RECORD OF DECISION &
RECORD OF DECISION AMENDMENT

C&D Power Systems (C&D Batteries)
State Superfund Project/RCRA Project
Deer Park, Orange County
Site No. 336001
EPA ID #NYD064337298
March 2015

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

DECLARATION STATEMENT - RECORD OF DECISION & RECORD OF DECISION AMENDMENT

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Statement of Purpose and Basis

This Record of Decision and Record of Decision Amendment presents the remedy for the C&D Power Systems (C&D Batteries) site, a Class 2 inactive hazardous waste disposal site. The remedial program was chosen in accordance with the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 373 (RCRA) and 375 (State Superfund), and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended. This is a Toxic Substance Control Act (TSCA) risk based cleanup in accordance with 40 CFR 761.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the C&D Power Systems (C&D Batteries) site and the public's input to the proposed remedy and proposed record of decision amendment presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Description of Selected Remedy

This remedy addresses both operable unit (OU) 01 and OU 02 and replaces the March 2002 Record of Decision (ROD) issued for OU 01. Upon issuance of the Record of Decision, OU 01 and OU 02 will be combined into a single operable unit.

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Re-sampling of the groundwater to confirm past sampling data and re-evaluation of the wells in the area will be conducted as part of the remedial design program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering Green and healthy communities and working landscapes with balanced ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

Lagoon: Excavation and off-site disposal of contaminated lagoon soils to a depth of 4 to 6 feet below the lagoon floor (19 to 21 feet below surrounding grade (bsg)). It is estimated that approximately 1,600 cubic yards of contaminated lagoon soil will be excavated and transported to an off-site TSCA and/or RCRA-permitted disposal facility for treatment and/or disposal. The excavation of lagoon soils to a depth up to six feet (21 feet bsg) will address all PCB concentrations that exceed 50 parts per million (ppm). All soils that contain PCB concentrations above 50 parts per million (ppm) will be disposed off-site as hazardous waste. Excavated soils that contain PCB concentrations above 1,000 parts per million (ppm) will be transported to an approved facility for incineration. Excavated soils that contain PCB concentrations above 500 ppm and below 1,000 ppm that are also a characteristic hazardous waste for metals toxicity will be stabilized on-site and transported to an approved facility for disposal.

On-site Soil: All on-site soils and sub-pavement soils containing lead concentrations greater than the Part 375 commercial SCO of 1,000 ppm will be excavated and stabilized for use as backfill in the lagoon as described in remedy element 4. The areas of on-site excavation are shown on Figure 2. It is estimated that approximately 600 cubic yards of soil and 2,500 cubic yards of sub-pavement soil will be excavated.

Off-site Soil: All areas of off-site soil containing lead concentrations greater than Part 375 residential SCO of 400 ppm will be excavated and stabilized for use as backfill in the lagoon as described in remedy element 4. It is estimated that approximately 325 cubic yards of off-site soil will be excavated from the area shown on Figure 2.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) for commercial use on-site and residential use off-site will be brought in to complete the backfilling of the excavations, lagoon and establish the designed grades at the site to accommodate installation of the cover system described in remedy element 5. Off-site areas will be restored to pre-existing grades.

3. In-Situ Solidification

In-situ solidification (ISS) will be implemented for the on-site lagoon, as indicated on Figure 2. The treatment zone will extend from the bottom of the excavation as described in remedy element 2 (approximately 19 to 21 feet bsg) to the groundwater table, at approximately 28 feet bsg and from the groundwater table to approximately 35 feet bsg in an area where the cadmium toxicity characteristic leaching procedure (TCLP) regulatory limit is exceeded. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

4. Ex-Situ Stabilization; On-site disposal

Ex-situ stabilization will be implemented to treat the lead contaminated soil excavated from on- and off-site as described in remedy element 2. Ex-situ stabilization is a process that mixes agents with contaminated soil to chemically modify the material to allow it to meet remedial goals, allowing it to be placed back on-site. Under this process the excavated contaminated soil (approximately 3,425 cubic yards) will be mixed in a temporary mixing facility (i.e., pug mill, mixer, etc.) with stabilizing agents (i.e., Enviroblend or an equivalent product) to address lead contamination. The treated soil will then be used as backfill in the lagoon and covered with a site cover to prevent direct exposure.

5. Site Cover

A site cover will be required to allow for commercial use of the site. The site will be restored to existing grade and the cover will consist of either structures such as buildings, pavement, sidewalks comprising any site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil meeting the soil cleanup objectives (SCOs) for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Where the soil cover is required over the on-site ISS treatment area, it will consist of a minimum of four feet of soil meeting the SCOs for commercial use. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

6. Sediment Removal

Contaminated stream sediment will be removed from tributary D-1-7 to a depth of 12 inches along approximately 1,132 linear feet of stream bed as shown on Figure 2. Approximately, 2,270 cubic yards of sediment will be removed. The removal of sediment to a depth of 12 inches would achieve SCGs for protection of the environment and would be expected to meet residential SCOs. The sediment will be place in the lagoon above the stabilized soils, below the cover system.

The stream will be excavated by diverting or pumping the stream around the contaminated area. Excavated sediments will be replaced with an appropriate substrate and the area restored to pre-excavation contours. Disturbed stream, stream bank and adjacent area vegetation will be re-established by planting and seeding. The restoration of the riverbed will meet the substantive requirements of 6 NYCRR Part 608 Use and Protection of Waters.

Prior to sediment removal, an assessment of the biota and plant communities in the area, including an assessment of the presence of mussels in the disturbed areas will be performed. If mussels are found in the remediation areas or adjacent areas, measures will be taken to limit the deleterious effects of the remedial action.

Following sediment removal, monitoring of restoration success with replacement of failed vegetation and post-removal monitoring of contaminants will be performed.

7. Institutional Controls

Imposition of an institutional control in the form of an environmental easement for the controlled property that:

a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);

b. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and

d. requires compliance with the Department approved Site Management Plan.

8. Site Management Plan

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

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

Institutional Controls: The Environmental Easement discussed in element 7.

Engineering Controls: The solidified mass and site cover discussed in elements 2 and 4.

This plan includes, but may not be limited to:

• an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

• descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions;

• a provision for further delineation of the nature and extent of contamination under the building when the building is demolished and for removal or treatment of any identified source area located under the building if and when the building is demolished;

• a provision for implementing actions recommended to address well contamination if identified;

• provisions for the management and inspection of the identified engineering controls;

• maintaining site access controls and Department notification; and

• the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

• monitoring of groundwater to assess the performance and effectiveness of the remedy;

• monitoring for site-related groundwater contamination for any off-site private wells, as may be required; and

• a schedule of monitoring and frequency of submittals to the Department.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

March 26, 2015	
Date	Robert W. Schick, P.E., Director Division of Environmental Remediation

RECORD OF DECISION &
RECORD OF DECISION AMENDMENT

C&D Power Systems (C&D Batteries)
Deer Park, Orange County
Site No. 336001
EPA ID#NYD064337298
March 2015

SECTION 1: SUMMARY AND PURPOSE OF THE RECORD OF DECISION AND RECORD OF DECISION AMENDMENT

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy. The disposal or release of hazardous wastes at this site, as more fully described in this document, has contaminated various environmental media. The remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This Record of Decision (ROD) and ROD Amendment identifies the selected remedy, summarizes the other alternatives considered, and discusses the reasons for selecting the remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment. The New York State Hazardous Waste Management Program (also known as the RCRA Program) requires corrective action for releases of hazardous waste and hazardous constituents to the environment. The Toxic Substance Control Act (TSCA) governs the management of polychlorinated biphenyls (PCB) containing materials in the United States. This facility is subject to these three programs.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Parts 373 (RCRA) and 375 (State Superfund). This is a TSCA risk based cleanup in accordance with 40 CFR 761. This document serves as the Statement of Basis (SB) for the Corrective Action (CA). This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

On March 27, 2002, The New York State Department of Environmental Conservation (Department) signed a Record of Decision (ROD) which selected a remedy to clean up the C&D Power Systems Site Operable Unit (OU) Number 01, the unsaturated lagoon soils, The ROD

outlined a set of remedial actions for the site that included excavation and disposal of the top six to eight feet (21 feet to 23 feet below surrounding grade (bsg)) of the contaminated lagoon soil and ex-situ stabilization of the remaining contaminated unsaturated lagoon soil. Following the issuance of the ROD, investigations for OU 02 were completed. OU 02 consists of the saturated zone beneath the lagoon, tributary sediment, surface water, on- and off-site groundwater, and on- and off-site surface soil and sub-paved surface soils.

The remedial investigation for OU 02 identified constructability issues associated with the driving of sheet pile due to the site's geology and the need to combine OU 01 and OU 02 remedies due to the presence of contamination in saturated lagoon soils (i.e., below the groundwater table).

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all remedies. A public comment period was held, during which the public was encouraged to submit comment on the proposed remedy and proposed ROD amendment. All comments on the remedy received during the comment period were considered by the Department in selecting a remedy for the site. Site-related reports and documents were made available for review by the public at the following document repositories:

Port Jervis Library
138 Pike Street
Port Jervis, NY 12771
Phone: (845) 856-7313

Deerpark Town Hall
420 Rt. 209
Huguenot, NY 12746
Phone: (845) 856-5705

NYSDEC Region 3 Office
21 South Putt Corners Road
New Paltz, NY 12561
Phone: (845) 256-3018
Please call for an appointment

A public meeting was also conducted. At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) were presented along with a summary of the proposed remedy and ROD amendment. After the presentation, a question-and-answer period was held, during which verbal or written comments were accepted on the proposed remedy and ROD amendment.

Comments on the remedy received during the comment period are summarized and addressed in the Responsiveness Summary section of the ROD and ROD Amendment.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going

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

SECTION 3: SITE DESCRIPTION AND HISTORY

3.1: Operable Units

Operable Units (OU) 01 and 02 are the subject of this document

OU 01 consists of the unsaturated lagoon soils. OU 02 consists of the balance of the site and off-site media. Specifically, OU 02 includes the saturated zone beneath the lagoon, off-site sediment, off-site surface water, on- and off-site groundwater, and on- and off-site soil.

The amended remedy described in this document supersedes the Record of Decision (ROD) previously issued for OU 01. Upon issuance of the amended OU 01 and OU 02 Records of Decision, OU 01 and OU 02 will be combined into a single operable unit.

A site location map is attached as Figure 1.

3.2: Site Details

Location: The C and D Power Systems site is located in the Hamlet of Huguenot in the Town of Deerpark, Orange County. The site is located approximately four miles northeast of the City of Port Jervis.

Site Features: The main site features include a large industrial building formerly used for the manufacturing of batteries, which is currently unoccupied, and an approximately 175-foot diameter wastewater treatment lagoon located 75 feet northeast of the plant building. The depth of the lagoon is approximately 15 feet. The site drops off rapidly to the northeast. Tributary D-1-7 to the Neversink River is located to the east/northeast and is currently accessible. The aquatic habitat of Tributary D-1-7 is consistent with the aquatic habitat preferred by the dwarf wedge mussel, a federal and New York State endangered species, known to inhabit the Neversink River.

Current Zoning and Land Use: The site is currently inactive, and is zoned for commercial use. Manufacturing operations at the site ceased in 2006. The site is in the Neversink River Valley and is bordered on the west by Route 209 and on the east by tributary D-1-7 to the Neversink River. The surrounding parcels are currently used for a combination of residential and commercial uses.

Past Use of the Site: From 1959 to approximately 1970, the facility was owned and operated by the Empire Tube Company (ETC), a manufacturer of black and white picture tubes. Hydrofluoric acid was used in the manufacturing process to remove carbon and potassium silicate from the

inside of the tubes. During this period, industrial wastewater was discharged to a lagoon adjacent to the northeastern corner of the plant building. C&D Technologies Incorporated operated at the facility manufacturing industrial lead batteries from the mid-1970s to 2006. From the mid-1970s until approximately 1982, C&D discharged non-contact cooling water into the lagoon.

The facility was formerly permitted to operate as a treatment, storage and/or disposal (TSDF) facility under the Resource Conservation and Recovery Act (RCRA) hazardous waste management program. The site has been included in the USEPA's tracking system under GPRA (Government Performance and Results Act) for corrective action. The RCRA Corrective Action Program requires investigation and cleanup of releases of hazardous wastes and hazardous constituents that pose an unacceptable risk at RCRA hazardous waste treatment, storage and disposal facilities. This site has not yet met indicators to show compliance with RCRA Corrective Action.

Operable Units: The site was divided into two operable units. An operable unit represents a portion of a remedial program for a site that for technical or administrative reasons can be addressed separately to investigate, eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable unit (OU) 01 consists of the unsaturated lagoon soils. OU 02 consists of the saturated zone beneath the lagoon, off-site tributary sediment, surface water, on- and off-site groundwater, on- and off-site soil.

The Record of Decision (ROD) for OU 01 was issued in March 2002. Because the selected remedy for OU 01 included removal of the unsaturated lagoon soils, ex-situ stabilization of the soils with disposal back into the lagoon, it was necessary to complete the investigation and remedy selection for OU 02 prior to implementing the OU 01 remedy.

Site Geology and Hydrogeology: The site and surrounding area is underlain by glacially deposited sand and gravel that gets coarser with depth. The irregular thickness of the deposit ranges from less than 10 feet to approximately 150 feet. Depth to groundwater is approximately 30 feet below ground surface. Groundwater flows southeast towards the unnamed tributary to the Neversink River which lies east of the site.

