	5A-SD-M	5A-SD-D	L-SD-1	L-SD-2	L-SD-2
LABORATORY ID	L7076	L7077	L7078	L7080	L7081	L7082
ANALYTE						
Aroclor-1221	250 UJ	3,100 UJ	100 UJ	140 UJ	150 UJ	140 UJ
Aroclor-1232	250 UJ	3,100 UJ	100 UJ	140 UJ	150 UJ	140 UJ
Aroclor-1242	250 UJ	3,100 UJ	100 UJ	140 UJ	150 UJ	140 UJ
Aroclor-1248	250 UJ	3,300 J	100 UJ	140 UJ	150 UJ	140 UJ
Aroclor-1254	500 UJ	2,300 J	220 J	280 UJ	300 UJ	280 UJ
Aroclor-1260	500 UJ	6,200 UJ	200 UJ	280 UJ	300 UJ	280 UJ

units - µg/kg, J - concentration estimated, R - sample rejected,
U - not detected (detection limit shown)

- Analyte detected.

Table 6
Round One Ground Water Samples
Volatile Organic Analyses

SAMPLE ID	SP-2A	SP-5B	SP-5C	SP-5A	SP-9C	SP-9B	SP-9A	SP-8C	SP-8B	SP-8A	SP-3A	SP-3B	SP-6A	SP-4C	SP-4B	SP-4A	SP-7C	SP-7B	SP-7A	SP-3C	SP-6C	SP-6B
LABORATORY ID	L9558F	L9559	L9560	L9561	L9562	L9563	L9564	L9565DL	L9566DL	L9567	L9568DL	L9569DL	L9571	L9681	L9862	L9683	L9685	L9686	L9687	L9688	L9689	L9690DL
ANALYTE																						
Carbon Disulfide	5 U	5 U	2 J	29	2 J	1 J	5 U	50 U	2,000 U	5 U	25 U	180 J	5 U	50 U	100 U	100 U	10 U	50 U	5 U	0.7 J	25 U	500 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U	2,000 U	5 U	25 U	250 U	5 U	50 U	100 U	100 U	10 U	50 U	5 U	0.6 J	25 U	500 U
Chloroform	5 J	5 U	5 U	5 U	5 U	5 U	5 U	50 U	2,000 U	5 U	25 U	250 U	5 U	50 U	100 U	100 U	2 J	50 U	5 U	5 U	25 U	500 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U	2,000 U	5 U	25 U	250 U	5 U	50 U	100 U	100 U	10 U	50 U	5 U	2 J	25 U	500 U
2-Butanone	10 R	160 J	10 R	10 R	10 R	10 R	10 R	100 R	4,000 R	10 R	50 R	500 R	10 R	340	710	16 J	20 U	110	10 R	10 R	50 R	1,000 U
Benzene	5 U	5 U	5 U	3 J	5 U	5 U	8	660	55,000	180	11 J	6,000	43	21 J	360	7,300	120	1,600	190	1 J	460	18,000
Toluene	5 U	5 U	5 U	0.6 J	5 U	5 U	5 U	75	3,900	5 U	25 U	250 U	50	7 J	48 J	890	2 J	40 J	6	5 U	25 U	920
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U	2,000 U	5 U	47	580	5 U	50 U	100 U	100 U	10 U	12 J	5 U	5 U	25 U	500 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	50 U	2,000 U	5 U	25 U	250 U	9	50 U	100 U	100 U	10 U	50 U	5 U	5 U	25 U	500 U
Xylene (total)	5 U	5 U	5 U	2 J	5 U	5 U	5 U	23 J	2,000 U	0.6 J	25 U	250 U	210	50 U	100 U	210	10 U	50 U	6 J	5 U	25 U	500 U
TICs	7 J	30 J			32 J	18 J					510 J		258 J						8 J			

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)
- Analyte Detected.

October 28, 1991

Table 7
Round Two Ground Water Samples
Volatile Organic Analyses

SAMPLE ID	SP-2A	SP-5B	SP-5C	SP-5A	SP-9C	SP-9B	SP-9A	SP-8C	SP-8B	SP-8A	SP-3A	SP-3B	SP-6A	SP-4C	SP-4B	SP-4A	SP-7C	SP-7B	SP-7A	SP-3C	SP-6C	SP-6B
LABORATORY ID	L9558F	L9559	L9560	L9561	L9562	L9563	L9564	L9565DL	L9566DL	L9567	L9568DL	L9569DL	L9571	L9681	L9862	L9683	L9685	L9686	L9687	L9688	L9689	L9690DL
ANALYTE																						
Benzene	5 U	25 U	5 U	5 U	5 U	5 U	580	640	46,000	440	45	6,400	64	50 U	120 U	4,000	100	3,700	160	5 U	410	15,000
Toluene	5 U	25 U	5 U	5 U	5 U	5 U	25 U	80	3,800	20 U	5 U	250 U	25 U	50 U	120 U	450	5 U	240	5	5 U	25 U	1,100
Chlorobenzene	5 U	25 U	5 U	5 U	5 U	5 U	25 U	25 U	2000 U	20 U	75	560	25 U	50 U	120 U	250 U	5 U	120 U	5 U	5 U	25 U	500 U
Ethylbenzene	5 U	25 U	5 U	5 U	5 U	5 U	25 U	25 U	2000 U	20 U	5 U	250 U	25 U	50 U	120 U	250 U	5 U	120 U	5 U	5 U	25 U	500 U
Xylene	5 U	25 U	5 U	5 U	5 U	5 U	25 U	25 U	2000 U	20 U	5 U	250 U	25 U	50 U	120 U	250 U	5 U	120 U	5 U	5 U	25 U	500 U

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)
- Analyte Detected.

October 28, 1991

Table 8
Round One Surface Water Samples
Volatile Organic Analyses

SAMPLE ID	5A-WA-U	5A-WA-M	5A-WA-D	L-WA-1	L-WA-2	L-WA-3
LABORATORY ID	L7068	L7069	L7070	L7071	L7072	L7073
ANALYTE						
Carbon Disulfide	5 U	1 J	5 U	5 U	5 U	5 U
Chlorform	3 J	7	7	7	7	7
Bromodichloromethane	5 U	1 J	2 J	2 J	2 J	2 J
Benzene	18	110	79	87	92	87
Toluene	0.8 J	13	10	9	10	9
Chlorobenzene	0.5 J	5 U	5 U	1 J	1 J	1 J
Xylene (total)	5 U	3 J	3 J	3 J	3 J	3 J

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected

October 28, 1991

Table 9
Round Two Surface Water Samples
Volatile Organic Analyses

SAMPLE ID	5A-WA-U	5A-WA-M	5A-WA-D	L-WA-1	L-WA-2	L-WA-3
LABORATORY ID	L7068	L7069	L7070	L7071	L7072	L7073
ANALYTE						
Chlorform	14	14	16	14	19	5 U
Benzene	30	31	33	34	110	5 U
Toluene	5 U	5 U	5 U	5 U	16	5 U

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected

October 28, 1991

Table 10
Round One Sediment Samples
Volatile Organic Analyses

SAMPLE ID	5A-SD-U	5A-SD-M	5A-SD-D	L-SD-1	L-SD-2	L-SD-2
LABORATORY ID	L7076	L7077	L7078	L7080	L7081	L7082
ANALYTE						
Methylene Chloride	14 J	2,400 UJ	5 J	3 J	4 J	210 J
Carbon Disulfide	16 UJ	2,400 UJ	16	8 U	15	1,100 UJ
Benzene	16 UJ	25,000 J	6 U	8 U	190	16,000 J
Toluene	16 UJ	9,400 J	6 U	8 U	7 J	2,400 J
Chlorobenzene	16 UJ	2,400 UJ	82	3 J	540 J	65,000 J
Ethylbenzene	16 UJ	500 J	1 J	8 U	3 J	490 J
Xylene (total)	16 UJ	10,000 J	6 U	8 U	9 U	5,400 J

units - µg/kg, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected.

Table 11
Round Two Sediment Samples
Volatile Organic Analyses

SAMPLE ID	5A-SD-U	5A-SD-M	5A-SD-D
LABORATORY ID	L7076	L7077	L7078
ANALYTE			
Benzene	6 U	19,000	6 U
Toluene	6 U	8,500	6 U
Xylene (total)	6 U	6,200	6 U

units - µg/kg, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)
- Analyte Detected.