SECTION 4: LAND USE AND PHYSICAL SETTING

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

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

SECTION 5: ENFORCEMENT STATUS

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

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

C&D Technologies Inc.

The Department and C and D Technologies Inc. entered into a Consent Order on July 19, 1999. The Order obligates the responsible parties to implement a remedial investigation (RI)/feasibility study (FS)-only remedial program. After the remedy is determined, the Department will approach the PRPs to enter another consent order with the Department to implement the remedy.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

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

The following general activities are conducted during an RI:

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

The analytical data collected on this site includes data for:

- groundwater
- surface water
- soil
- sediment

6.1.1: Standards, Criteria, and Guidance (SCGs)

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

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

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

6.1.2: RI Results

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

barium	lead
cadmium	PCB-aroclor 1254
fluoride	

As illustrated in Exhibit A, the contaminants of concern exceed the applicable SCGs for:

- groundwater
- soil
- sediment

6.2: Interim Remedial Measures

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

There were no IRMs performed at this site during the RI.

In 1998, the facility completed closure, in accordance with USEPA RCRA requirements, of a 90,000 gallon settling tank and a 6,800 gallon neutralization tank. The following closure activities took place in October 2006:

- Power washing and removal of equipment;
- Power washing of building walls and floors;
- Decontamination of building roof equipment;
- Cleanup of the interior offices, the maintenance room and outside area; and
- Segregation and removal off-site of non-hazardous and hazardous materials and wastes.

6.3: Summary of Environmental Assessment

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

The Fish and Wildlife Resources Impact Analysis (FWRIA) for OU 02, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

Nature and Extent of Contamination:

The goal of a remedial investigation is to determine the nature and extent of contamination. Therefore, the investigation included sampling and analysis for the full target compound list/target analyte list. No volatile organic compounds or semi-volatile organic compounds were detected above applicable standards. Metals and polychlorinated biphenyls were detected above applicable standards and identified as the contaminants of concern for this site.

For OU 01: Unsaturated Lagoon Soils

The primary contaminants of concern for OU 01 include barium, cadmium, fluoride, polychlorinated biphenyls (PCBs) and lead.

Lagoon Soil – PCBs were detected in the top foot of lagoon soils up to 1,100 parts per million (ppm) (unrestricted use SCO of 0.1 ppm; commercial use SCO of 1 ppm).

The following metals were detected throughout the unsaturated lagoon soils, to a depth of 27 feet below surrounding grade (bsg): cadmium up to 46,000 ppm (unrestricted use SCO of 2.5 ppm; commercial use SCO of 9.3 ppm), lead up to 13,000 ppm (unrestricted use SCO of 63 ppm; commercial use SCO of 1,000 ppm) and barium up 7,710 ppm (unrestricted use SCO of 350 ppm; commercial use SCO of 400 ppm).

Fluoride was consistently detected in the unsaturated lagoon soils at concentrations up to 327 ppm, above background levels (less than 10.42 ppm).

For OU 02: Saturated zone beneath lagoon, tributary sediment, surface water, on- and off-site groundwater, on- and off-site soil.

The primary contaminants of concern for OU 02 include cadmium, fluoride, PCBs and lead.

Lagoon Soil Below Groundwater - Cadmium was detected up to 402 ppm (unrestricted use SCO of 2.5 ppm; commercial use SCO of 9.3 ppm) and barium was detected up to 1,370 ppm (unrestricted use SCO of 350 ppm; commercial use SCO of 400 ppm) in saturated lagoon soil. Cadmium concentrations were detected up to 1.94 ppm above the Toxicity Characteristic Leaching Procedure (TCLP) regulatory limit (1 ppm) in the saturated lagoon soil to a depth of 35 feet bsg. Exceedances of the TCLP regulatory limit for cadmium were limited to two areas of the lagoon

(northeast and southwest portion). All other areas of the lagoon exhibited barium, cadmium and lead concentrations below the respective TCLP regulatory limits in the saturated lagoon soil.

Soil Outside Lagoon– Surface soils and soil currently covered with pavement on-site, located east and south of the main building, are contaminated with lead up to 58,600 ppm above the unrestricted (63 ppm) and commercial (1,000 ppm) SCOs to a depth of approximately one foot. Off-site surface soils located southeast of the main building, are contaminated with lead up to 2,040 ppm above the unrestricted (63 ppm) and residential (400 ppm) SCOs to a depth of approximately one foot.

Groundwater – Groundwater both on- and off-site has been impacted by fluoride. The highest concentrations of fluoride in groundwater have been detected in the vicinity of the former lagoon. On-site, fluoride was detected in groundwater up to 10,400 parts per billion (ppb), above the standard of 1,500 ppb. Off-site impacts are limited; however, fluoride was detected up to 2,120 ppb, above the standard of 1,500 ppb, in one off-site groundwater monitoring well. Fluoride was not detected above the standard of 1,500 ppb in the off-site groundwater monitoring well located approximately 1,200 feet downgradient of the lagoon center. This off-site groundwater monitoring well is located downgradient of the off-site well where fluoride was detected above the standard. Samples collected from the Harriet Space Park ladies restroom and from the Town of Deerpark Town Hall, which are both located south of the lagoon, also did not contain fluoride concentrations above the standard of 1,500 ppb. Fluoride was detected in exceedance of the drinking water standard in one off-site residential well in 2000, but subsequent samples found no contamination in exceedance of the standard.

Sediments - Off-site tributary sediments also have been impacted by lead, cadmium and PCBs in excess of the NYSDEC sediment quality criteria. Lead was detected up to 400 ppm above the lowest effects level (LEL) (31 ppm) and severe effects level (SEL) (110 ppm). Lead concentrations above the SEL are primarily limited to the top six inches of sediment. Cadmium was detected up to 3.7 ppm above the LEL (0.6 ppm). Cadmium concentrations above the LEL are limited to the top six inches of sediment. PCBs were detected up to 1.470 ppm in the top twelve inches of sediment above the human health bioaccumulation sediment criteria value (0.000018 ppm) and wildlife bioaccumulation sediment criteria value (0.0315 ppm).

Surface Water – Surface water has not been impacted by site-related contamination. All concentrations of site-related contamination identified (lead (10.4 ppb); barium (16.7 ppb); and fluoride (360 ppb)) were below their NYSDEC water quality standards ((50 ppb); (1,000 ppb); and (1,500 ppb), respectively).

6.4: Summary of Human Exposure Pathways

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

The former lagoon is fenced to restrict access, but the rest of the site is unrestricted. Persons who enter the site could contact contaminants in the soil by walking on the soil, digging, or otherwise disturbing the soil. Contaminated groundwater at the site is not used for drinking water; however,

private drinking water wells are in use near the site. It is unknown if these wells are affected by the site related contamination in groundwater. People may come in contact with contaminants present in the shallow tributary sediments while entering or exiting the tributary during recreational activities.

SECTION 7: SUMMARY OF ORIGINAL REMEDY AND ROD AMENDMENT

7.1.1: Original Remedy for OU 01

In the March 2002 ROD for OU 01 the NYSDEC selected partial excavation and ex-situ stabilization. The components of the original remedy were as follows:

- A remedial design program, including bench scale and pilot study programs, to provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program;

- Excavation of lagoon soil to a depth of six to eight feet (21 to 23 feet bsg), and transportation to an off-site TSCA/RCRA disposal facility for treatment and disposal. Excavation of remaining unsaturated lagoon soil to a depth of 14 feet (29 feet bsg) or groundwater table, whichever is encountered first, and on-site stabilization. Placement of several feet of clean fill in the lagoon excavation to provide a buffer from the fluctuations in the groundwater. Replacement of stabilized soils back into the lagoon excavation, backfill with clean fill to the existing grade of the surrounding areas, and installation of a geomembrane liner/asphalt cover.

- Semi-annual sampling of on-site monitoring wells to be conducted as part of a long-term monitoring program to monitor the effectiveness of the on-site stabilization;

- Institutional controls in the form of deed restrictions to be recorded in the chain of title of the property to restrict the future use of the former lagoon area to industrial use only, mandate the maintenance of the cap, and require notification to the NYSDEC when excavation of the capped area is planned; and

- Annual certification by the property owner that the site is in compliance with the institutional controls outlined in this ROD.

7.1.2: Elements of the OU 01 Remedy Already Performed

No elements of the OU 01 remedy have been performed to date. Because the selected remedy included removal of the unsaturated lagoon soils, ex-situ stabilization of the soils with disposal back into the lagoon, it was necessary to complete the investigation and remedy selection for the saturated lagoon soils (OU 02) prior to implementing the OU 01 remedy.

7.1.3: New Information

Since the issuance of the FS and ROD, new information about the site has been obtained. It was determined during the OU 02 remedial investigation that the feasibility of installing the sheet piling system, required to stabilize the adjacent building foundation and allow excavation of the unsaturated lagoon soils, would need to be installed to a substantially greater depth due to the loose nature of the on-site soil.

In addition, cadmium contamination, which failed the toxicity characteristic leaching procedure (TCLP), was also found in an area of the saturated zone of the lagoon to a depth of 35 feet bsg. The TCLP failure means the contamination is a characteristic hazardous waste, which would require a much deeper excavation and associated sheet pile support to address this material in accordance with the original remedy.

7.1.4: Selected Change to the Original Remedy

Based on the new information identified above and the identified need to coordinate the remedies for both operable units of the site as it relates to the lagoon area, the original remedy for the unsaturated lagoon soil will no longer be implemented. The OU 01 ROD Amendment will be combined with the OU 02 remedy and the selected remedy will encompass all lagoon soil. This ROD presents the evaluation and identification of a combined OU 01 and 02 selected remedy in the sections to follow.

7.2: Summary of the Remediation Objectives

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

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

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

Sediment

RAOs for Public Health Protection

- Prevent direct contact with contaminated sediments.

RAOs for Environmental Protection

- Prevent impacts to biota from ingestion/direct contact with sediments causing toxicity or impacts from bioaccumulation through the marine or aquatic food chain.

7.3: SUMMARY OF THE SELECTED OU 01 and 02 REMEDY

To be selected the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 7.2. Potential remedial alternatives for the Site were identified, screened and evaluated in the feasibility study (FS) report.

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

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

The selected remedy addresses both OU 01 and OU 02 and replaces the March 2002 Record of Decision (ROD) issued for OU 01. Upon issuance of the Record of Decision, OU 01 and OU 02 will be combined into a single operable unit.

The selected remedy is referred to as the excavation and solidification with private well sampling, sediment removal and long-term monitoring remedy.

The estimated present worth cost to implement the remedy is $5,998,000. The cost to construct the remedy is estimated to be $5,375,000 and the estimated average annual cost is $40,000.

The elements of the selected remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Re-sampling of the groundwater to confirm past sampling data and re-evaluation of the wells in the area will be conducted as part of the remedial design program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gas and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering Green and healthy communities and working landscapes with balanced ecological, economic and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

Lagoon: Excavation and off-site disposal of contaminated lagoon soils to a depth of 4 to 6 feet below the lagoon floor (19 to 21 feet below surrounding grade (bsg)). It is estimated that approximately 1,600 cubic yards of contaminated lagoon soil will be excavated and transported to an off-site TSCA and/or RCRA-permitted disposal facility for treatment and/or disposal. The excavation of lagoon soils to a depth up to six feet (21 feet bsg) will address all PCB concentrations that exceed 50 parts per million (ppm). All soils that contain PCB concentrations above 50 parts per million (ppm) will be disposed off-site as hazardous waste. Excavated soils that contain PCB concentrations above 1,000 parts per million (ppm) will be transported to an approved facility for incineration. Excavated soils that contain PCB concentrations above 500 ppm and below 1,000 ppm that are also a characteristic hazardous waste for metals toxicity will be stabilized on-site and transported to an approved facility for disposal.

On-site Soil: All on-site soils and sub-pavement soils containing lead concentrations greater than the Part 375 commercial SCO of 1,000 ppm will be excavated and stabilized for use as backfill in the lagoon as described in remedy element 4. The areas of on-site excavation are shown on Figure 2. It is estimated that approximately 600 cubic yards of soil and 2,500 cubic yards of sub-pavement soil will be excavated.

Off-site Soil: All areas of off-site soil containing lead concentrations greater than Part 375 residential SCO of 400 ppm will be excavated and stabilized for use as backfill in the lagoon as described in remedy element 4. It is estimated that approximately 325 cubic yards of off-site soil will be excavated from the area shown on Figure 2.

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) for commercial use on-site and residential use off-site will be brought in to complete the backfilling of the excavations, lagoon and establish the designed grades at the site to accommodate installation of the cover system described in remedy element 5. Off-site areas will be restored to pre-existing grades.

3. In-Situ Solidification

In-situ solidification (ISS) will be implemented for the on-site lagoon, as indicated on Figure 2. The treatment zone will extend from the bottom of the excavation as described in remedy element 2 (approximately 19 to 21 feet bsg) to the groundwater table, at approximately 28 feet bsg and from the groundwater table to approximately 35 feet bsg in an area where the cadmium toxicity characteristic leaching procedure (TCLP) regulatory limit is exceeded. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

4. Ex-Situ Stabilization; On-site disposal

Ex-situ stabilization will be implemented to treat the lead contaminated soil excavated from on- and off-site as described in remedy element 2. Ex-situ stabilization is a process that mixes agents with contaminated soil to chemically modify the material to allow it to meet remedial goals, allowing it to be placed back on-site. Under this process the excavated contaminated soil (approximately 3,425 cubic yards) will be mixed in a temporary mixing facility (i.e., pug mill, mixer, etc.) with stabilizing agents (i.e., Enviroblend or an equivalent product) to address lead contamination. The treated soil will then be used as backfill in the lagoon and covered with a site cover to prevent direct exposure.

5. Site Cover

A site cover will be required to allow for commercial use of the site. The site will be restored to existing grade and the cover will consist of either structures such as buildings, pavement, sidewalks comprising any site development or a soil cover in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where the soil cover is required it will be a minimum of one foot of soil meeting the soil cleanup objectives (SCOs) for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficient quality to maintain a vegetation layer. Where the soil cover is required over the on-site ISS treatment area, it will consist of a minimum of four feet of soil meeting the SCOs for commercial use. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

6. Sediment Removal

Contaminated stream sediment will be removed from tributary D-1-7 to a depth of 12 inches along approximately 1,132 linear feet of stream bed as shown on Figure 2. Approximately, 2,270 cubic yards of sediment will be removed. The removal of sediment to a depth of 12 inches would achieve SCGs for protection of the environment and would be expected to meet residential SCOs. The sediment will be place in the lagoon above the stabilized soils, below the cover system.

The stream will be excavated by diverting or pumping the stream around the contaminated area. Excavated sediments will be replaced with an appropriate substrate and the area restored to pre-excavation contours. Disturbed stream, stream bank and adjacent area vegetation will be re-established by planting and seeding. The restoration of the riverbed will meet the substantive requirements of 6 NYCRR Part 608 Use and Protection of Waters.

Prior to sediment removal, an assessment of the biota and plant communities in the area, including an assessment of the presence of mussels in the disturbed areas will be performed. If mussels are found in the remediation areas or adjacent areas, measures will be taken to limit the deleterious effects of the remedial action.

Following sediment removal, monitoring of restoration success with replacement of failed vegetation and post-removal monitoring of contaminants will be performed.

7. Institutional Controls

Imposition of an institutional control in the form of an environmental easement for the controlled property that:

a. requires the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8(h)(3);

b. allows the use and development of the controlled property for commercial and industrial uses as defined by Part 375-1.8(g), although land use is subject to local zoning laws;

c. restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and

d. requires compliance with the Department approved Site Management Plan.

8. Site Management Plan

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

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

Institutional Controls: The Environmental Easement discussed in element 7.

Engineering Controls: The solidified mass and site cover discussed in elements 2 and 4.

This plan includes, but may not be limited to:

• an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;

• descriptions of the provisions of the environmental easement including any land use and/or groundwater use restrictions;

• a provision for further delineation of the nature and extent of contamination under the building when the building is demolished and for removal or treatment of any identified source area located under the building if and when the building is demolished;

• a provision for implementing actions recommended to address well contamination if identified;

• provisions for the management and inspection of the identified engineering controls;

• maintaining site access controls and Department notification; and

• the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

• monitoring of groundwater to assess the performance and effectiveness of the remedy;

• monitoring for site-related groundwater contamination for any off-site private wells, as may be required; and

• a schedule of monitoring and frequency of submittals to the Department.

Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination. Samples were initially analyzed for full target compound list/target analyte list. Based on historic use and contaminants detected, sampling was then reduced to contaminants of concern.

For each medium, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into two categories; polychlorinated biphenyls (PCBs), and inorganics (metals). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 6.1.1 are also presented.

Groundwater

Groundwater samples were collected from overburden monitoring wells. The samples were collected to assess groundwater conditions on- and off-site. The results indicate that contamination in overburden groundwater at the site exceed the SCGs for inorganics and PCBs. Contaminant levels in downgradient groundwater samples exceed the SCGs for fluoride; however, the downgradient impact is limited in extent. The only known downgradient private well in the vicinity of the site was found to be impacted with fluoride, however subsequent samples of this well found no contamination above the drinking water standards.

Table 1 - Groundwater

Detected Constituents		Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Inorganics	Fluoride	ND – 10,900	1,500	24 of 40
	Barium	ND – 1,420	1,000	1 of 42
	Cadmium	ND – 42.2	5	2 of 44
	Lead	ND – 29.4	25	1 of 40
PCBs	Aroclor 1254	ND – 0.31	0.09	6 of 50

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

The primary groundwater contaminant is fluoride associated with former manufacturing operations at the site. As noted on Figure 3, the primary groundwater contamination is associated with the former lagoon located northeast of the plant building.

Based on the findings of the RI, the past disposal of hazardous waste has resulted in the contamination of groundwater. The site contaminant that is considered to be the primary contaminant of concern which will drive the remediation of groundwater to be addressed by the remedy selection process is: fluoride.

Soil

During the RI, soil samples were collected from the former lagoon surface (15 feet below surrounding grade (bsg)) and at various depths above and within the groundwater table. The groundwater table is located approximately 14 feet below the lagoon soil surface (29 feet bsg). Samples were also collected from on- and off-site surface soil and soil currently covered with pavement. The results indicate that lagoon soil exceeds the commercial and groundwater protection soil cleanup objectives (SCOs) for metals (i.e. lead, cadmium, and barium) and PCBs (Aroclor 1254) and surface soil and soil currently covered with pavement east and south of the main buildings are contaminated with lead above the residential and commercial SCOs. Fluoride, present in saturated lagoon soil, is likely the source of the groundwater contamination plume. However, there is no SCO for fluoride in soil.

Table 2 – Lagoon Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Restricted Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Inorganics					
Lead	ND – 13,000	63	54/87	450[d]	32/87
Cadmium	ND – 46,000	2.5	47/56	7.5[d]	40/56
Barium	18.5 – 7,710	350	63/81	400	60/81
Fluoride	ND - 327	N/A[e]	N/A	N/A	N/A
Pesticides/PCBs					
Aroclor 1254	ND – 1,100	0.1	31/37	1	31/37

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.
d - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Groundwater.
e – SCG is not available

Table 3 – Surface and Sub-Pavement Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Residential Use SCG[b] (ppm)	Frequency Exceeding Residential Use SCG	Commercial Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
Inorganics					
Lead	14.3 – 58,600	400	56/109	450[d]	54/109

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

The primary soil contaminants are PCBs and metals including lead, fluoride, cadmium and barium associated with the past discharge of industrial wastewater into the lagoon at the site as noted on Figures 4 through 7.

Surface soil and sub-paved surface soil east and south of the main buildings were found to be contaminated with lead above the Protection of Public Health SCO for a residential and commercial property, respectively as shown on Figure 8. The lead contamination is from historical manufacturing operations at the site.

Based on the findings of the Remedial Investigation, the past disposal of hazardous waste has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are, PCBs, lead, fluoride, cadmium and barium.

Surface Water

Surface water samples were collected from tributary D-1-7 of the Neversink River during the RI. Six surface water samples were collected at locations upstream, adjacent and downstream of the site. PCBs and cadmium were not detected in any of the six surface water samples. Lead, barium and fluoride were detected in the surface water samples. However, all concentrations of lead, barium and fluoride detected in the surface water samples were below their NYSDEC water quality standards.

Table 4 – Surface Water

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
Inorganics			
Barium	8.2 – 16.7	1,000	0/6
Lead	ND – 10.4	50	0/6
Fluoride	ND - 360	1,500	0/6

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b - SCG: Ambient Water Quality Standards and Guidance Values (TOGS 1.1.1) and 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards.

No site-related surface water contamination of concern was identified during the RI. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

Sediment samples were collected during the RI at locations upstream, adjacent and downstream of the site along tributary D-1-7 of the Neversink River and from the flood plain adjacent to the main channel of the tributary. The samples were collected to assess the potential impacts to stream sediments from the site and were collected from 0-6 inches and 6-12 inches below the stream bed. The results indicate that sediment in the tributary of the Neversink River exceed the Department's SCGs for sediments for cadmium, lead and PCBs.

Table 5 - Sediment

Detected Constituents	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency Exceeding SCG
Inorganics			
Barium	15.6 – 137	NA	
Fluoride	ND – 53.9	NA	
Cadmium	ND – 3.7	LEL[c] – 0.6	12/48
		SEL[c] – 9	0/48
Lead	ND - 400	LEL[c] - 31	24/52
		SEL[c] - 110	7/52
PCBs			
Total PCBs	ND – 1.470	0.0000258[d]	30/48
		88.898[e]	0/48
		0.6215[f]	2/48
		0.04508[g]	23/48

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in sediment;
b - SCG: The Department's Technical Guidance for Screening Contaminated Sediments.
c- LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered contaminated if either of these criteria is exceeded. If the SEL criteria are exceeded, the sediment is severely impacted. If only the LEL is impacted, the impact is considered moderate.
d – Value is based on Human Health Bioaccumulation
e - Value is based on Benthic Aquatic Life Acute Toxicity
f - Value is based on Benthic Aquatic Life Chronic Toxicity
g - Value is based on Wildlife Bioaccumulation

The primary sediment contaminants are lead and PCBs, and to a lesser degree cadmium, associated with the historical discharge of industrial wastewater into the lagoon at the site. As noted on Figure 9, the primary sediment contamination is found between sediment sample locations SED-9 and SED-14.

Based on the findings of the Remedial Investigation, the disposal of hazardous waste has resulted in the contamination of sediment. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of sediment to be addressed by the remedy selection process are, lead, cadmium and PCBs.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A. The lagoon soil remedial action alternatives include the OU 01 portion of the lagoon soil.

Lagoon Soil Remedial Action Alternatives

Alternative LS-1: No Action

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

Alternative LS-2: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative includes: excavation and off-site disposal of all soil contamination above the unrestricted soil cleanup objectives. The total quantity of soil to be excavated and sent off-site for treatment or disposal is estimated to be 9,800 cubic yards. When excavation is complete, the excavated area of the lagoon would be backfilled to original grade using clean imported fill. Vegetated areas would receive a six inch layer of topsoil.

This alternative removes all contamination above unrestricted SCOs therefore no institutional controls would be necessary and no annual cost would be incurred.

Capital Cost: *$7,730,000*

Alternative LS-3: Excavation (Top 6 to 8 ft.), Disposal, Stabilization, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring

This alternative includes the excavation and off-site disposal of the top 6 to 8 feet of the lagoon soils to a Toxic Substances and Control Act/Resource Conservation Recovery Act (TSCA/RCRA) permitted facility. The total quantity of soil to be excavated and disposed off-site is estimated to be 2,320 cubic yards.

The remaining lagoon soils will be excavated to a depth of 28 feet below surrounding grade (bsg) or groundwater, whichever is encountered first, and stabilized on-site with trisodium phosphate to transform the metal constituents into insoluble metal phosphate compounds. Several feet of clean fill will be placed in the lagoon excavation to provide a buffer between the groundwater table and the treated soil that will be subsequently placed back into the lagoon. The excavated area will be backfilled with clean fill to the existing grade of the surrounding area and a geomembrane liner/asphalt cap will be installed over the area to prevent precipitation infiltration.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: *$3,606,000*
Capital Cost: *$3,384,000*
Annual Costs: *$14,000*

Alternative LS-4: Excavation and Disposal (Top 4 to 6 feet), Ex-Situ Stabilization of Unsaturated and Saturated Soils, Geomembrane/Asphalt Cap and Institutional Controls

This alternative includes the excavation and off-site disposal of the top 4 to 6 feet of the lagoon soils to a TSCA/RCRA permitted facility. The total quantity of soil to be excavated and disposed off-site is estimated to be 1,600 cubic yards.

The remaining impacted soil in the unsaturated zone will be excavated to a depth of 28 feet bsg or groundwater, whichever is encountered first, and stabilized on-site. In addition, soil below this level in areas where cadmium concentrations fail the TCLP test, currently estimated to be 35 feet bsg, will be excavated and stabilized on-site. The impacted lagoon soils will be stabilized on-site with trisodium phosphate or Portland cement to transform the metal constituents into insoluble metal phosphate compounds. Several feet of clean fill will be placed in the lagoon excavation to provide a buffer between the groundwater table and the treated soil that will be subsequently be placed back into the lagoon above the saturated zone. The excavated area will be backfilled with clean fill to the existing grade of the surrounding area and a geomembrane liner/asphalt cap will be installed over the area to prevent precipitation infiltration.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: *$3,801,000*
Capital Cost: *$3,579,000*
Annual Costs: *$14,000*

Alternative LS-5: Excavation and Disposal (Top 4 to 6 feet), In-Situ Solidification, Site Cover, Institutional Controls, and Long-Term Monitoring

This alternative includes the excavation and off-site disposal of the top 4 to 6 feet of the lagoon soils to a TSCA/RCRA permitted facility. The total quantity of soil to be excavated and disposed off-site is estimated to be 1,600 cubic yards.

The remaining impacted soils in the unsaturated zone (approximately 28 feet bsg) will be solidified in place using shallow mixing technology. In addition, solidification of soil below this level in areas where cadmium concentrations fail the TCLP test, currently estimated to be 35 feet bsg. Tri-sodium phosphate and/or Portland cement will be used to transform the metal constituents into insoluble metal phosphate compounds. The excavated area will be backfilled with clean fill to the existing grade of the surrounding area and an asphalt cap will be installed over the area to prevent precipitation infiltration.

This alternative includes institutional controls, in the form of an environmental easement and a site management plan, necessary to protect public health and the environment from any contamination identified at the site.