October 28, 1991

Table 12
Round One Ground Water Samples
Semi-volatile Organic Analyses

SAMPLE ID	SP-2A	SP-5B	SP-5C	SP-5A	SP-9C	SP-9B	SP-9A	SP-8C	SP-8B	SP-8A	SP-3A	SP-3B	SP-6A	SP-4C	SP-4B	SP-4A	SP-7C	SP-7B	SP-7A	SP-3C	SP-6C	SP-6B
LABORATORY ID	L9558	L9559	L9560	L9561	L9562	L9563	L9564	L9565	L9566	L9567	L9568	L9569	L9571	L9681	L9862	L9683	L9685	L9686	L9687	L9688	L9689	L9690
ANALYTE																						
phenol	10 U	79	11 R	11 U	11 U	10 U	11 U	26	10,000	11 U	11 U	11	11 U	11 U	5,300	10 U	10 R	390	2 J	11 U	2 J	800 J
2-Chlorophenol	10 U	12 U	11 R	11 U	11 U	10 U	11 U	11 U	1100 U	11 U	11 U	24	11 U	11 U	1100 U	10 U	10 U	11 U	11 U	11 U	11 U	28
1,3-Dichlorobenzene	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	190	11 U	11 U	11 U	110 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U
1,4-Dichlorobenzene	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	260	10 J	11 U	11 U	110 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U
Benzyl alcohol	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	63 J	11 U	11 U	11 U	11 U	11 U	110 U	10 U	10 U	9 J	11 U	11 U	11 U	11 U
1,2-Dichlorobenzene	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	210	9 J	11 U	11 U	110 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U
2-Methylphenol	10 U	12 U	11 R	20 J	11 U	10 U	11 U	10 U	39 J	11 U	11 U	22	2 J	11 U	200 J	2 J	10 U	21	11 U	11 U	11 U	270 J
4-Methylphenol	10 U	12 U	11 R	11 U	11 U	10 U	11 U	3 J	1,500	11 U	11 U	6 J	11 U	2 J	8,100 J	10 U	2 J	93	11 U	11 U	11 U	5,000
Isophorone	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	11 U	11 U	11 U	11 U	3 J	10 U	10 U	6 J	11 U	11 U	11 U	11 U
2,4-Dimethylphenol	10 U	12 U	11 R	2 J	11 U	10 U	11 U	11 U	72 J	11 U	11 U	11 U	11 U	11 R	1,100 U	10 U	10 U	21 J	11 U	11 U	11 U	26
Benzoic acid	50 U	60	55 U	56 U	53 U	52 U	53 U	18 J	2,300 J	57 U	3 J	52 U	56 U	54 U	1,300	50 U	52 U	150 J	4 J	57 U	56 U	54 U
Napthalene	10 U	12 U	11 U	5 J	11 U	10 U	11 U	64	1,100 J	11 U	5 J	9 J	27 J	3 J	19 J	170	10 U	8 J	6 J	11 U	11 U	11 U
4-Chloroanaline	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	11 U	4 J	11 U	11 U	11 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U
2-Methylnapthalene	1 J	12 U	11 U	2 J	11 U	10 U	11 U	1 J	11 R	11 U	11 U	11 U	2 J	11 U	11 U	17 J	10 U	11 U	11 U	11 U	11 U	11 U
Acenapthene	1 J	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 U	11 U	11 U	11 U
Dibenzofuran	10 U	12 U	11 U	5 J	11 U	10 U	11 U	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	2 J	10 U	11 U	11 U	11 U	11 U	11 U
Diethylphthalate	10 U	12 U	11 U	11 U	14 J	10 U	7 J	11 J	11 R	11 U	11 U	7 J	11 U	11 U	9 J	10 U	10 U	11 U	2 J	2 J	3 J	320 J
Fluorene	10 U	12 U	11 U	4 J	11 U	10 U	11 U	53 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 J	11 U	11 U	11 U
Phenanthrene	2 J	12 U	11 U	5 J	11 U	10 U	2 J	11 U	11 R	11 U	1 J	11 U	11 U	11 U	11 U	2 J	10 U	11 U	11 J	11 U	11 U	11 U
Anthracene	10 U	12 U	11 U	2 J	11 U	10 U	11 U	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 J	11 U	11 U	11 U
Fluoroanthene	3 J	12 U	11 U	2 J	11 U	10 U	2 J	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 J	11 U	11 U	11 U
Pyrene	3 J	12 U	11 U	1 J	11 U	10 U	2 J	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 J	11 U	11 U	11 U
Chrysene	2 J	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 J	11 U	11 U	11 U
Benzo(b)fluoranthene	1 J	12 U	11 U	11 U	11 U	10 U	11 U	11 U	11 R	11 U	11 U	11 U	11 U	11 U	11 U	10 U	10 U	11 U	11 J	11 U	11 U	11 U
Analine									170									25				

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected.

October 28, 1991

Table 13
Round Two Ground Water Samples
Semi-volatile Organic Analyses

SAMPLE ID	SP-8B
LABORATORY ID	M8750
ANALYTE	
phenol	11,000
2-Chlorophenol	1000 U
1,3-Dichlorobenzene	1000 U
1,4-Dichlorobenzene	1000 U
Benzyl alcohol	1000 U
1,2-Dichlorobenzene	1000 U
2-Methylphenol	1000 U
4-Methylphenol	1000
Isophorone	1000 U
2,4-Dimethylphenol	1000 U
Benzoic acid	3000 J
Napthalene	1000 U
4-Chloroanaline	1000 U
2-Methylnapthalene	1000 U
Acenapthene	1000 U
Dibenzofuran	1000 U
Diethylphthalate	1000 U
Fluorene	1000 U
Phenanthrene	1000 U
Anthracene	1000 U
Fluoroanthene	1000 U
Pyrene	1000 U
Chrysene	1000 U
Benzo(b)fluoranthene	1000 U
Analine	

units - g/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected.

May 7, 1992

Table 14
Round One Surface Water Samples
Semi-volatile Organic Analyses

	5A-WA-U	5A-WA-M	5A-WA-D	L-WA-1	L-WA-2	L-WA-3
LABORATORY ID	L7068	L7069	L7070	L7071	L7072	L7073
ANALYTE						
1,4 Dichlorobenzene	2 J	10 U	11 U	11 U	10 U	10 U
Naphthalene	10 U	1 J	11 U	11 U	10 U	10 U
2,4,5-Trichlorophenol	1 J	1 J	4 J	52 U	1 J	50 U
Diethylphthalate	2 J	4 J	11 U	11 U	4 J	2 J
n-Nitrosodiphenylamine	70	10 U	11 U	11 U	10 U	10 U
Pentachlorophenol	50 U	50 U	6 J	52 U	50 U	50 U
di-n-Butylphthalate	10 U	5 J	11 U	11 U	10 U	10 U
Pyrene	2 J	10 U	11 U	11 U	10 U	10 U
bis(2-ethylhexyl)phthalate	870	10 U	10 U	11 U	10 U	10 U

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit showm)
- Analyte detected.