Present Worth: *$2,761,000*
Capital Cost: *$2,539,000*

Annual Costs: *$14,000*

Surface Soil Remedial Action Alternative

Alternative SS-1: No Action

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

Alternative SS-2: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives listed in Part 375-6.8 (a). This alternative includes: excavation and off-site disposal of all surface soil and sub-pavement soil contamination above the unrestricted soil cleanup objectives. The total quantity of soil to be excavated and sent off-site for disposal is estimated to be 10,530 cubic yards. When excavation is complete, excavation areas would be backfilled to original grade using clean imported fill. Vegetated areas would receive a six inch layer of topsoil.

This alternative removes all contamination above unrestricted SCOs therefore no institutional controls would be necessary and no annual cost would be incurred.

Capital Cost: *$7,252,000*

Alternative SS-3: Excavation, Ex-Situ Stabilization and On-Site Disposal

This alternative includes the excavation of impacted on- and off-site surface soils and sub-pavement soils, ex-situ stabilization and placement of the stabilized soils in the lagoon as backfill beneath the cover system.

It is estimated that approximately 325 cubic yards of soil with concentrations above the residential SCO and 600 cubic yards of surface soil and 2,500 cubic yards of sub-pavement soil above the commercial SCO would be excavated. When excavation is complete, excavation areas outside the pavement area will be backfilled to original grade using clean imported fill. Vegetated areas will receive a six inch layer of topsoil. Excavation areas within the pavement area will be re-paved. Asphalt paving removed during excavation will be disposed off-site or reused on-site as backfill in the lagoon below the cover system.

The excavated contaminated soil will be mixed with tri-sodium phosphate or an equivalent product to create insoluble metal phosphate compounds. The treated soil will then be used as backfill in the lagoon and covered with a cover system.

Present Worth: *$1,206,000*
Capital Cost: *$1,206,000*
Annual Costs: *$0*

Sediment Remedial Action Alternatives

Alternative SED-1: No Action

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

Alternative SED-2: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A. This alternative includes: removal and off-site disposal of contaminated sediment from Tributary D-1-7 with metal concentrations above the LEL and PCB concentrations above 1 mg/kg.

Removal of sediments will be conducted using conventional earth moving equipment. A cofferdam would be constructed upstream of the sediment removal areas and the stream flow pumped or diverted around the excavation areas. The total quantity of sediment to be removed and sent off-site for disposal is estimated to be 4,230 cubic yards.

The dredged areas will be backfilled to restore original bathymetry. The restoration of the riverbed will meet the substantive requirements of 6 NYCRR Part 608 Use and Protection of Waters.

This alternative removes all contamination above unrestricted SCOs therefore no institutional controls will be necessary and no annual cost will be incurred.

Capital Cost:.....$3,751,000

Alternative SED-3: Excavation/Dredging of Targeted Lead and PCB Impacted Sediment

This alternative includes the excavation of all stream bed sediments between sediment sample locations SED-9 and SED-14 to a depth of 12 inches in Tributary D-1-7. It is estimated that 64% of sediment with lead concentrations above the severe effects level (SEL), 63% of sediment with cadmium concentrations above the lower effects level (LEL) and all sediment where PCB concentrations exceed 1 mg/kg will be removed from the stream.

The total quantity of sediment to be removed is estimated to be 2,270 cubic yards. The sediment will be placed in the lagoon above the stabilized soils, below the cover system.

Removal of sediments will be conducted using conventional earth moving equipment. A cofferdam will be constructed upstream of the sediment removal areas and the stream will be dredged by diverting or pumping the stream around the contaminated area. Excavated sediments will be replaced with an appropriate substrate and the area restored to pre-excavation contours. Disturbed stream, stream bank and adjacent area vegetation will be re-established by planting and seeding. The restoration of the riverbed will meet the substantive requirements of 6 NYCRR Part 608 Use and Protection of Waters.

Prior to sediment removal an assessment of the biota and plant communities in the area, especially an assessment of potential mussels in removal areas will be performed. If mussels are found in the remediation areas or adjacent areas, measures will be taken to limit the deleterious effects of the remedial action.

Following sediment removal, monitoring of restoration success with replacement of failed vegetation and post-removal monitoring of contaminants will be performed.

Present Worth: *$1,707,000*
Capital Cost: *$1,630,000*
Annual Costs: *$5,000*

Alternative SED-4: Excavation/Removal of all Impacted Sediment and On-Site Disposal

This alternative includes the excavation of all sediments where the sediment metal concentrations are above the LEL and where PCB concentrations are above 1 mg/kg to a depth of 12 inches in Tributary D-1-7 and placement of the sediment in the lagoon as backfill.

Removal of sediments will be conducted using conventional earth moving equipment. A cofferdam would be constructed upstream of the sediment removal areas and the stream flow pumped or diverted around the excavation areas. The total quantity of sediment to be removed is estimated to be 4,230 cubic yards. The sediment will be placed in the lagoon above the stabilized soils, below the cover system.

The dredged areas will be backfilled to restore original bathymetry. The restoration of the riverbed will meet the substantive requirements of 6 NYCRR Part 608 Use and Protection of Waters.

Prior to sediment removal an assessment of the biota and plant communities in the area, especially an assessment of potential mussels in removal areas will be performed. If mussels are found in the remediation areas or adjacent areas, measures will be taken to limit the deleterious effects of the remedial action.

Following sediment removal, monitoring of restoration success with replacement of failed vegetation and post-removal monitoring of contaminants will be performed.

Present Worth: *$2,751,000*
Capital Cost: *$2,674,000*
Annual Costs: *$5,000*

Alternative SED-5: Excavation/Removal of Highest Lead and PCB Impacted Sediments

This alternative includes the excavation of sediment to a depth of 12 inches where PCB concentrations are above 1 mg/kg and where the highest lead concentrations were detected in Tributary D-1-7. It is estimated that 33% of the sediment with lead concentrations above the SEL and approximately 32% of sediment with cadmium concentrations above the LEL will be removed from the stream.

The total quantity of sediment to be excavated is estimated to be 813 cubic yards of sediment. The sediment will be placed in the lagoon above the stabilized soils, below the cover system.

The excavated sediment will be placed in the lagoon as backfill above the stabilized soils, below the cover system. Removal of sediments will be conducted using conventional earth moving equipment. A cofferdam will be

constructed upstream of the sediment removal areas and the stream will be dredged by diverting or pumping the stream around the contaminated area.

Excavated sediments will be replaced with an appropriate substrate and the area restored to pre-excavation contours. The dredged areas will be backfilled to the pre-existing contours using appropriate materials and the disturbed areas of the stream bank and adjacent area vegetation will be re-established. The restoration of the riverbed will meet the substantive requirements of 6 NYCRR Part 608 Use and Protection of Waters.

Prior to sediment removal an assessment of the biota and plant communities in the area, especially an assessment of potential mussels in removal areas will be performed. If mussels are found in the remediation areas or adjacent areas, measures will be taken to limit the deleterious effects of the remedial action.

Following sediment removal, monitoring of restoration success with replacement of failed vegetation and post-removal monitoring of contaminants will be performed.

Present Worth: *$1,253,000*
Capital Cost: *$1,176,000*
Annual Costs: *$5,000*

Groundwater Remedial Action Alternatives

Alternative GW-1: No Action

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

Alternative GW-2 Groundwater Control, Treatment and Long-Term Monitoring

This alternative includes groundwater treatment and long-term monitoring. Groundwater will be collected downgradient of the lagoon and will be treated with activated alumina for fluoride, and if necessary with precipitation for lead and cadmium and activated carbon for PCBs. The treated water will be discharged to Tributary D-1-7. The treatment system configuration will be determined during design.

A long-term groundwater monitoring program for all on-site and off-site monitoring wells will be established. Monitoring wells will be sampled semi-annually for fluoride, barium, cadmium, lead and PCBs.

Present Worth: *$4,999,000*
Capital Cost: *$1,049,000*
Annual Costs: *$257,000*

Alternative GW-3: Private Well Re-Sampling and Long-Term Monitoring

This alternative includes a re-evaluation of the potential for off-site private well supplies to be impacted by site-related contamination in groundwater, including a provision for implementing actions recommended to address exposures.

A long-term groundwater monitoring program for all on-site and off-site groundwater monitoring wells and the off-site potable well where levels previously exceeded the drinking water standard for fluoride will be established. Monitoring wells will be sampled semi-annually for fluoride, barium, cadmium, lead and PCBs.

Present Worth: *$324,000*
Capital Cost: *$0*
Annual Costs: *$21,000*

Exhibit C
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Lagoon Soil Alternatives			
LS-1: No Action	0	0	0
LS-2: Restoration to Pre-Disposal or Unrestricted Conditions	$7,730,000	0	$7,730,000
LS-3: Excavation (Top 6 to 8 feet), Disposal, Stabilization, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring	$3,384,000	$14,000	$3,606,000
LS-4: Excavation and Disposal (Top 4 to 6 feet), Ex-Situ Stabilization Unsaturated and Saturated Soils, Geomembrane/ Asphalt Cap, and Institutional Controls	$3,579,000	$14,000	$3,801,000
LS-5: Excavation and Disposal (Top 4 to 6 feet), In-Situ Solidification, Site Cover, Institutional Controls, and Long-Term Monitoring	$2,539,000	$14,000	$2,761,000
Surface Soil Alternatives			
SS-1: No Action	0	0	0
SS-2: Restoration to Pre-Disposal or Unrestricted Conditions	$7,252,000	0	$7,252,000
SS-3: Excavation, Ex-Situ Stabilization and On-Site Disposal	$1,206,000	0	$1,206,000
Sediment Alternatives			
SED-1: No Action	0	0	0
SED-2: Restoration to Pre-Disposal or Unrestricted Conditions	$3,751,000	0	$3,751,000
SED-3: Excavation/Dredging of Targeted Lead and PCB Impacted Sediment	$1,630,000	$5,000	$1,707,000
SED-4: Excavation/Removal of all Impacted Sediment and On-Site	$2,674,000	$5,000	$2,751,000

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Disposal			
SED-5: Excavation/Removal of Highest Lead and PCB Impacted Sediments	$ 1,176,000	$5,000	$1,253,000
Groundwater Alternatives			
GW-1: No Action	0	0	0
GW-2: Groundwater Control, Treatment and Long-Term Monitoring	$1,049,000	$257,000	$4,999,000
GW-3: Private Well Re-Sampling and Long-Term Monitoring	0	$21,000	$324,000
Proposed Remedy - Alternatives			
LS-5, SS-3, SED-3 and GW-3: Excavation and Solidification with Private Well Sampling and Long-Term Monitoring	$5,375,000	$40,000	$5,998,000

Exhibit D

SUMMARY OF THE SELECTED REMEDY

The Department has selected a combination of Alternatives LS-5 “Excavation and Disposal (Top 4 to 6 feet), In-Situ Solidification, Site Cover, Institutional Controls”, SS-3 “Excavation, Ex-Situ Stabilization and On-Site Disposal”, SED-3 “Excavation/Dredging of Targeted Lead and PCB Impacted Sediment”, and GW-3 “Private Well Re-Sampling and Long-Term Monitoring” as the remedy for this site. Alternatives LS-5, SS-3, SED-3 and GW-3 will achieve the remediation goals for the site by removing or solidifying contaminants of concern (COCs) in the on-site lagoon, removing surface soils on- and off-site exceeding commercial and residential SCOs, respectively, removing impacted sediments, and eliminating the source of fluoride concentrations in groundwater above the New York State Department of Health (NYSDOH) drinking water standard. IC/ECs will also be established to protect human health and the environment from remaining contamination. The elements of this remedy are described in Section 7. The selected remedy is depicted in Figure 2.

Basis for Selection

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

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

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

Alternatives LS-1, SS-1, SED-1 and GW-1 (No Action) do not provide any additional protection to public health and the environment and will not be evaluated further. Alternatives LS-2, SS-2, and SED-2 by removing all soil and sediments contaminated above the “unrestricted” soil cleanup objectives, meet the threshold criteria and provide the highest level of protection for human health and the environment. Alternatives LS-3, LS-4, LS-5, SS-3, SED-3, SED-4, and SED-5 also comply with this criterion but to a lesser degree or with lower certainty as some contamination will remain.

The selected remedy Alternative LS-5 will satisfy this criterion by removing and disposing off-site impacted lagoon soils to a depth of 4 to 6 feet and solidifying the remaining impacted lagoon soils. All soils that contain PCB concentrations above 50 parts per million (ppm) will be removed and disposed off-site. Alternative SS-3 will satisfy this criterion by removing on-and off-site impacted surface soil and sub-pavement soils and stabilizing this material for use as backfill in the lagoon. Removing surface soils will eliminate the potential for exposure to the public. Engineering (i.e., site cover) and institutional controls (i.e., environmental easement) will further limit exposure. By removing/solidifying these materials, the source of contamination to the groundwater will also be addressed.

Alternative GW-2 provides a high degree of protection for human health and the environment through groundwater treatment and long-term monitoring. Alternative GW-3 will provide a level of protection to public health and the environment through private well sampling and long-term monitoring.

Alternative SED-3 will satisfy this criterion by removing impacted sediment.

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

Lagoon soil alternative LS-2, surface soil alternative SS-2 and sediment alternative SED-2 comply with SCGs without the use of engineering and institutional controls.

Lagoon soil alternatives LS-4 and LS-5 and surface soil alternative SS-3 comply with SCGs. They address impacted lagoon soil, surface soil and sub-pavement soil and comply with the restricted use soil cleanup objectives at the surface through construction of a cover system. They also create the conditions necessary to restore groundwater quality to the extent practicable.

Sediment alternatives SED-3 and SED-4 and groundwater alternative GW-2 also comply with SCGs to the extent practicable. Lagoon soil alternative LS-3, sediment alternative SED-5 and groundwater alternative GW-3 comply with this criterion but to a lesser degree or lower certainty. Because lagoon soil alternatives LS-2, LS-3, LS-4, and LS-5, surface soil alternatives SS-2 and SS-3, sediment alternatives SED-2, SED-3, SED-4, and SED-5, and groundwater alternatives GW-2 and GW-3 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

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

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

Long-term effectiveness is best accomplished by those alternatives involving excavation of the contaminated soils/sediment. Lagoon soil alternatives LS-2, LS-4 and LS-5 provide the most long-term effectiveness by eliminating or minimizing long-term residual risks since the majority of impacted soils will be either permanently removed and transported off site for disposal or permanently stabilized/solidified and rendered immobile. The potential for direct contact will be decreased. Remaining impacts from alternatives LS-4 and LS-5 will be addressed by institutional controls. Alternative LS-3 provides a lesser degree of long-term effectiveness.

Surface soil alternative SS-2 provides a high degree of long-term effectiveness by the removal and off-site disposal of surface soil and sub-pavement soil with concentrations above unrestricted SCOs. Surface soil alternative SS-3 will also provide a high degree of long-term effectiveness by eliminating or minimizing long-term residual risks since all on-site soils and sub-pavement soils with concentrations above the commercial SCOs and all off-site surface soils with concentrations above the residential SCOs will be permanently removed and stabilized on-site, rendering these soils immobile. The stabilized soils will be used as backfill in the lagoon below the cover system and addressed by institutional controls.

Sediment alternatives SED-2, SED-3, SED-4 and SED-5 call for the removal of the majority of the impacted materials in the stream. Alternative SED-2 and SED-4 provide the most long-term effectiveness as they remove all sediments with cadmium and lead concentrations above the NYSDEC LEL and PCBs above 1 mg/kg from the stream. However, alternatives SED-2 and SED-4 have a significantly larger impact on the existing aquatic habitat

than either alternative SED-3 or SED-5. Alternative SED-5 has the lowest long-term effectiveness as it removes the least amount of the sediments with lead concentrations above the SEL.

Groundwater alternative GW-2 provides a high degree of long-term effectiveness by eliminating the continued off-site movement of groundwater with fluoride concentrations above the groundwater standards. Alternative GW-3 consists of private well sampling to re-evaluate the potential impact to off-site private well supplies and the site management plan (SMP) will include a provision for implementing actions recommended to address any exposures which may be identified. Long-term monitoring to evaluate groundwater quality is included in GW-2 and GW-3.

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

Alternatives which remove contaminated materials offer the highest degree of mobility, toxicity, and volume reduction. Alternatives LS-2, SS-2 and SED-2 reduce the on-site mobility and volume of contaminants by transferring all soil and sediments contaminated above the "unrestricted" soil cleanup objectives to an approved off-site location. However, depending on the disposal facility, the volume of the material will not be reduced. Alternative LS-3, which calls for the off-site treatment and disposal of the top six to eight feet of soils, and stabilization of soils at eight to fourteen feet depth, will effectively reduce the mobility of the contaminated material. Alternatives LS-4 and LS-5, which call for the complete removal of the upper four to six feet of soils, and stabilization of the remaining soils in the unsaturated zone and seven feet of soils in the saturated zone over 20% of the lagoon, effectively reduce the mobility of the contaminated material.

Alternatives SED-3, SED-4 and SED-5 reduce the mobility of contamination in the stream by removing contaminated sediments and placing them in the lagoon above the solidified lagoon material and beneath a cap. The total amount of sediments to be removed for alternatives SED-3, SED-4 and SED-5 is approximately 2,270 cubic yards, 4, 231 cubic yards, and 813 cubic yards, respectively. The toxicity and volume of sediment contaminants is not directly reduced by these alternatives via treatment or recycling. However, the toxicity of the sediment to aquatic life in the stream is reduced by the removal of the sediments from the stream.

Alternative GW-2, which involves groundwater control and treatment, will reduce the volume of fluoride leaving the site. Toxicity of the fluoride will not be affected. Alternative GW-3 will not reduce the toxicity, mobility or volume of contaminants but will include provisions in the SMP to address any impact from the site to private wells that may be identified.

Alternative SS-3, which calls for stabilization of on- and off-site surface and sub-pavement soils with concentrations above the commercial and residential SCGs and placement of these soils in the lagoon as backfill above the water table and below the site cap, will effectively reduce the mobility of contaminated surface soils.

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

Alternatives LS-2, LS-3, LS-4, LS-5, SS-2 and SS-3 all have short-term impacts which could easily be controlled. Alternatives LS-2 and SS-2 will have the most significant short-term impacts due to the intrusive activities involved with the excavation and handling of impacted soil. The time needed to achieve the remediation goals is the shortest for alternative LS-5 and longest for alternative LS-2.

Sediment alternatives SED-2, SED-3, SED-4 and SED-5 all have short-term impacts to wildlife receptors due to the disruption of the stream bed and short-term impacts to the surrounding area due to the excavation, handling, and transportation of sediments. Sediment alternative SED-5 will have the least impact to wildlife receptors compared to SED-3 and SED-4 due to the limited area of excavation. The disturbed area of the stream bank and adjacent area vegetation will be re-established. Maximizing habitat value and creating habitat are green remediation concepts encouraged by the Department's DER-31.

Groundwater alternatives GW-2 and GW-3 do not have any short-term impacts.

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

All alternatives, with the exception of alternatives LS-2, SS-2 and SED-2; Restoration to Unrestricted conditions, will require institutional controls. Institutional controls are easily implementable, but require coordination with C&D Technologies, Inc., the current property owner to file an environmental easement on the site.

Alternatives LS-5 and SS-3 are favorable in that they are readily implementable. Alternatives LS-2, LS-3 and LS-4 pose concerns with the implementation of the excavations. Special excavation procedures (sheet pile installation) will be required for excavating soil in the area of the lagoons to stabilize the adjacent building foundation and the excavation. There will also be greater truck staging and traffic.

Alternatives SED-3, SED-4 and SED-5 can be implemented using readily available materials, equipment and construction practices. The sediment removal will most likely be completed in stages due to the length of the excavation areas.

Alternative GW-3 utilizes common and readily available technology and services that are easily implemented. Alternative GW-2 requires the design of the ground water extraction system and implementability is dependent on sub-surface hydrogeology.

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

The costs of the alternatives vary significantly. The least expensive lagoon alternative is alternative LS-5 because it does not require a sheet piling system. With the large volume of soil to be handled and the extensive sheet piling system required, alternatives LS-2, LS-3 and LS-4 have the highest present worth of the alternatives. Alternative LS-2 will only marginally increase in protectiveness over alternative LS-5, but results in approximately $5 million more in cost.

Alternative SED-3 is considered more cost effective than alternative SED-4. Although alternative SED-5 has a lower present worth it removes very little material relative to alternatives SED-3 and SED-4.

Alternative GW-3 will only require low periodic groundwater monitoring costs and potential costs associated

with any actions recommended to address exposures. Alternative GW-2 is the most costly groundwater alternative, an additional $4.5 million more than Alternative GW-3.

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

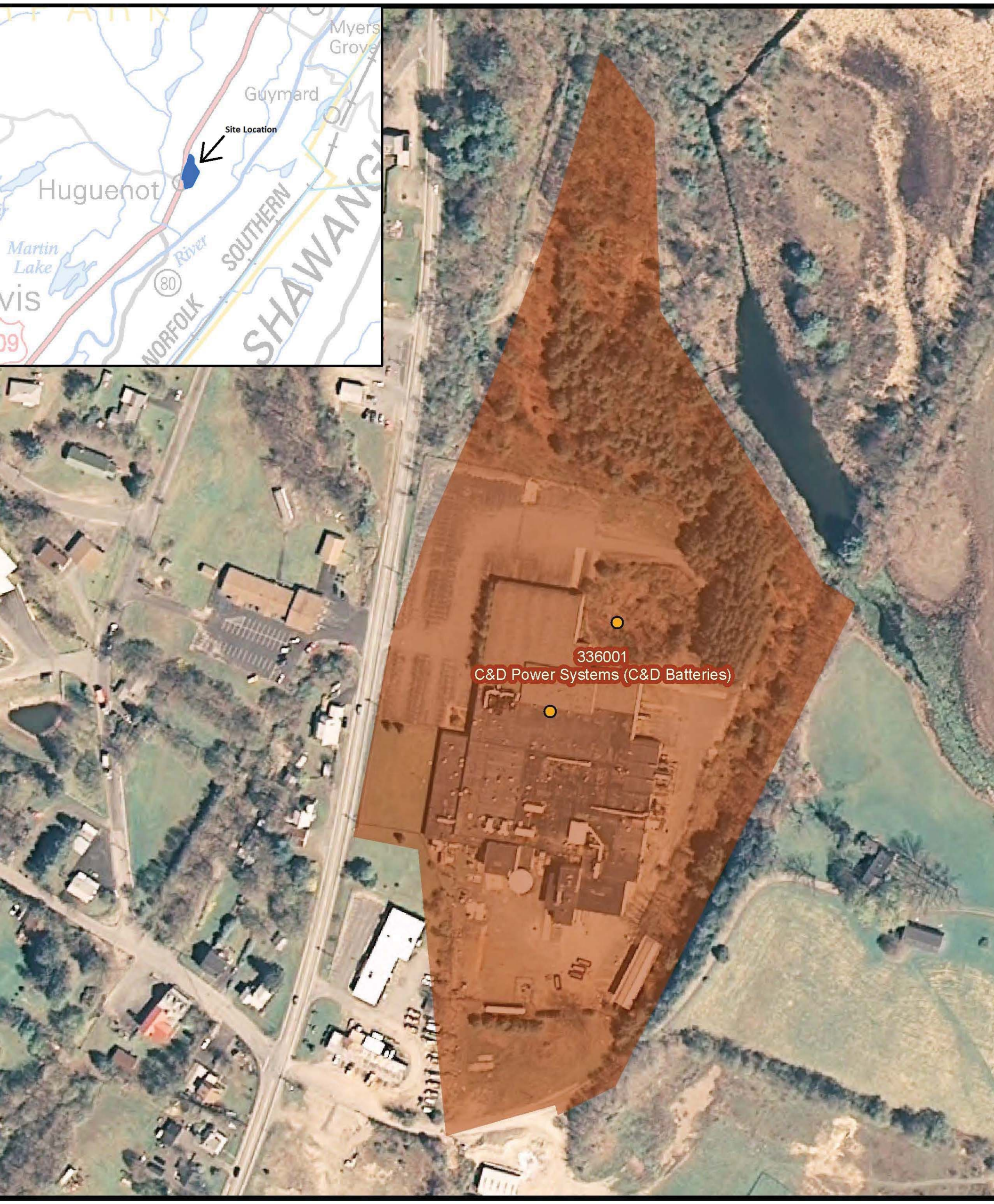
The anticipated future use of the site is commercial. Alternatives LS-3, LS-4, LS-5 and SS-3 will be less desirable because at least some contaminated soil remains on the property whereas alternatives LS-2 and SS-2 remove the contaminated soil permanently. However, the remaining contamination with alternatives LS-3, LS-4, LS-5 and SS-3 could be readily controlled with implementation of a site management plan. With alternatives LS-2 and SS-2 restrictions on the site use will not be necessary.

Sediment alternatives SED-2, SED-3, SED-4 and SED-5 achieve SCGs for protection of the environment and will be expected to meet residential SCOs.

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

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP were evaluated. A responsiveness summary was prepared that describes public comments received and the manner in which the Department addressed the concerns raised.

Alternatives LS-5, SS-3, SED-3 and GW-3 were selected because, as described above, they satisfy the threshold criteria and provide the best balance of the balancing criterion.



N

4080 160 240 320
Feet

Figure 1
Site Location
C&D Power Systems
Site #336001

FIGURE 2
C&D Power Systems Site (336001)
Proposed Remediation Areas
N
W
E
S
MW-12
MW-13
MW-6
MW-7
MW-14
MW-8
MW-9
MW-10
Site Boundary
MW-17
MW-17A
Legend
Long Term Ground Water Monitoring Locations
Lagoon Soil-3
Residential SCO Cleanup Area
Commercial SCO Cleanup Area
SED-1 Alternative
Lagoon Soil Alternative Soil- 3: Excavation with off-site disposal and on-site In-situ solidification/stabilization.
Sediment Alternative SED-1: Removal of all stream bed sediment between sediment sample locations SED-9 and SED-14 and placement in lagoon.
Surface Soil Alternative: Ex-situ stabilization and placement of the soils in the lagoon. On-site soils cleanup to commercial use soil cleanup objective. Off-site soils cleanup to residential use soil cleanup objective.
Ground Water Alternative GW-3 Long-Term Monitoring: Semi-annual collection of ground water samples from ten ground water monitoring wells and the Orange County rental property well.
100 50 0 100 Feet
Proposed Locations of Existing Monitoring Wells to be Included in Long-Term Monitoring Ground Water Monitoring Program Are Approximate

LEGEND

- = SEDIMENT SAMPLE SED 1 THRU SED 4
- = TEST PIT
- = MONITORING WELL
- = FIRE HYDRANT
- = FENCE POST
- = CHAIN LINK FENCE
- = 1ST FLOOR ELEVATION
- = EDGE OF PAVEMENT
- = TREE LINE
- = CONTOUR LINE
- = INDEX CONTOUR LINE
- = ELEVATION
- = SOIL SAMPLE

OU - 2 RI SAMPLING LOCATIONS

- NEW MONITORING WELL LOCATION
- SW-1 THROUGH SW-6
- SED-5 THROUGH SED-10
- SSCMP – SURFICIAL SOIL SAMPLE AT 12" CMP

NOTES:

Datum : Based on ground elevation of MW-1
Contour Interval = 1'

NA : Indicates Not Analyzed

All Results in ug / L

Values in Bold Exceed Ground water Standard.