October 28, 1991

Table 15
Round One Sediment Samples
Semi-volatile Organic Analyses

SAMPLE ID	5A-SD-U	5A-SD-M	5A-SD-D	L-SD-1	L-SD-2	L-SD-3
LABORATORY ID	L7076	L7077	L7078	L7080	L7081	L7082
ANALYTE						
Phenol	1,000 UJ	980 J	420 U	560 U	610 U	1,000 J
1,3-Dichlorobenzene	190 J	1,300 UJ	420 U	560 U	610 U	600 U
1,4-Dichlorobenzene	560 J	1,300 UJ	220 J	560 U	490 J	11,000
1,2-Dichlorobenzene	410 J	1,300 UJ	420 U	560 U	180 J	6,600
Benzoic Acid	470 J	6,400 UJ	2,100 U	68 J	3,000 U	3,000 U
Nephthalene	1,000 J	3,400 J	200 J	560 UJ	200 J	62,000
2-Methylnaphthalene	470 J	280 J	61 J	560 UJ	610 U	19,000
Acenaphthylene	210 J	1,300 UJ	420 U	560 UJ	610 U	2,400 J
Acenaphthene	450 J	1,300 UJ	100 J	560 UJ	610 U	600 U
Dibenzofuran	820 J	160 J	120 J	560 UJ	610 U	7,400
Fluorene	610 J	1,300 UJ	98 J	560 UJ	610 U	12,000
Phenanthrene	3,900 J	520 J	310 J	130 J	610 U	24,000
Anthracene	920 J	530 J	110 J	560 U	610 U	8,500
Fluoranthene	6,100 J	540 J	540 J	160 J	610 U	13,000
Pyrene	7,600 J	600 J	570 J	130 J	610 U	9,400
Benzo(a)anthracene	3,200 J	1,300 UJ	330 J	560 J	610 U	3,400J
Chrysene	4,300 J	260 J	360 J	66 J	610 U	3,500 J
Benzo(b)fluoranthene	5,200 J	1,300 UJ	480 J	560 U	610 U	2,200 J
Benzo(k)fluroanthene	4,200 J	1,300 UJ	420 J	560 U	610 U	2,200 J
Benzo(a)pyrene	2,900 J	160 J	320 J	560 U	610 U	1,900 J
Ideno(1,2,3-cd)pyrene	2,100 J	1,300 UJ	200 J	560 U	610 U	890 J
Dibenzo(a,h)anthracene	450 J	1,300 UJ	420 U	560 U	610 U	160 J
Benzo(g,h,i)perylene	1,900 J	1,300 UJ	180 J	560 U	610 U	620 J

units - µg/kg, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected

October 28, 1991

Table 16
Site Related Compounds Detected
Above Ground Water ARARs

SAMPLE ID		SP-2A	SP-5B	SP-5C	SP-5A	SP-9C	SP-9B	SP-9A	SP-8C	SP-8B	SP-8A	SP-3A	SP-3B	SP-6A	SP-4C	SP-4B	SP-4A	SP-7C	SP-7B	SP-7A	SP-3C	SP-6C	SP-6B
LABORATORY ID		L9558	L9559	L9560	L9561	L9562	L9563	L9564	L9565	L9566	L9567	L9568	L9569	L9571	L9681	L9862	L9683	L9685	L9686	L9687	L9688	L9689	L9690
ANALYTE	ARAR																						
Aniline	5									170									25				
Benzene	0.7	5 U	5 U	5 U	3 J	5 U	5 U	8	660	55000	180	11 J	6000	43	21 J	360	7300	120	1600	190	1 J	460	18000
Benzoic Acid	50	50 U	60	55 U	56 U	53 U	52 U	53 U	18 J	2,300 J	57 U	3 J	52 U	56 U	54 U	1,300	50 U	52 U	150 J	4 J	57 U	56 U	54 U
Benzyl Alcohol	50	10 U	12 U	11 U	11 U	11 U	10 U	11 U	11 U	63 J	11 U	11 U	11 U	11 U	11 U	110 U	10 U	10 U	9 J	11 U	11 U	11 U	11 U
2-Butanone	50	10 R	160 J	10 R	10 R	10 R	10 R	10 R	100 R	4,000 R	10 R	50 R	500 R	10 R	340	710	16 J	20 U	110	10 R	10 R	50 R	1,000 U
Carbon Disulfide	50	5 U	5 U	2 J	29	2 J	1 J	5 U	50 U	2,000 U	5 U	25 U	180 J	5 U	50 U	100 U	100 U	10 U	50 U	5 U	0.7 J	25 U	500 U
2,4-Dimethylphenol	1 *	10 U	12 U	11 R	2 J	11 U	10 U	11 U	11 U	72 J	11 U	11 U	11 U	11 U	11 R	1100 U	10 U	10 U	21 J	11 U	11 U	11 U	26
2-Methylphenol	1 *	10 U	12 U	11 R	20 J	11 U	10 U	11 U	10 U	39 J	11 U	11 U	22	2 J	11 U	200 J	2 J	10 U	21	11 U	11 U	11 U	270 J
4-Methylphenol	1 *	10 U	12 U	11 R	11 U	11 U	10 U	11 U	3 J	1500	11 U	11 U	6 J	11 U	2 J	8100 J	10 U	2 J	93	11 U	11 U	11 U	5000
Napthalene	50	10 U	12 U	11 U	5 J	11 U	10 U	11 U	64	1100 J	11 U	5 J	9 J	27 J	3 J	19 J	170	10 U	8 J	6 J	11 U	11 U	11 U
phenol	1 *	10 U	79	11 R	11 U	11 U	10 U	11 U	26	10000	11 U	11 U	11	11 U	11 U	5300	10 U	10 R	390	2 J	11 U	2 J	800 J
Toluene	5	5 U	5 U	5 U	0.6 J	5 U	5 U	5 U	75	3900	5 U	25 U	250 U	50	7 J	48 J	890	2 J	40 J	6	5 U	25 U	920
Xylene	5 **	5 U	5 U	5 U	2 J	5 U	5 U	5 U	23 J	2000 U	0.6 J	25 U	250 U	210	5 U	100 U	210	10 U	50 U	6 J	5 U	25 U	500 U

units - µg/liter, J - concentration estimated, R - sample rejected,
U - analyte not detected (detection limit shown)

- Analyte Detected Above ARARs.

* - Standard for total phenolic compounds is 1 µg/liter.

** - Standard refers to each isomer individually.

Table 17
Summary of Chemicals of Potential Concern

ORGANIC COMPOUNDS	Tributary 5A Surface Water ug/l	Tributary 5A Sediments ug/kg	Ground Water ug/l
Benzene	31 - 110	<6 - 25,000(J)	<5 - 55,000
Carbon Disulfide	1(J) - <5	16 - <2,400(J)	<5 - 180(J)
Toluene	<5 - 13	<6 - 9,400(J)	<5 -3,900
Xylene (total)	3(J)	<6 - 10,000(J)	<5 - 210
Phenol		<420 - 980(J)	<10 - 10,000
2,4-Dimethylphenol			<10 - 72(J)
Benzyl Alcohol			<10 - 63(J)
2-Methylphenol			<10 - 270(J)
4-Methylphenol			<10 - 8,100(J)
Benzoic Acid			<50 - 2,300(J)
Naphthalene	<11 - 1(J)	200(J) - 3,400(J)	<10 - 1,100(J)
2-Methylnaphthalene			<10 - 17(J)
Aniline			25 - 170
2-Butanone			<20 - 710
Isophorone			<10 - 6(J)

(J) = estimated

APPENDIX III

ADMINISTRATIVE RECORD INDEX

Administrative Record Index
Semet Residue Ponds Site

(New York State Inactive Hazardous Waste Disposal Site #7-34-008)

RI/FS Activities	Document
Pre-Remedial Investigation Information	History of the Semet Residue Ponds, Geddes, New York (September 1989) Public Health Assessment of Onondaga Lake by the New York State Department of Health (July 24, 1995) Public Health Assessment of Onondaga Lake by the US Dept. of Health & Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (July 24, 1995) Citizen Participation Plan for the Onondaga Lake National Priority List Site (January 1996)
Remedial Investigation / Feasibility Study Work Plan Approved	Scope of Work (Work Plan) for the Remedial Investigation/Feasibility Study, Semet Residue Ponds, Geddes, New York (August 1990)
Feasibility Study Started Remedial Investigation Completed	Remedial Investigation for the Semet Residue Ponds Site, Geddes, New York (October 1991, revised May 1992) Volume I: Text, Tables, and Figures Volume II: Appendices A-L Review of Semet Residue Ponds Risk Assessments, Geddes, New York, TAMS Consultants Inc., (March 19, 1999)