July 31, 2001: Values in ( ) is field filtered or dissolved value.

July 31, 2001: Value / Value represents sample results from Water Sample obtained with bailer / Sample result from Micro-Purging procedure.

GROUNDWATER MONITORING WELL ID: MW-8

Compound	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	July 31, 2001	Aug. 27, 2003	March 31, 2005
Barium	26.7	NA	NA	21.6 (14.2)	15.2	12.56
Cadmium	NA	<5.0		<0.2 (<0.2)	<0.6	<0.3
Lead	17.5	NA		<2.8	<2.1	4.8
Lead (dissolved)	<3.0	NA		<2.8	NA	NA
Fluoride	**5,350**	NA		**6,300**	**6,560**	**5,320**
Fluoride (dissolved)	**5,120**	NA		NA	NA	NA
PCB s	NA	<1.0	<0.05	<0.065	<0.065	<0.065

GROUNDWATER MONITORING WELL ID: MW-7

Compound	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	July 31, 2001	Aug. 27, 2003	March 31, 2005
Barium	17.9	NA	NA	855 / 25.4	25.1	9.2
Cadmium	1.0 U	<5.0		**5.6** / 0.47	<0.6	0.67
Lead	15.4	NA		<2.8 / <2.8	<2.1	<2.9
Lead (dissolved)	<3.0	NA		NA	NA	NA
Fluoride	**10,900**	NA		**8,700 / 8,600**	**7,870**	**6,440**
Fluoride (dissolved)	**10,800**	NA		NA	NA	NA
PCB s	< 1.0	< 1.1	0.067	**0.31 / 0.14**	<0.065	<0.065

GROUNDWATER MONITORING WELL ID: MW-6

Compound (ug/L)	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	July 31, 2001	Aug 26, 2003	March 31, 2005
Barium	13.0	NA	NA	39.1 / 22.8	7.8	131
Cadmium	<1.0	<5.0		0.4 / <0.2	<0.6	0.35
Lead	**29.4**	NA		3 / < 2.8	< 2.1	6.8
Lead (dissolved)	<3.0	NA		NA	NA	NA
Fluoride	319	NA		1,100 / 580	140	**2,360**
Fluoride (dissolved)	264	NA		NA	NA	NA
PCB s	<1.0	<1.0	**0.24**	**0.23** / 0.051 J	<0.065	0.24

GROUNDWATER MONITORING WELL ID: MW-15

Compound	Aug. 27, 2003	March 30, 2005
Barium	80.6	132
Cadmium	<0.6	<0.3
Lead	<2.1	<2.9
Fluoride	120	<100
PCB s	0.078	<0.065

GROUNDWATER MONITORING WELL ID: MW-16

Compound	Aug. 27, 2003	March 30, 2005
Barium	16.1	42.7
Cadmium	<0.6	<0.3
Lead	<2.1	6.3
Fluoride	<100	<100
PCB s	0.035	<0.065

GROUNDWATER MONITORING WELL ID: MW-17A

Compound	Aug. 27, 2003	March 30, 2005
Barium	72.5	49
Cadmium	<0.6	<0.3
Lead	<2.1	<2.9
Fluoride	<100	<100
PCB s	0.032	<0.065

Compound	NYSDEC Ground water Standard (ug/L)
Barium	1,000
Cadmium	5
Lead	25
Fluoride	1,500
PCB s	0.09

GROUNDWATER MONITORING WELL ID: MW-13

Compound	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	July 31, 2001	Aug. 26, 2003	March 30, 2005
Barium	24.7	NA	NA	13.7	20.3	11.8
Cadmium	NA	<5.0		<0.2	<0.6	<0.3
Lead	5.2	NA		< 2.8	< 2.1	< 2.9
Lead (dissolved)	<2.0	NA		NA	NA	NA
Fluoride	642	NA		220	<100	<100
Fluoride (dissolved)	636	NA		NA	NA	NA
PCB s	NA	<1.4	<0.05	<0.065	<0.065	<0.065

GROUNDWATER MONITORING WELL ID: MW-12

Compound	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	July 31, 2001	Aug 26, 2003
Barium	56.8	NA	NA	9.5	16.4
Cadmium	NA	<5.0		<0.2	<0.6
Lead	17.7	NA		< 2.8	< 2.1
Lead (dissolved)	6.8	NA		NA	NA
Fluoride	521	NA		310	290
Fluoride (dissolved)	501	NA		NA	NA
PCB s	NA	<1.0	<0.05	0.041J	<0.065

GROUNDWATER MONITORING WELL ID: MW-12

Compound	April 1, 2005
Barium	17.7
Cadmium	<0.3
Lead	< 2.9
Lead (dissolved)	NA
Fluoride	170
Fluoride (dissolved)	NA
PCB s	<0.065

GROUNDWATER MONITORING WELL ID: MW-9

Compound	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	July 31, 2001	Aug. 27, 2003	March 31, 2005
Barium	28.5	NA	NA	34.1 (16.6)	18.7	18.5
Cadmium	NA	<5.0		<0.2 (<0.2)	<0.6	<0.3
Lead	20.5	NA		4.7	<2.1	<2.9
Lead (dissolved)	<3.0	NA		<2.8	NA	NA
Fluoride	**6,490**	NA		**6,200**	**6,520**	**5,180**
Fluoride (dissolved)	**6,390**	NA		NA	NA	NA
PCB s	NA	<1.0	<0.05	<0.065	<0.065	<0.065

GROUNDWATER MONITORING WELL ID: MW-10

Compound	Sept. 9,1999	Jan. 13, 2000	March 27, 2000	Aug. 27, 2003	March 31, 2005
Barium	124	NA	NA	48.5	28.2
Cadmium	NA	<5.0		<0.6	<0.3
Lead	13.1	NA		<2.1	<2.9
Lead (dissolved)	3.0 U	NA		NA	NA
Fluoride	**3,340**	NA		**5,530**	**6,160**
Fluoride (dissolved)	**3,320**	NA		NA	NA
PCB s	NA	1.0	<0.05	<0.065	<0.065

GROUNDWATER MONITORING WELL ID: MW-17

Compound	Aug. 27, 2003	March 30, 2005
Barium	21.8	110
Cadmium	<0.6	<0.3
Lead	<2.1	<2.9
Fluoride	**1,800**	**2,120**
PCB s	0.063	<0.065

GROUNDWATER MONITORING WELL ID: MW-14

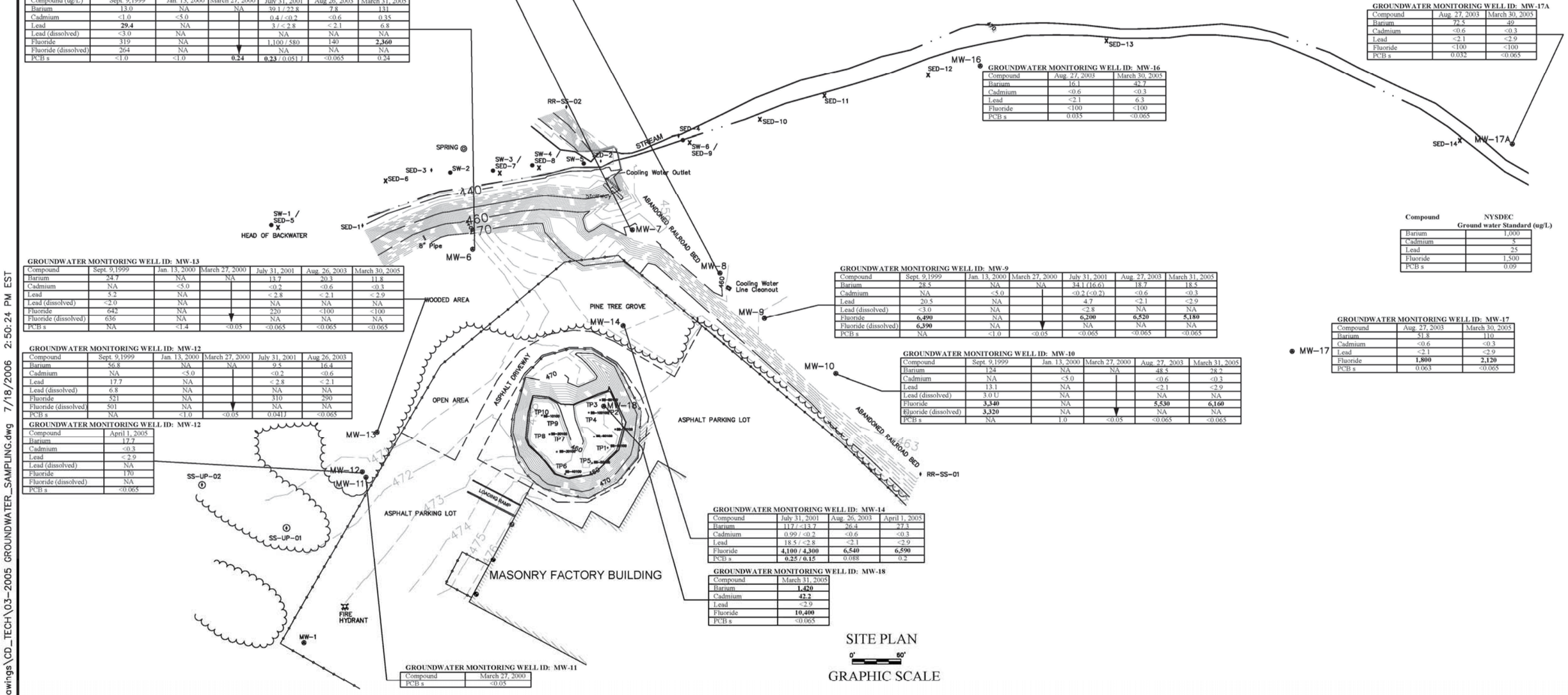
Compound	July 31, 2001	Aug. 26, 2003	April 1, 2005
Barium	117 / <13.7	26.4	27.3
Cadmium	0.99 / <0.2	<0.6	<0.3
Lead	18.5 / <2.8	<2.1	<2.9
Fluoride	**4,100 / 4,300**	**6,540**	**6,590**
PCB s	**0.25 / 0.15**	0.088	0.2

GROUNDWATER MONITORING WELL ID: MW-18

Compound	March 31, 2005
Barium	**1,420**
Cadmium	**42.2**
Lead	<2.9
Fluoride	**10,400**
PCB s	<0.065

GROUNDWATER MONITORING WELL ID: MW-11

Compound	March 27, 2000
PCB s	<0.05



DATE: 07-18-06
DRAWN BY: KJ
SCALE: AS SHOWN
REVIEWED BY: EF

DELAWARE ENGINEERING, P.C.
ALBANY:
28 Madison Avenue Extension - Albany, NY 12203
Phone: (518) 452-1290 - Fax: (518) 452-1335
CHICOPEE:

REVISIONS

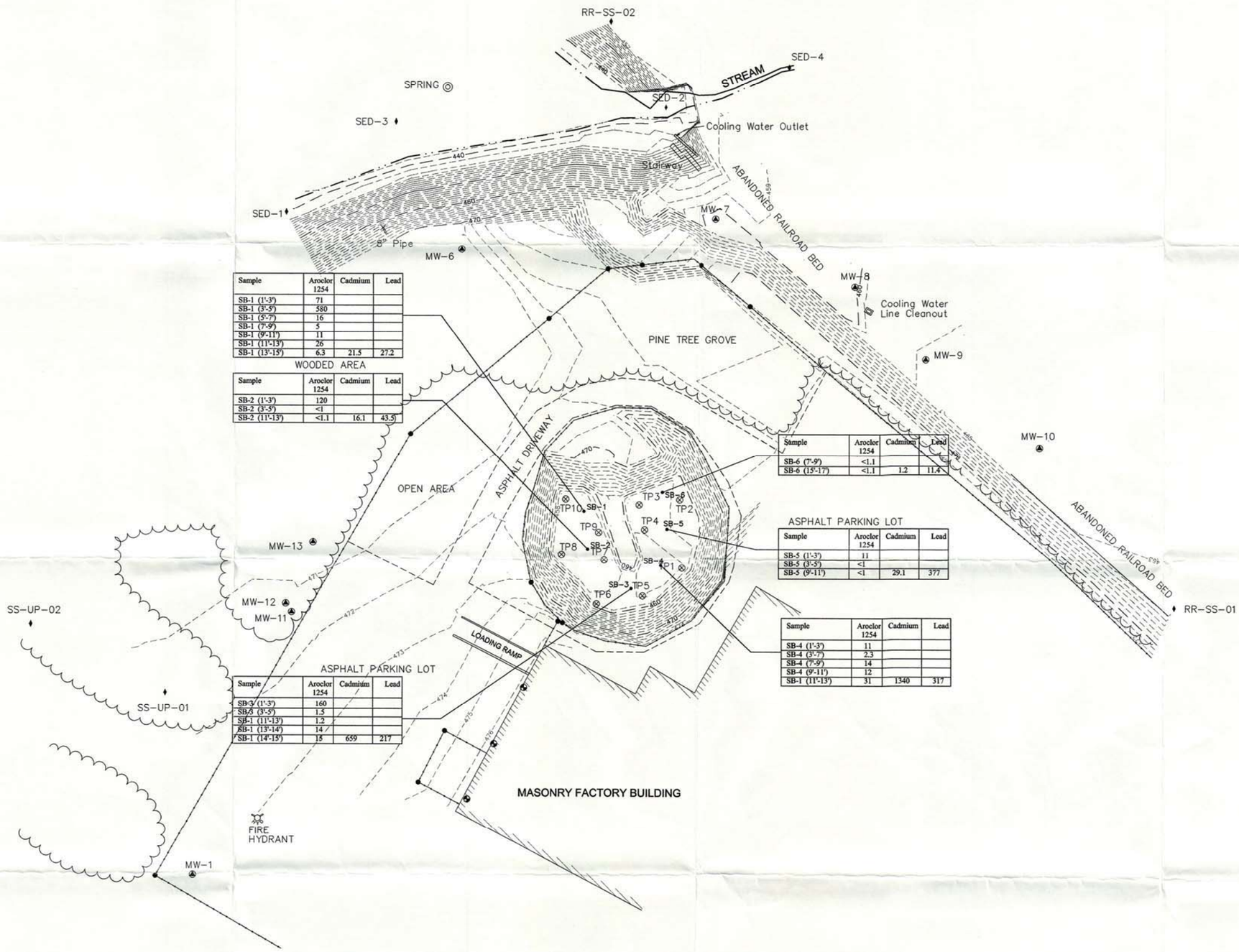
NO.	DATE	DESCRIPTION

OU - 2 RI
C & D TECHNOLOGIES
NYS ROUTE 209
HUGUENOT, NEW YORK

Figure 3
GROUNDWATER SAMPLING DATA

SHEET:

H:\Drawings\CD_TECH\03-2005 GROUNDWATER_SAMPLING.dwg 7/18/2006 2:50:24 PM EST



Sample	Aroclor 1254	Cadmium	Lead
SB-1 (1'-3')	71		
SB-1 (3'-5')	580		
SB-1 (5'-7')	16		
SB-1 (7'-9')	5		
SB-1 (9'-11')	11		
SB-1 (11'-13')	26		
SB-1 (13'-15')	6.3	21.5	27.2

WOODED AREA

Sample	Aroclor 1254	Cadmium	Lead
SB-2 (1'-3')	120		
SB-2 (3'-5')	<1		
SB-2 (11'-13')	<1.1	16.1	43.5

Sample	Aroclor 1254	Cadmium	Lead
SB-6 (7'-9')	<1.1		
SB-6 (15'-17')	<1.1	1.2	11.4

ASPHALT PARKING LOT

Sample	Aroclor 1254	Cadmium	Lead
SB-5 (1'-3')	11		
SB-5 (3'-5')	<1		
SB-5 (9'-11')	<1	29.1	377

Sample	Aroclor 1254	Cadmium	Lead
SB-4 (1'-3')	11		
SB-4 (3'-7')	2.3		
SB-4 (7'-9')	14		
SB-4 (9'-11')	12		
SB-1 (11'-13')	31	1340	317

ASPHALT PARKING LOT

Sample	Aroclor 1254	Cadmium	Lead
SB-3 (1'-3')	160		
SB-3 (3'-5')	1.5		
SB-1 (11'-13')	1.2		
SB-1 (13'-14')	14		
SB-1 (14'-15')	15	659	217

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND

- ♦ = SOIL SAMPLE
- ⊗ = TEST PIT
- ♣ = MONITORING WELL
- = FIRE HYDRANT
- ● = FENCE POST
- = CHAIN LINK FENCE
- = 1ST FLOOR ELEVATION
- — = EDGE OF PAVEMENT
- = TREE LINE
- = CONTOUR LINE
- = INDEX CONTOUR LINE
- 465 = ELEVATION

NOTES:

Datum : Based on ground elevation of MW-1
Contour Interval = 1'

All values in mg / kg.

Figure 4

SUMMARY SOIL BORING DATA

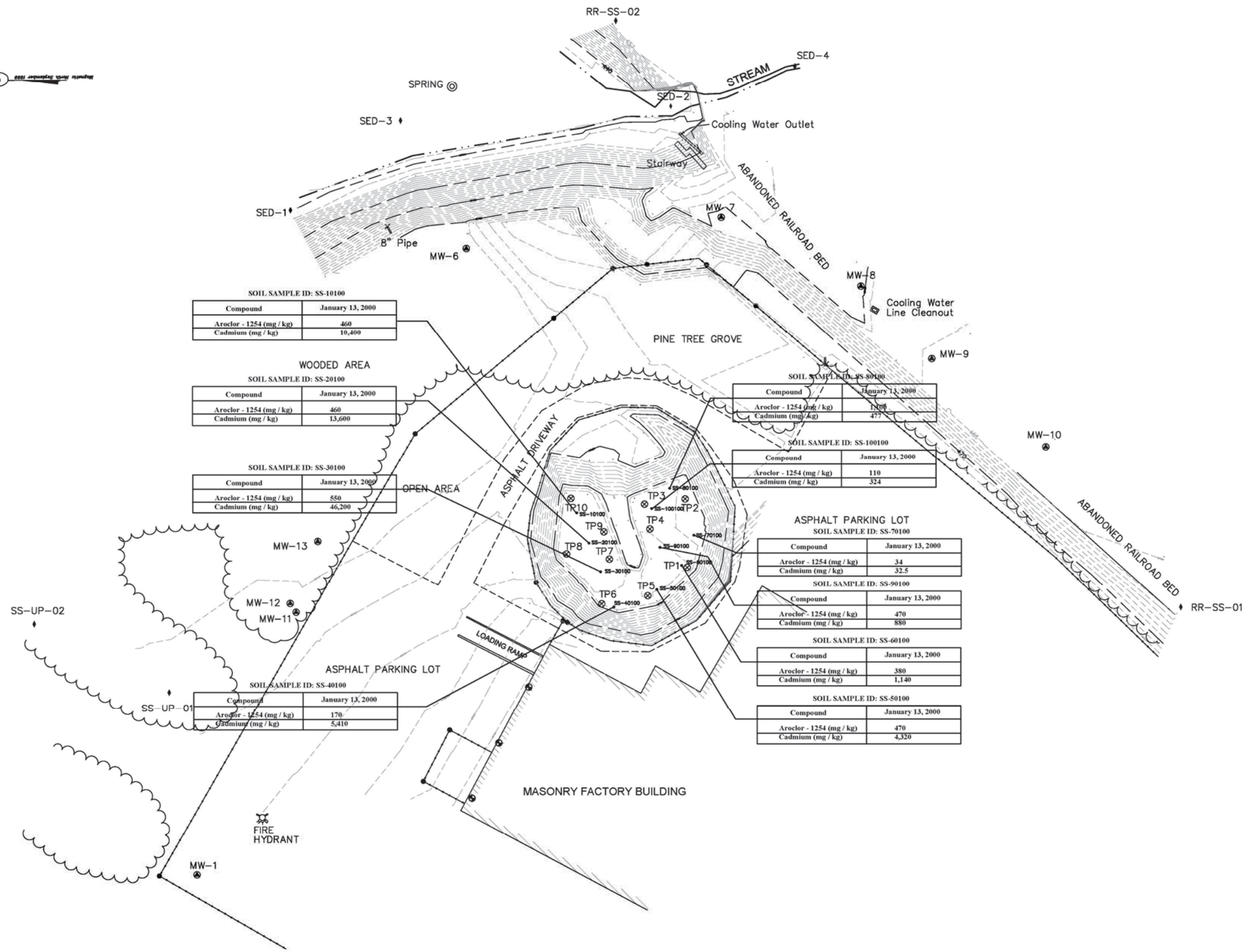
SITE AT
C & D TECHNOLOGIES
NYS ROUTE 209
HUGUENOT, NEW YORK

DELAWARE ENGINEERING, P.C.
28 Madison Avenue Extension
Albany, New York 12203
Phone 518-452-1290
FAX 518-452-1335

SCALE	AS SHOWN
DATE	MAY 22, 2000
DRAWN BY	KJ
CHECKED BY	
APPROVED BY	E.F.
FILENAME	Soil Boring Data
PROJECT NO.	
REVISED	

DRAWING NUMBER No. 4 SHEET NUMBER 1 OF 1

FILENAME: SOIL_BORING_DATA.DWG



SOIL SAMPLE ID: SS-10100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	460
Cadmium (mg / kg)	10,400

SOIL SAMPLE ID: SS-20100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	460
Cadmium (mg / kg)	13,600

SOIL SAMPLE ID: SS-30100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	550
Cadmium (mg / kg)	46,200

SOIL SAMPLE ID: SS-40100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	170
Cadmium (mg / kg)	5,410

SOIL SAMPLE ID: SS-80100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	1,100
Cadmium (mg / kg)	477

SOIL SAMPLE ID: SS-100100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	110
Cadmium (mg / kg)	324

SOIL SAMPLE ID: SS-70100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	34
Cadmium (mg / kg)	32.5

SOIL SAMPLE ID: SS-90100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	470
Cadmium (mg / kg)	880

SOIL SAMPLE ID: SS-60100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	380
Cadmium (mg / kg)	1,140

SOIL SAMPLE ID: SS-50100

Compound	January 13, 2000
Aroclor - 1254 (mg / kg)	470
Cadmium (mg / kg)	4,320

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND

- = SOIL SAMPLE
- = TEST PIT
- = MONITORING WELL
- = FIRE HYDRANT
- = FENCE POST
- = CHAIN LINK FENCE
- = 1ST FLOOR ELEVATION
- = EDGE OF PAVEMENT
- = TREE LINE
- = CONTOUR LINE
- = INDEX CONTOUR LINE
- 465 = ELEVATION

NOTES:

Datum : Based on ground elevation of MW-1
Contour Interval = 1'

Compound	Commercial Use SCO
PCB	1.0 mg / kg
Cadmium	9.3 mg / kg

Figure 5

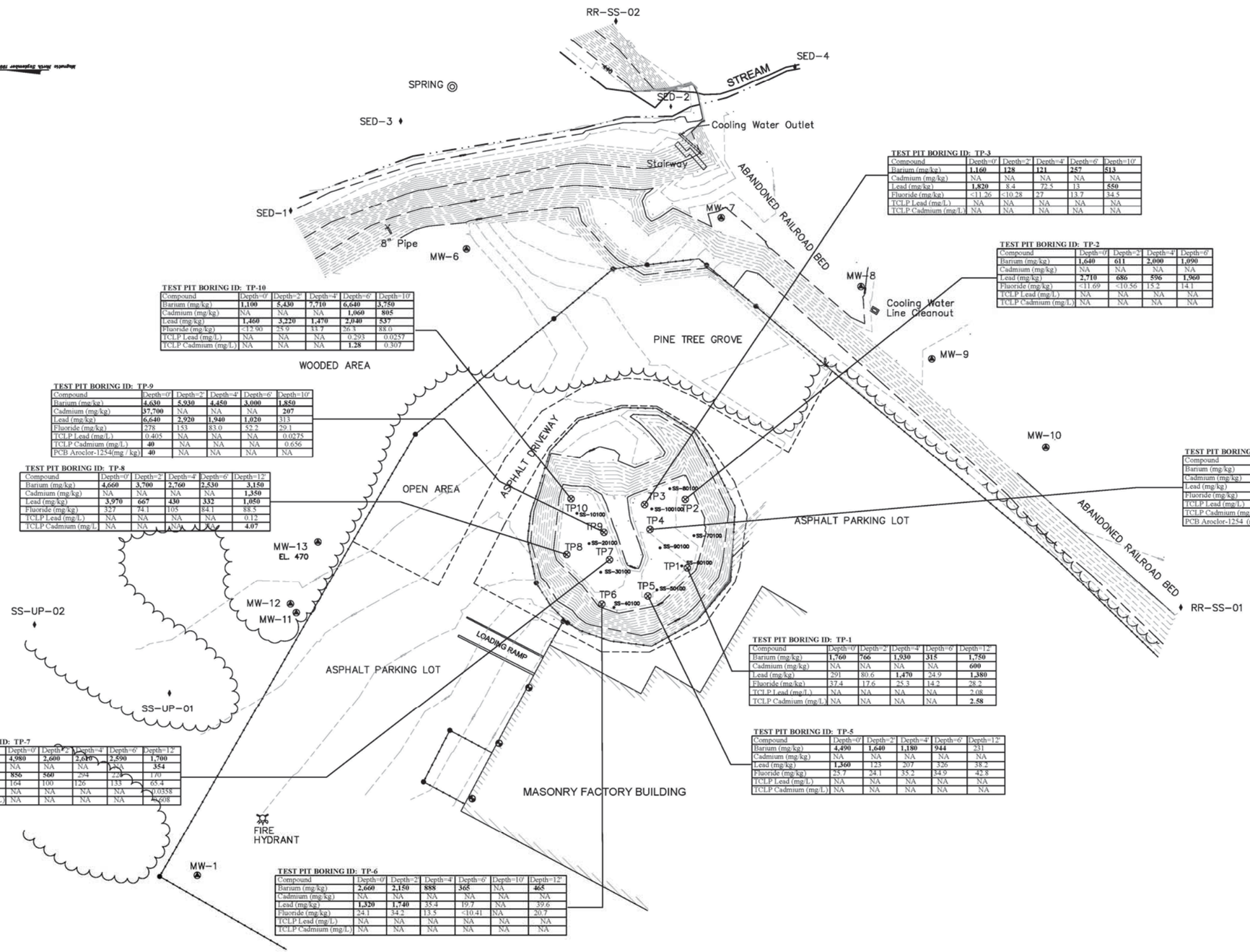
PCB & CADMIUM SURFACE SOIL SAMPLING DATA SUMMARY

SITE AT
C & D TECHNOLOGIES
NYS ROUTE 209
HUGUENOT, NEW YORK

DELAWARE ENGINEERING, P.C.
28 Madison Avenue Extension
Albany, New York 12203
Phone 518-452-1290
FAX 518-452-1335