Beneficial Use Determination	Petition for Beneficial Use Determination Alternative 2 - Reuse for the Semet Residue Ponds Site, Geddes, New York (December 1999) Semet Residue Project Tar Products Analyses (July 2000) [This information has been established in a confidential section of the Administrative Record and is not available for public inspection due to confidentiality considerations] Letter from A. J. Labuz of Honeywell to NYSDEC regarding the Semet Residue Ponds Beneficial Use Determination (November 7, 2000) [This information has been established in a confidential section of the Administrative Record and is not available for public inspection due to confidentiality considerations] Letter from A. J. Labuz of Honeywell to NYSDEC regarding the Semet Residue Ponds Beneficial Use Determination (November 15, 2000) Letter from A. J. Labuz of Honeywell to NYSDEC regarding the Semet Residue Ponds Beneficial Use Determination (January 25, 2001) [This information has been established in a confidential section of the Administrative Record and is not available for public inspection due to confidentiality considerations] Letter from A. J. Labuz of Honeywell to NYSDEC regarding the Semet Residue Ponds Beneficial Use Determination (January 31, 2001) Letter from A. J. Labuz of Honeywell to NYSDEC regarding the Semet Residue Ponds Beneficial Use Determination (April 10, 2001) Letter from A. J. Labuz of Honeywell to NYSDEC regarding the Semet Residue Ponds Beneficial Use Determination (April 19, 2001) [This information has been established in a confidential section of the Administrative Record and is not available for public inspection due to confidentiality considerations] Email from NYSDEC to A. J. Labuz of Honeywell regarding the Semet Residue Ponds Beneficial Use Determination (May 23, 2001) Honeywell Semet Residue Ponds Beneficial Use Determination Approval (January 14, 2002)

Feasibility Study Completed	Feasibility Study Report for the Semet Residue Ponds Site, Geddes, New York (June 1999) Semet Residue Ponds Site - Cleanup Time Calculations (Estimated), (August 25,1999) Revised Semet Residue Ponds Feasibility Study Alternatives for the Collection and Treatment of Groundwater (January 3, 2000) Revised Semet Residue Ponds Feasibility Study - Alternatives for the Collection and Treatment of Groundwater (July 2000) Letter from A. J. Labuz of Honeywell to NYSDEC regarding conceptual approach, estimated costs and schedule for the Semet Ponds/Willis Ave. groundwater and DNAPL IRM (August 1, 2000) Semet Residue Ponds Water Treatment Capital and O&M Costs (May 15, 2001) Semet Residue Ponds Remedial Alternative Revised Costs (August 17, 2001)
National Remedy Review Board	Response to National Remedy Review Board Recommendations for the Semet Residue Ponds Sub-Site of the Onondaga Lake Superfund Site (March 28, 2002)
Diphenylethanes	Material Safety Data Sheet: Phenyl-Xylyl-Ethane, PXE (July 1982) Edisol® XT - Summary of Toxicological and Environmental Data (July 24, 1987) Material Safety Data Sheet: ADEKA ULTRA SEAL® A-50 (April 10, 1995) Material Safety Data Sheet: Phenyl Xylyl Ethane (PXE) (March 25, 1996) Chemical Identification, Health Hazard Data: Phenylxylylethane (date unknown, from website: http://siri.org/msds/tox/f/q20/q729.html) Chemical Identification, Health Hazard Data: Phenyltolylethane (date unknown, from website: http://siri.org/msds/tox/f/q21/q537.html)
Proposed Plan Released Start of Public Comment Period	Proposed Plan (January 2000) Public Notice of Administrative Record Availability Notices of Public Meetings and Opportunity to Comment

Public Meeting Held	Documentation and Transcripts of Meetings (Attached to the Record of Decision) Written Comments on Selected Remedy Submitted by the Public and Honeywell International (Attached to the Record of Decision)
Close of Public Comment Period Record of Decision Issued	 Record of Decision and Responses to Comments (Responsiveness Summary) - March 28, 2002
Interim Remedial Measures (IRMs)	Posi-Shell Cover Material IRM Work Plan (July 14, 1995) Semet Tar Beds Site - IRM Modification (September 17, 1996) Semet Tar Pond Cover - Modification to IRM (May 14, 1997) Semet Residue Ponds - IRM Cover (January 22, 1998)
Enforcement Documents	RI/FS Consent Order for the Semet Residue Ponds Site (1989) RI/FS Consent Decree for the Onondaga Lake Sediments (March 16, 1992) Section 104(e) Letters to, and responses from, Honeywell International, Inc. Interim Remedial Measure Consent Decree (December 28, 1994) - IRM for the temporary cover Modification to the Interim Remedial Measure Consent Decree (October 22, 1996) - IRM for the temporary cover Letter to Mark White, Plant Manager, AlliedSignal, Inc. informing AlliedSignal of the Semet Residue Ponds Site's NPL status (June 23, 1997) Amended RI/FS Consent Decree for the Onondaga Lake Sediments (January 22, 1998)

APPENDIX IV

NYSDOH LETTER OF CONCURRENCE

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY

Semet Residue Ponds Site
Sub-Site of the Onondaga Lake Superfund Site

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Semet Residue Ponds Sub-Site (Site), Remedial Investigation and Feasibility Study (RI/FS) and Proposed Plan, and the responses of the New York State Department of Environmental Conservation (NYSDEC) and the U.S. Environmental Protection Agency (EPA) to those comments and concerns. All comments summarized in this document have been considered in NYSDEC and EPA's final decision in the selection of a remedy to address the contamination at the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The January 2002 Proposed Plan, which identified NYSDEC and EPA's preferred remedy and the basis for that preference, and RI/FS reports were made available to the public in both the Administrative Record and information repositories maintained at the NYSDEC Albany and Syracuse offices; the information repository at the Onondaga County Public Library, Syracuse Branch at the Galleries, 447 South Salina Street, Syracuse New York; and the information repository at the Atlantic States Legal Foundation, 658 West Onondaga Street, Syracuse, New York. A notice of availability for the above-referenced documents was published in the *Post Standard* on January 19, 2002. The original public comment period was held from January 19, 2002 to February 18, 2002. An extension of the public comment period was granted until March 20, 2002.

On February 6, 2002, NYSDEC conducted a public meeting at the Geddes Town Hall to present the findings of the RI/FS, answer questions from the public about the Site and the remedial alternatives under consideration, and accept public comments. Approximately 25 people, including local residents and representatives of the media, environmental groups, Honeywell International, Inc. (hereinafter, Honeywell, the potentially responsible party), and federal, state, and local governments, attended the public meeting.

OVERVIEW

The Proposed Plan identified the preferred remedy for the Site as: the excavation of the Semet pond residue and on-Site processing of the residue into benzene, light oil, and a soft tar product (RT-12) to be used in the manufacturing of driveway sealer (at an off-Site location); installation of a stone-filled shallow groundwater collection trench to prevent

groundwater discharges to Tributary 5A and a barrier wall, collection trench, and groundwater extraction wells to prevent groundwater discharges to Onondaga Lake (groundwater collected by both systems would be processed by an on-Site treatment facility); contaminated material located below and in proximity of the ponds and in the Brushy Cleared Area which exceed Site cleanup goals for pond residue-related contaminants would be addressed; seeps of Semet Residue material that exist at and in the vicinity of the Site would be identified and addressed; long-term monitoring would be implemented; and institutional controls would be implemented.

Commenters on the Proposed Plan included Atlantic States Legal Foundation, Onondaga County, the Central New York Chapter of the Izaak Walton League, Onondaga County Health Department, Honeywell International, Inc., the Iroquois Group of the Sierra Club, the Onondaga Nation, and some local citizens. While some commenters indicated in their comments that they support the beneficial reuse of the tar waste material, some commenters indicated that the selected remedy does not fully address all of the contamination present at the Site, principally, because the remedy does not identify the response action for the residual waste following source removal, capture all of the contaminated groundwater, provide a market analysis for the reuse products, clean up the Site so that natural vegetation and trees can be restored and the Site reclaimed for use as a park, or address safety issues with respect to contaminants in the driveway sealer material. The commenters also stated that the supporting documents did not adequately explain why a slurry wall was removed from the remedial options and they objected to the twelve-year implementation period. The Central New York Chapter of the Izaak Walton League indicated that they support the pond residue reuse alternative, but have concerns with how residuals and groundwater migration will be addressed. The Onondaga County Health Department and Honeywell stated that they support the selected remedy.

Attached to this Responsiveness Summary are Appendices V-a and V-b, which consist of letters submitted during the public comment period and a transcript of the public meeting for the Proposed Plan, respectively.

SUMMARY OF COMMENTS AND RESPONSES

The public comments received and corresponding NYSDEC and EPA responses have been organized into the following topics:

- Remedial Investigation and Feasibility Study
- Public Participation
- Proposed Plan
- Diphenylethanes

A summary of the comments and concerns and NYSDEC and EPA's responses are provided below:

Remedial Investigation and Feasibility Study

Comment #1: A commenter disputed the basis in the FS report for the rejection of solid and/or hazardous waste facility regulatory requirements as Applicable or Relevant and Appropriate Requirements (ARARs) for the Site.

Response #1: The FS Report's references to the Semet Pond residue material as being exempt from solid and hazardous waste regulatory requirements only applies to the material after it is reclaimed and processed, and it meets the chemical and physical specifications established in accordance with the Beneficial Use Determination (BUD)[1] petition approved by NYSDEC. The following Resource Conservation and Recovery Act (RCRA) and Solid Waste requirements are ARARs for the Site:

- RCRA Standards for Hazardous Waste Generators; Manifesting; Pre-Transportation; Reporting Requirements, 40 CFR Part 262 Subparts B, C, D
- RCRA Subtitle C - Hazardous Waste Management, Identification and Listing of Hazardous Wastes, 40 CFR Part 261
- Standards for Hazardous Waste Generators, Hazardous Waste Determinations, 40 CFR Part 262.11
- Standards for Hazardous Waste Generators, 90-Day Accumulation Rule, 40 CFR Part 262.34
- Standards for Owners/Operators of Hazardous Waste Treatment, Storage and Disposal Facilities, Parts 264 and 265, Subparts B, F, G, J, S, and X
- NYSDEC Identification and Listing of Hazardous Wastes, 6 NYCRR Part 371
- New York State Hazardous Waste Management Facility Regulations, 6 NYCRR Parts 370, 372 and 373

[1] A BUD is a determination made by NYSDEC that allows a solid waste to be used for a commercial or industrial purpose.

- NYSDEC Corrective Action for Solid Waste Management Units, 6 NYCRR Part 373-2.19

- New York State Solid Waste Management Facility Regulations, 6 NYCRR Parts 360 and 364

- NYSDEC LDRs, 6 NYCRR Part 376

Comment #2: A commenter stated that there has been a failure, to date, to integrate the findings of Semet Residue Ponds Site investigations into the Onondaga Lake Bottom RI/FS process.

Response #2: The results of the Semet Residue Ponds Site RI/FS, as well as other sub-sites, are being incorporated into the Onondaga Lake Bottom RI/FS.

Comment #3: A commenter stated that the use of a bentonite slurry wall was not adequately addressed in the remedial options considered in the FS.

Response #3: Because of the close proximity of the collection trench to Onondaga Lake, a watertight sheet pile wall would be much easier to install than a bentonite slurry wall. Therefore, a bentonite slurry wall is not a component of the selected remedy.

Comment #4: A commenter asked why it is necessary to process or incinerate the Semet residue on-Site. Furthermore, the commenter asked if the FS investigated off-Site processing or incineration.

Response #4: The initial screening of alternatives in the FS process considered the alternatives' effectiveness (the degree to which an alternative reduces toxicity, mobility, or volume through treatment, minimizes residual risks and affords long-term protection, complies with ARARs, minimizes short-term impacts, and how quickly it achieves protection), implementability (the technical feasibility and availability of the technologies each alternative would employ and the administrative feasibility of implementing the alternative), and cost (the costs of construction and any long-term costs to operate and maintain the alternatives are considered). While the initial screening in the FS determined that both off-Site processing and incineration of the 80 million gallons of pond residue would be effective and implementable, the cost of these alternatives would be significantly greater than on-Site processing and incineration. Therefore, the off-Site processing

and incineration alternatives were eliminated from further consideration. It should be further noted that the selected residue processing alternative is a remediation-based decision, not a profit-based decision. A long-term business operation is not being constructed here. When the residues are used up, the processing facility will cease to have any utility. Under these circumstances, in addition to the increased costs of off-Site facilities, it would be extremely difficult to site such a facility elsewhere, since there would be no commitment to long-term operations.

Comment #5: A commenter asked why the RI/FS for this site has taken over 10 years to complete.

Response #5: The RI/FS commenced in 1990. Although the first draft RI report was submitted in 1991, revisions were required before it was approved in 1995. Since using the Semet pond residue to produce RT-12 is an innovative technology, treatability testing was necessary. In addition, multiple submissions of the FS report were necessary before it could be finalized. Lastly, the BUD approval process took approximately two years to complete.

Public Participation

Comment #6: Several commenters stated that the public should be allowed to fully participate and comment during the Remedial Design/Remedial Action (RD/RA) phase with respect to the adequacy of the design and its implementation.

Response #6: Under EPA's Technical Assistance Grant (TAG) program, monies are provided to hire a technical advisor so as to help communities affected by Superfund sites understand and comment on site-related information, and, thus, participate more effectively in cleanup decisions. In 1995, EPA awarded a TAG to the Atlantic States Legal Foundation, and that group's technical advisor has provided input related to the various Onondaga Lake sub-sites. During the RD/RA, it is anticipated that Atlantic States Legal Foundation's technical advisor will continue to provide input. In addition, the citizen participation program will continue throughout the RD and RA phases, and the public is welcome to review all future RD/RA-related documents. These documents will be available for review in information repositories maintained at the Onondaga County Public Library, 447 South Salina Street, Syracuse New York and the Atlantic

States Legal Foundation, 658 West Onondaga Street, Syracuse, New York.

Comment #7: A commenter stated that the public participation process does not afford the time frame that the age of the problem deserves. The commenter requested a new informational program with an additional comment period. The commenter stated that the community affected directly by the Site and the larger community affected by Onondaga Lake, should have an awareness of the plan and a voice in the solution.

Response #7: NYSDEC and EPA rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS reports and the Proposed Plan were made available to the public for a public comment period which began on January 19, 2002 and concluded on March 20, 2002. NYSDEC and EPA also conducted a public meeting to discuss the results of the RI/FS and the Proposed Plan. The final decision regarding the selected remedy was made after NYSDEC and EPA took into consideration all public comments and concerns. In addition, please note that during the course of RD/RA, NYSDEC staff will be available to discuss any concerns the public may have with regard to the implementation of the remedy.

Proposed Plan

Comment #8: A commenter asked if the remediation would be conducted on-Site.

Response #8: Alternative SEM-2 (pond residue reuse) and Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) would be performed on-Site. The processing plant and wastewater treatment plant would be constructed on-Site to process the Semet pond residue and treat wastewater/collected groundwater, respectively.

Comment #9: Several commenters stated that the preferred remedial alternative does not identify the manner in which material that is described as “residual contamination” and/or as “exceeding Site cleanup goals” will be handled.

Response #9: Because of the uncertainty as to what residuals would be found below and in proximity of the ponds, once the contents of the ponds were removed, the Proposed Plan could not be very specific with regard to how the residuals would be handled (covered in-place and/or excavated and treated on-Site, consolidated and covered, and/or disposed of off-Site). However, based on comments that were received on the Proposed Plan, NYSDEC and EPA have decided that the selected remedy will not address these residues. Instead, once the residues can be characterized (*i.e.*, after the pond contents have been removed), a remedy decision related to these residues will be made under a separate operable unit.

Comment #10: A commenter asked whether a market analysis was performed on the products that would be produced under the preferred alternative, Alternative SEM-2 (pond residue reuse).

Response #10: A market analysis was performed by Honeywell as part of the BUD process that was required by NYSDEC to consider the reuse of the Semet pond residue. Submittals from Honeywell indicated that market conditions support the manufacture of the products that would be produced under Alternative SEM-2. Specifically, the recovered benzene would be shipped off-Site for use by refineries or chemical plants as benzene feed stock. The recovered light oil would be shipped off-Site as refinery feed stock, a coal tar plant diluent, or fuel. This light oil could also be used on-Site as a fuel for heating purposes. The “dry” organic phase would be used to produce a soft tar product (RT-12), which would be used to make driveway sealer at an off-Site location. In addition, Honeywell has obtained letters of intent from prospective purchasers of the above-noted materials. The market analysis and other product development information is contained in a separate section of the Administrative Record for the Site.

Comment #11: A commenter asked if the RT-12 that would be produced would have soil and/or acid present.

Response #11: Soil would be separated out by a centrifuge during the processing of the Semet pond residue. Tests performed by Honeywell as part of the BUD process have determined that acid would not be present in the RT-12 that would be produced.

Comment #12: A commenter expressed concern about the potential chemical compounds that will be present in the soft tar product (RT-12) that will be produced from the Semet pond residue. Another commenter expressed concern about the safety of the driveway sealer which will be made from RT-12.

Response #12: A chemical analysis of the RT-12 produced from the Semet pond residue was performed by Honeywell as part of the BUD process. Submittals from Honeywell indicated that the RT-12 products are comparable to RT-12 that is currently produced commercially from other sources.

As with any driveway sealer, the containers of the driveway sealers produced from the RT-12 will need to be appropriately labeled and safety precautions noted.

Comment #13: A commenter expressed concern with the 12-year implementation period for Alternative SEM-2, pond residue reuse. In addition, the commenter asked whether the remedy was profit-driven or remediation-driven.

Response #13: As was noted in Response #4, the selected residue processing alternative is a remediation-based decision, not a profit-based decision.

The pond residue poses a considerable threat to public health and the environment. The purpose of remediating the pond residue is to address these threats. The selected remedy will address the threat, but at the same time, produce useful products. In order for the remedy to be implemented, there needs to be a market for the products that will be produced. While removing and processing 80 million gallons of pond residue could likely be performed in less than 12 years, the estimated time frame was based upon market conditions. While Honeywell will receive an anticipated net pretax income in the range of $10,000,000 to $20,000,000 from the sale of the products that will be produced, this will only offset the cost of the remedy. Taking into consideration the noted income, the remedy will still cost Honeywell from $19,000,000 - $29,000,000 to implement.

Comment #14: A commenter stated that the annual operation and maintenance (O&M) costs for Alternative SEM-2 (pond residue reuse) do not make it significantly more cost-effective than Alternative SEM-4 (on-site incineration).

Response #14: The conventional means of comparing remediation costs is to use present-worth costs. A present-worth cost is the sum of the cost to construct the remedy and the present value of the annual O&M costs over the life of the project. The estimated present-worth cost of Alternative SEM-2 ranges from $19,164,000 to $29,164,000[2]. The estimated present-worth cost of Alternative SEM-4 is $46,557,000. Hence the difference between the present-worth costs of these two alternatives is significant.

Comment #15: Several commenters expressed concern related to uncontrolled air emissions. In addition, several commenters asked whether the excavation, handling, and on-Site processing of the Semet pond residue under Alternative SEM-2 (pond residue reuse) would comply with all air pollution requirements.

Response #15: As a result of odor complaints and sample results in 1995 and 1996 which documented air releases, a fly-ash/cement cover was applied to the ponds to control odors and reduce air emissions. Since that time, this cover material has been applied annually.

Alternative SEM-2, which would involve the excavation of contaminated pond residues and materials, would require compliance with fugitive dust and emission regulations. The processing plant would be constructed and operated in accordance with all applicable state and federal regulations. Therefore, implementation of Alternative SEM-2 would comply with all applicable air pollution requirements.

Comment #16: A commenter expressed concern about truck traffic and noise related to the implementation of the remedy at the Site.

Response #16: The final product will be pumped into either rail cars or tank trucks and transported to manufacturers of driveway sealer. Since the Site is located adjacent to a ramp to Interstate Route-690, if trucks are used, it is not anticipated that there would be any truck traffic through residential areas.

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[2] The present-worth cost has been adjusted based on an anticipated net income (pretax) range of $10,000,000 to $20,000,000 from the sale of the product.

Although the Site is located in an industrial area and noise is not anticipated to be a concern for residential areas, measures to control noise will be considered during the RD.

Comment #17: A commenter asked about the contingency for remedy failure if the pond residue remedy cannot be implemented.

Response #17: It is anticipated that the implementation of the selected remedy for addressing the pond residue will result in a beneficial re-use of these materials. However, if the remedy cannot be properly implemented, NYSDEC and EPA would need to consider other beneficial/reuse options or remedial alternatives (such as incineration) for addressing these materials.

Comment #18: A commenter asked whether Alternative SEM-2 (pond residue reuse) would require a five-year review.

Response #18: If a remedy will result in contaminants remaining on-Site above health-based levels, then the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or the Superfund law) requires that the Site be reviewed every five years. If contamination is not left on-Site following the completion of Alternative SEM-2, then a five-year review related to Alternative SEM-2 would not be necessary. However, since the remedy will take approximately 12 years to implement, at least two 5-year reviews will be conducted while the remedy is being implemented.

It should be noted that the selected groundwater remedy, Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment), will result in contaminants remaining on-Site above health-based levels. Therefore, CERCLA requires that the Site be reviewed at least once every five years.

Comment #19: Several commenters stated that Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment) will not address the contaminated groundwater that has already

migrated beyond the proposed barrier wall location. In addition, the discharge of contaminants to Onondaga Lake may impact a future lake remedy.

Response #19: Under the selected groundwater remedy, a barrier system will be installed as close as is technically feasible to the lake so as to contain as much contaminated groundwater as is possible. The contaminated groundwater located within the narrow area that would exist between the barrier and Onondaga Lake would flush to Onondaga Lake over time. However, given the limited areal extent of this groundwater, it is not anticipated that this ground water would affect a future lake remedy.

Comment #20: Several commenters expressed concern that the proposed depths and locations of the extraction wells and the proposed depth of the barrier wall would not be adequate to contain the groundwater plume.

Response #20: The remedy will be designed to collect all contaminated groundwater that is located upgradient of the barrier/collection system. The proposed depths and locations of the extraction wells and the proposed depth of the barrier wall that are currently proposed are based upon information derived from the RI/FS. The number, depths, and locations of groundwater extraction wells, as well as the depth of the barrier necessary to contain the contaminated groundwater, will be determined during the RD phase.

Comment #21: A commenter stated that the Site should be returned to its original, pristine state. Several commenters expressed concern that the remedy will not restore the Site for future productive use.

Response #21: The purpose of Superfund response actions is to address the contamination at hazardous waste sites so as to minimize the threat to public health and the environment, consistent with the reasonably-anticipated future use for the sites. Based on a number of factors, including the reported history of land use in the area of the Site since the early 1900's and the existing zoning for the Site property, the reasonably-anticipated future use for the Site is industrial. After the Semet pond residue is processed and the residual contamination is addressed (under a separate operable unit), any future use of the property will have to be consistent with the applicable zoning requirements and the long-term remedy.

Comment #22: A commenter asked if after the implementation of the remedy, would the property be able to be sold or developed.

Response #22: While the property can be sold at any time, since ownership of a Superfund site may convey responsible party liability, it is not likely that a buyer would be interested in purchasing the property until the Site is remediated. After the Semet pond residue is processed and the residual contamination has been addressed, the property could then be developed. As is noted in the previous response, any development would need to be consistent with the applicable zoning requirements and the long-term remedy.

Comment #23: A commenter asked how, under Alternative SEM-2 (pond residue reuse), storm water runoff and groundwater infiltration would be avoided in the excavated areas.

Response #23: Under Alternative SEM-2, disturbance of the land during excavation activities could affect the surface water hydrology of the Site. There is a potential for increased storm water runoff and erosion during excavation and construction activities that would have to be properly managed to prevent or minimize any adverse impacts. Various engineering controls to address the increased storm water runoff and erosion, as well as infiltration within and adjacent to the excavated areas, would need to be evaluated during the RD.

Comment #24: A commenter expressed concern that the remedial activities associated with the seeps will simply cover them to prevent human and wildlife exposures.

Response #24: Seeps of pond residue material that exist at and in the vicinity of the Site including, but not limited to, areas to the north of the Site adjacent to the Semet Residue Ponds and south of the Site adjacent to the railroad tracks (*i.e.*, south of the containment areas) will be covered (*e.g.*, with plastic and crushed stone) until the materials are remediated to prevent human or wildlife exposure. The seep materials will be processed to produce RT-12 if this is found to be feasible. Otherwise, the materials will be addressed under a separate operable unit.

Comment #25: A commenter stated that in order to prevent further contamination to Onondaga Lake and Tributary 5A via changes in the hydraulic characteristics of the Site due to the excavation of the Semet pond

residue, the groundwater collection system should be installed and the treatment system operational prior to excavating and processing the Semet pond residue under Alternative SEM-2 (pond residue reuse).

Response #25: It is anticipated that the groundwater barrier/collection system and groundwater treatment system will be constructed concurrent with the construction of the pond residue processing plant and that the treatment system will be in operation prior to the commencement of excavation of the Semet pond residue for processing.

Comment #26: A commenter inquired as to the sampling requirements and sampling frequency for the groundwater collection system, the analytes that will be analyzed for the groundwater collection system, and the sampling requirements and the performance standards for the water treatment plant. Two commenters inquired about the treatment standards for the water treatment plant.

Response #26: The specifics of the groundwater monitoring will be contained in an operation and maintenance plan, which will be developed during the RD phase. Although the performance standards for the water treatment plant will be developed during the RD, the treated water will need to comply with New York State surface water discharge or groundwater quality requirements, depending upon whether the treated water is discharged to Onondaga Lake or injected into the groundwater, respectively.

Comment #27: A commenter sought confirmation that contamination from the Site has been and is being transported to Onondaga Lake and is responsible for contaminating both lake sediments and the water column.

Response #27: Groundwater data in the lakeshore area indicates that Site-related contamination is being discharged to Onondaga Lake. Site-related contaminants have been detected in lake sediments and surface water samples collected in close proximity to the Site.

Comment #28: A commenter inquired as to why Alternative GW-3 (hydraulic containment using a groundwater barrier, extraction, and collection trench for contaminated groundwater migrating toward Onondaga Lake, groundwater collection trench for contaminated groundwater migrating toward Tributary 5A, and on-Site groundwater treatment)

does not mention a dense non-aqueous phase liquid (DNAPL) Interim Remedial Measure (IRM) that has been proposed by Honeywell.

Response #28: The DNAPL IRM that has been proposed by Honeywell is for the adjacent Willis Avenue site.

Comment #29: A commenter expressed concern that sacred, historic, archeological, and culturally-significant sites and properties will be disturbed and impacted by the selected remedy.

Response #29: The excavations that are to be conducted as part of the selected remedy are to be conducted in previously-disturbed areas of the Site (*i.e.*, residue ponds, areas of fill, and Solvay Waste areas[3]). As a result, it is not anticipated that sacred, historic, archeological, and culturally-significant areas will be disturbed by the actions undertaken in the selected remedy. Nevertheless, the selected remedy will include the completion of a cultural resources survey of the Site prior to conducting the RD to indicate the level of sensitivity for cultural resources at the Site.

Comment #30: A commenter suggested further analysis of what lies below the Solvay Waste present at the Site.

Response #30: Soil borings have shown that Solvay Waste is present to a depth of approximately 30 to 40 feet below the ground surface with marl, silt, clay, and sand located below. After the Semet pond residues are excavated, the extent of residual contamination will be assessed as part of a second operable unit.

Comment #31: A commenter asked how many years it would take to commence the implementation of the selected remedy.

Response #31: Following the selection of a remedy for the Site, it is anticipated that it will take six months to a year to negotiate the terms of a legal agreement for the performance of design and construction of the remedy with Honeywell. It is anticipated that the design will take one to two years to complete. Therefore, it is anticipated that it will take two to three years to start work at the Site.

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[3] Much of the Site was used as a settling basin for Honeywell's disposal of Solvay Waste, a grayish-white colored material consisting largely of calcium carbonate that was a waste by-product from the production of soda ash.

Comment #32: A commenter stated that due to the expansion of the recreation trail around the lake and the magnitude of the destiNY USA project[4], greater attention should be given to the avoidance of public nuisance risks and requiring remedies that enhance the productive reuse of the lake shore properties. Given this, the commenter stated that the residual contamination remaining after the removal of the Semet pond residue should be classified as a separate and distinct operable unit.

Response #32: Due to the current inability to access the materials which underlie the Semet pond residues, NYSDEC and EPA agree that the residual contamination that will remain after the removal of the Semet pond residues should be addressed in a separate operable unit.

Comment #33: A commenter stated that once the Semet Residue material is removed from the 5 lagoons, according to the proposed remedy, underlying soils and temporary cover material that cannot be processed into useable products will need to be properly managed. Spoils from the installation of the preferred groundwater alternative will also require management. The commenter recommended that the remedy incorporate a concept of an Active Waste Management Unit (AWMU), located within the boundaries of the Semet Residue Ponds Site, to manage these or other materials that could appropriately remain on-Site.

Response #33: Remedial options for the contaminated materials located below and in proximity of the Semet residue ponds and in the Brushy Cleared Area which exceed Site cleanup goals and those which cannot be processed into RT-12 will be evaluated under a separate operable unit for the Site. Alternatives that are evaluated could include the construction of an AWMU at the Site. Other options might include covering in-place and/or excavation and treatment on-Site, consolidation and covering, and/or disposal off-Site. With regard to the spoils that would be generated during the construction of the groundwater collection systems, there is not adequate information to determine if the disposal of these materials in an on-Site cell would be appropriate. NYSDEC is willing to consider data that will be collected during the RD to determine whether or not on-Site disposal of these materials would be appropriate. If the construction of an on-Site cell was determined to be technically appropriate, given the magnitude of such a change, the proposed change to the remedy

[4] A planned $1.7 billion retail/entertainment center.

would necessitate a formal modification to the remedy and would be subject to public comment.

Comment #34: In order to address the Site more comprehensively, a commenter proposed that the response actions for this Site be reclassified as Operable Unit 1 to address source materials (*i.e.*, the reuse and/or disposal of waste pond materials), Operable Unit 2 to address groundwater contamination, and Operable Unit 3 to address the remedial response for all residual waste materials after completion of the Operable Unit 1 response.

Response #34: While NYSDEC and EPA agree with the commenter that reclassifying the response actions at the Site into multiple components is appropriate, the Agencies have decided to employ a slightly different approach, as follows:

- The primary Semet Residue Pond site remedy will consist of the Semet pond residue reuse and containment of the groundwater.

- Due to the current inability to characterize the contaminated materials which underlie the Semet pond residues, the residual contamination that will remain after the removal of the Semet pond residues will be addressed under a separate operable unit.

- Since the plume at the Semet Residue Pond Site is affected by the groundwater contamination emanating from the adjacent Willis Avenue Site, no decision can be made as to whether or not groundwater quality standards can be achieved at the Semet Residue Pond Site until a plan for remedial action is developed for the Willis Avenue Site.

Comment #35: A commenter stated that if Alternative SEM-2, pond residue reuse, will not work properly, then the commenter would prefer that Alternative SEM-4 (on-site incineration) be implemented. This decision should, however, take into account possible environmental or human health issues

Response #35: It is anticipated that the implementation of the selected remedy for addressing the pond residue will result in the beneficial re-use of these materials. However, if the remedy cannot be properly implemented, NYSDEC and EPA will need to consider other

beneficial/reuse options or remedial alternatives (such as incineration) for addressing these materials. Any selected remedy would need to be protective of human health and the environment.

Comment #36: A commenter stated that the Proposed Plan does not mention the requisite surface water or air permits associated with the material processing, wastewater treatment system, and/or discharge outlet.

Response #36: Where on-Site actions are exempt from permitting requirements, the substantive requirements of all permits will need to be met. The specific surface water discharge (or groundwater reinjection) and air emission requirements will need to be defined by NYSDEC during the design phase.

Comment #37: A commenter stated that given the particularly hazardous nature of the Semet pond residue, the potentially significant regulatory requirements and cost considerations related to handling and processing this material needs to be assessed.

Response #37: The regulatory requirements and costs related to the pond residue reuse remedy were considered in its selection. NYSDEC and EPA believe that Alternative SEM-2 will effectuate the pond residue cleanup while providing the best balance of tradeoffs among the alternatives with respect to the evaluating criteria (which consider regulatory requirements and costs).

Comment #38: A commenter stated that exposure of workers to contaminants would be reduced under Alternative SEM-4 (on-site incineration) as compared to Alternative SEM-2 (pond residue reuse), since the Semet pond residue would be addressed in five years instead of twelve.

Response #38: While Alternative SEM-2 would subject on-Site workers to longer-term exposure to contaminants than Alternative SEM-4, the risks to on-Site workers would be mitigated by utilizing proper protective equipment.

Comment #39: A commenter stated that continued monitoring of the Semet Residue Ponds Site will be necessary to ensure that receiving waters, such as Onondaga Lake, are not adversely affected. Another commenter stated that all the former Allied/Honeywell hazardous waste sites should be monitored.

Response #39: As part of the selected remedy, a long-term groundwater monitoring program will be implemented to ensure that the selected groundwater remedy is protective of public health and the environment and that it is functioning as designed. Groundwater samples will be collected and analyzed in order to verify that contaminated groundwater is not migrating into Tributary 5A or Onondaga Lake.

With regard to monitoring at the other Onondaga Lake Site sub-sites, monitoring programs have been put into place for the remedies that have been selected and will be considered, as necessary, in future remedy decisions.

Comment #40: A commenter stated a preference for an alternative that would process the wastes into the three aforementioned products, but would not use the solid fraction for driveway sealer. Instead, the material would be burned for energy in a coal burning electric generating station. This alternative would also use the waste material for a beneficial use—namely, energy recovery.

Response #40: During the FS, Semet pond residue samples were sent to a number of interested firms to assess the feasibility of using the Semet pond residue for energy recovery. All of the proposals that were received were not cost-effective, as compared to those technologies evaluated for on-Site treatment or disposal.

Diphenylethanes[5]

Comment #41: A commenter indicated that the tarry fraction that is to be used as driveway sealer is very much an unknown and untested entity. It has been conclusively established through research conducted at the State University of New York, College of Environmental Science and Forestry that diphenylethanes were formed during the production of benzene, toluene, and xylene by Allied Chemical & Dye, Co. in Solvay, NY. As a result, diphenylethanes form a significant fraction

[5] The below comments refer to the properties and toxicity of PXE and PTE. Material Safety Data Sheets (MSDS) and other information (included in the Administrative Record), mainly for PXE, were consulted to aid in responding to the questions posed regarding the properties and toxicity of PXE and PTE. Given the structural similarity between PXE and PTE, it is believed that PXE can be used as a surrogate for PTE. Therefore, while the below responses are based on available information regarding PXE, the responses group the two compounds together as diphenylethanes.

(at least 50%) of the Semet pond residues. The two primary diphenylethanes are 1-phenyl-1-(4-methylphenyl)-ethane, or phenyl toluyl ethane (PTE), and 1-phenyl-1-(2,4-dimethylphenyl)-ethane, or phenyl xylyl ethane (PXE).

The commenter also noted that the Public Health Assessment for Onondaga Lake (New York State Department of Health, 1995; p. 24) states: "[Diphenylethanes] have been detected in fish, sediment and water. The concentrations of these compounds and their toxicological significance are not known. A potential source of these compounds is the tar beds." The Public Health Assessment goes on to make the recommendation: "Additional investigations should address the magnitude of contamination by and the toxicological significance of 1-phenyl-1-(4-methylphenyl)-ethane, and 1-phenyl-1-(2,4-dimethylphenyl)-ethane."

Response #41: The magnitude of contamination of Onondaga Lake fish, sediment, and surface water with diphenylethane and its toxicological impacts are being evaluated as part of the Onondaga Lake Bottom RI/FS.

Comment #42: A commenter stated that diphenylethane has not been commercially produced anywhere in the world; it is strictly an unintended by-product of the acid washing of coke light oil during the production of benzene, toluene, naphthalene, and xylene. Consequently, it must be recognized that even the most basic knowledge surrounding the physical and chemical properties of these compounds simply does not exist.

Response #42: Diphenylethane has been and is currently manufactured commercially. For example, diphenylethane has been produced as a dieletric fluid in capacitors, and was a replacement for PCBs when PCBs were banned in the early 1970s.

Comment #43: A commenter expressed concern that since driveways can reach extreme temperatures in the summer, diphenylethane might volatilize and it might pose a fire hazard.

Response #43: Volatility is measured by the vapor pressure of the compound. The higher the vapor pressure the more volatile the compound. Diphenylethane has a vapor pressure of 0.01 mm of Hg at 25EC, which is less than that of naphthalene (1.0 mm at 20EC) and similar to fluoranthene (0.01 mm at 20EC). This suggests that

diphenylethane would not be more volatile than other compounds present in the RT-12 products.

Fire hazard is quantified by the Flash Point and Autoignition Points. The Flash Point for diphenylethane is 293EF, which is higher than that of naphthalene (190EF). The autoignition point for diphenylethane is 707EF, which is of the same order as naphthalene (979EF). This suggest that the diphenylethane would not cause the Heritage RT-12 to be any more flammable than other manufacturers' RT-12 products.

Comment #44: A commenter asked whether, when exposed to sunlight, do PXE and PTE undergo photochemical reactions?

Response #44: Based on a review of the MSDS sheets for PXE and the results of a document search, it is believed that when exposed to sunlight, PXE and PTE would not react significantly different than the other hydrocarbon compounds found in petroleum products and RT-12.

Comment #45: A commenter expressed concern about the solubility of diphenylethane in water in that rainwater landing on the driveways could carry away soluble chemical components.

Response #45: Diphenylethane has a solubility limit of 10 milligrams per liter (mg/L). Naphthalene and fluoranthene have solubility limits of 31 mg/l and 0.2 mg/l, respectively. Therefore, the solubility of diphenylethane is within the range of other typical compounds present in RT-12 products that are commercially available.

Comment #46: A commenter asked what is the immediate (acute) toxicity of diphenylethane and what is the long-term (chronic) toxicity of PXE and PTE, including their ability to cause cancer, asthma, neurological problems, immuno-suppression, reproductive impairments, etc.?

Response #46: According to the NYSDOH, there is very little information on the health effects from exposure to PXE and PTE. According to information from the manufacturer, prolonged or repeated contact with PXE may cause irritation of the skin, and excessive breathing of PXE vapors may be moderately irritating to the eyes and mucous membranes. Based on studies in animals, PXE and PTE are not

expected to be highly toxic on a short-term basis. Laboratory animals exposed to high levels of PXE and PTE over short periods of time had effects on the central nervous system and liver. These effects are consistent with the known health effects of chemicals similar to PXE and PTE (such as other alkylated benzene derivatives). Studies that evaluate the health effects resulting from long-term exposure to PXE and PTE are not available. Based on similarities in chemical structure and analogies to chemicals that have been more extensively studied, we do not expect the toxicity of PXE and PTE to be greater than many of the other constituents in driveway sealants.

Comment #47: A commenter asked about the toxicological impact of diphenylethane on wildlife and plants.

Response #47: A review of the MSDS sheets for PXE and the results of a document search suggests that there would be little toxicological impacts on wildlife and plants from diphenylethane, especially when compared to other compounds present in commercially available RT-12.

Comment #48: A commenter asked about the propensity of diphenylethane to bioaccumulate.

Response #48: According to Hassett[6], these compounds are found in sediment, surface water, and fish in Onondaga Lake. While PXE and PTE are widespread in the sediments of Onondaga Lake, according to Dr. Hassett[7], the concentrations in the fish are low. The ratios of PXE and PTE concentrations in fish compared to the sediment concentrations would suggest that PXE and PTE bioaccumulate to a much lesser degree than other organic contaminants, such as PCBs.

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6 Hassett , J.P. February 1994. Sources of Organic Contaminants to Onondaga Lake, Progress Report. Chemistry Department , SUNY College of Environmental Science and Forestry, Syracuse, NY.

7 Personal communication between Dr. Hassett and Bob Montione, NYSDOH, date unknown.

APPENDIX V-a

LETTERS SUBMITTED DURING THE PUBLIC COMMENT PERIOD

1. Mr. Samuel H. Sage, President, Atlantic States Legal Foundation (February 13, 2002 - *via* electronic mail)
2. Mr. Kevin C. Murphy, General Counsel for Onondaga County (February 15, 2002)
3. Mr. Les Monostory, V.P., The Izaak Walton League of America, Central New York Chapter (February 15, 2002)
4. Mr. Joseph J. Heath, Esq., General Counsel for the Onondaga Nation and their Council of Chiefs (February 16, 2002 - *via* electronic mail)
5. Mr. Joseph J. Heath, Esq., General Counsel for the Onondaga Nation and their Council of Chiefs (February 22, 2002)
6. Mr. Larry Haun, Liverpool, NY (February 7, 2002)
7. Ms. Barbara S. Rivette, Onondaga County Health Department (March 4, 2002)
8. Mr. Samuel H. Sage, President, Atlantic States Legal Foundation (March 20, 2002)
9. Ms. Martha H. Loew, Chair, Iroquois Group of the Sierra Club (March 20, 2002 - *via* electronic mail)
10. Mr. Alfred J. Labuz, Manager, Remediation and Evaluation Services, Honeywell International, Inc. (March 20, 2002)

APPENDIX V-b

TRANSCRIPT OF THE PUBLIC MEETING FOR THE PROPOSED PLAN