SCALE	AS SHOWN
DATE	MAY 22, 2000
DRAWN BY	KJ
CHECKED BY	
APPROVED BY	EF
FILENAME	PCB 1.DWG
PROJECT NO.	
REVISED	

DRAWING NUMBER No. 3 SHEET NUMBER 1 OF 1



TEST PIT BORING ID: TP-3

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=10'
Barium (mg/kg)	**1,160**	**128**	**121**	**257**	**513**
Cadmium (mg/kg)	NA	NA	NA	NA	NA
Lead (mg/kg)	**1,820**	8.4	72.5	13	**550**
Fluoride (mg/kg)	<11.26	<10.28	27	13.7	34.5
TCLP Lead (mg/L)	NA	NA	NA	NA	NA
TCLP Cadmium (mg/L)	NA	NA	NA	NA	NA

TEST PIT BORING ID: TP-2

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'
Barium (mg/kg)	**1,640**	**611**	**2,000**	**1,090**
Cadmium (mg/kg)	NA	NA	NA	NA
Lead (mg/kg)	**2,710**	**686**	**596**	**1,960**
Fluoride (mg/kg)	<11.69	<10.56	15.2	14.1
TCLP Lead (mg/L)	NA	NA	NA	NA
TCLP Cadmium (mg/L)	NA	NA	NA	NA

TEST PIT BORING ID: TP-10

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=10'
Barium (mg/kg)	**1,100**	**5,430**	**7,710**	**6,640**	**3,750**
Cadmium (mg/kg)	NA	NA	NA	**1,060**	**805**
Lead (mg/kg)	**1,460**	**3,220**	**1,470**	**2,040**	**537**
Fluoride (mg/kg)	<12.90	25.9	33.7	26.3	88.0
TCLP Lead (mg/L)	NA	NA	NA	0.293	0.0257
TCLP Cadmium (mg/L)	NA	NA	NA	**1.28**	0.307

TEST PIT BORING ID: TP-9

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=10'
Barium (mg/kg)	**4,630**	**5,930**	**4,450**	**3,000**	**1,850**
Cadmium (mg/kg)	**37,700**	NA	NA	NA	**207**
Lead (mg/kg)	**6,640**	**2,920**	**1,940**	**1,020**	313
Fluoride (mg/kg)	278	153	83.0	52.2	29.1
TCLP Lead (mg/L)	0.405	NA	NA	NA	0.0275
TCLP Cadmium (mg/L)	**40**	NA	NA	NA	0.656
PCB Aroclor-1254(mg / kg)	**40**	NA	NA	NA	NA

TEST PIT BORING ID: TP-8

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=12'
Barium (mg/kg)	**4,660**	**3,700**	**2,760**	**2,530**	**3,150**
Cadmium (mg/kg)	NA	NA	NA	NA	**1,350**
Lead (mg/kg)	**3,970**	**667**	**430**	**332**	**1,050**
Fluoride (mg/kg)	327	74.1	105	84.1	88.5
TCLP Lead (mg/L)	NA	NA	NA	NA	0.12
TCLP Cadmium (mg/L)	NA	NA	NA	NA	**4.07**

TEST PIT BORING ID: TP-4

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=10'
Barium (mg/kg)	**4,670**	**1,060**	**1,100**	**701**	**2,280**
Cadmium (mg/kg)	NA	NA	NA	NA	**1,260**
Lead (mg/kg)	**1,950**	**9,350**	**7,190**	**13,000**	**6,830**
Fluoride (mg/kg)	<15.45	<11.98	22.1	24.2	31.5
TCLP Lead (mg/L)	NA	NA	NA	NA	**5.46**
TCLP Cadmium (mg/L)	NA	NA	NA	NA	**3.76**
PCB Aroclor-1254 (mg/kg)	NA	NA	NA	NA	6.5

TEST PIT BORING ID: TP-1

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=12'
Barium (mg/kg)	**1,760**	**766**	**1,930**	**315**	**1,750**
Cadmium (mg/kg)	NA	NA	NA	NA	**600**
Lead (mg/kg)	291	80.6	**1,470**	24.9	**1,380**
Fluoride (mg/kg)	37.4	17.6	25.3	14.2	28.2
TCLP Lead (mg/L)	NA	NA	NA	NA	2.08
TCLP Cadmium (mg/L)	NA	NA	NA	NA	**2.58**

TEST PIT BORING ID: TP-5

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=12'
Barium (mg/kg)	**4,490**	**1,640**	**1,180**	**944**	231
Cadmium (mg/kg)	NA	NA	NA	NA	NA
Lead (mg/kg)	**1,360**	123	207	326	38.2
Fluoride (mg/kg)	25.7	24.1	35.2	34.9	42.8
TCLP Lead (mg/L)	NA	NA	NA	NA	NA
TCLP Cadmium (mg/L)	NA	NA	NA	NA	NA

TEST PIT BORING ID: TP-7

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=12'
Barium (mg/kg)	**4,980**	**2,600**	**2,610**	**2,590**	**1,700**
Cadmium (mg/kg)	NA	NA	NA	NA	**354**
Lead (mg/kg)	**856**	**560**	294	228	170
Fluoride (mg/kg)	164	100	126	133	65.4
TCLP Lead (mg/L)	NA	NA	NA	NA	0.0358
TCLP Cadmium (mg/L)	NA	NA	NA	NA	0.608

TEST PIT BORING ID: TP-6

Compound	Depth=0'	Depth=2'	Depth=4'	Depth=6'	Depth=10'	Depth=12'
Barium (mg/kg)	**2,660**	**2,150**	**888**	**365**	NA	**465**
Cadmium (mg/kg)	NA	NA	NA	NA	NA	NA
Lead (mg/kg)	**1,320**	**1,740**	35.4	19.7	NA	39.6
Fluoride (mg/kg)	24.1	34.2	13.5	<10.41	NA	20.7
TCLP Lead (mg/L)	NA	NA	NA	NA	NA	NA
TCLP Cadmium (mg/L)	NA	NA	NA	NA	NA	NA

LEGEND

- = SOIL SAMPLE
- = TEST PIT
- = MONITORING WELL
- = FIRE HYDRANT
- = FENCE POST
- = CHAIN LINK FENCE
- = 1ST FLOOR ELEVATION
- = EDGE OF PAVEMENT
- = TREE LINE
- = CONTOUR LINE
- = INDEX CONTOUR LINE
- 465 = ELEVATION

NOTES:

Datum : Based on ground elevation of MW-1
Contour Interval = 1'

NA : Indicates Not Analyzed

Values in Bold Exceed R.S.C.O.

Lead Values in Bold Exceed both Site Background and Typical Metropolitan and Suburban Concentrations.

Compound	PART 375 Commercial Use SCO
Barium (mg/kg)	400
Cadmium (mg/kg)	9.3
Lead (mg/kg)	1,000
Fluoride (mg/kg)	NA
TCLP Lead (mg/L)	5
TCLP Cadmium (mg/L)	1
PCB (mg / kg)	1

Figure 6

TEST PIT SAMPLING DATA SUMMARY

SITE AT
C & D TECHNOLOGIES
NYS ROUTE 209
HUGUENOT, NEW YORK

DELAWARE ENGINEERING, P.C.
28 Madison Avenue Extension
Albany, New York 12203
Phone 518-452-1290
FAX 518-452-1335

SCALE	AS SHOWN
DATE	MAY 22, 2000
DRAWN BY	KJ
CHECKED BY	
APPROVED BY	EF
FILENAME	PCB 1.DWG
PROJECT NO.	
REVISED	

DRAWING NUMBER No. 2 SHEET NUMBER 1 OF 1

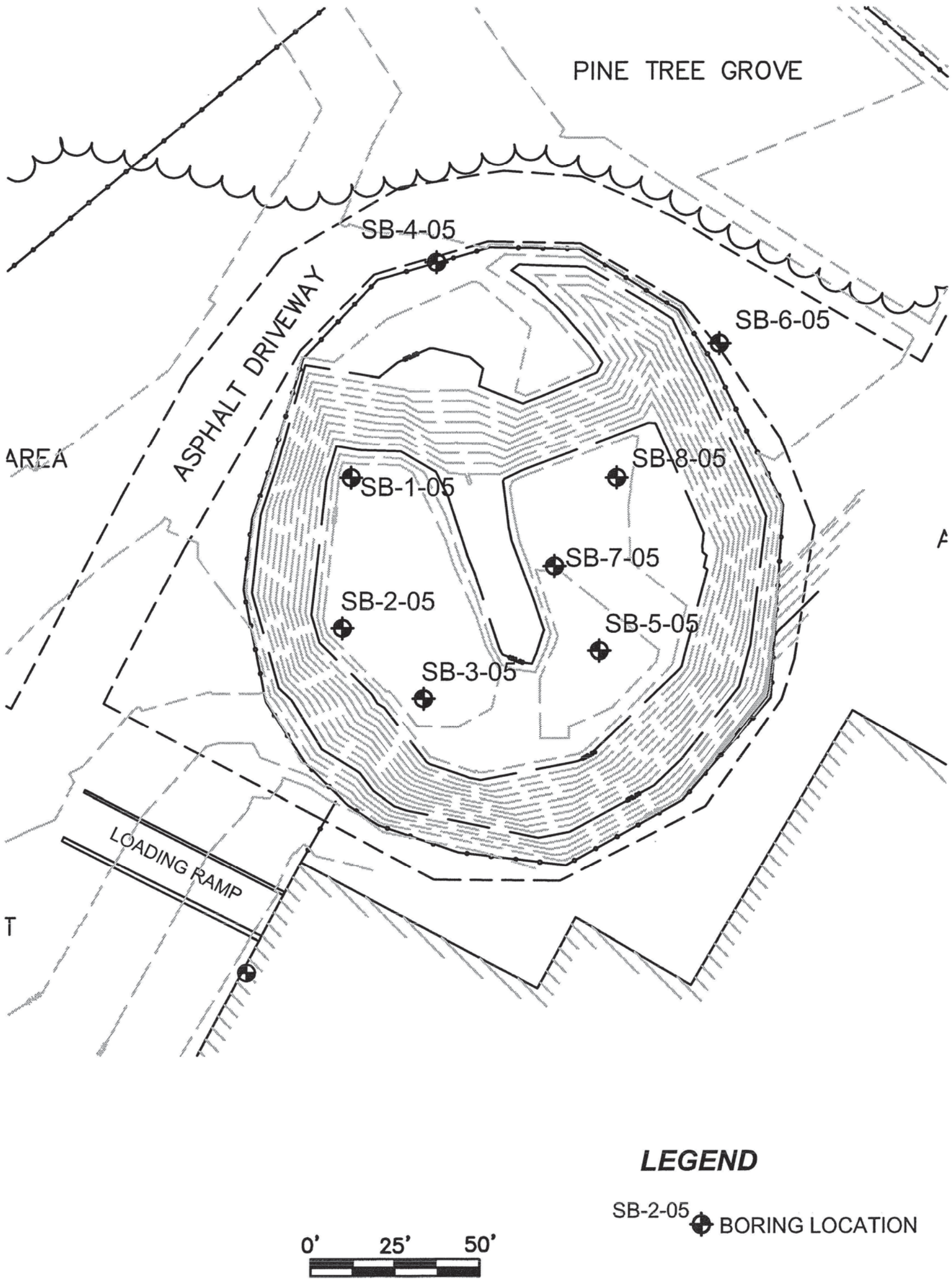


Figure 7

LAGOON SATURATED ZONE BORING LOCATIONS

C & D TECHNOLOGIES, INC.
HUGUENOT, NEW YORK

DATE: 11/11/04
DRAWN BY: KJ
SCALE: AS SHOWN
REVIEWED BY: EF
DATE REVISED: 01/05/05

DELAWARE ENGINEERING,
CIVIL AND ENVIRONMENTAL ENGINEERING
ALBANY:
28 Madison Avenue Extension - Albany
Phone: (518) 452-1290 - Fax: (518) 452
ONEONTA:
8-12 Dietz Street, Suite 303 - Oneonta,
Phone: (607) 432-8073 - Fax: (607) 43

Drawings Archive\CD_TECH\FIG_8_LAGOONSATUR_ZONE

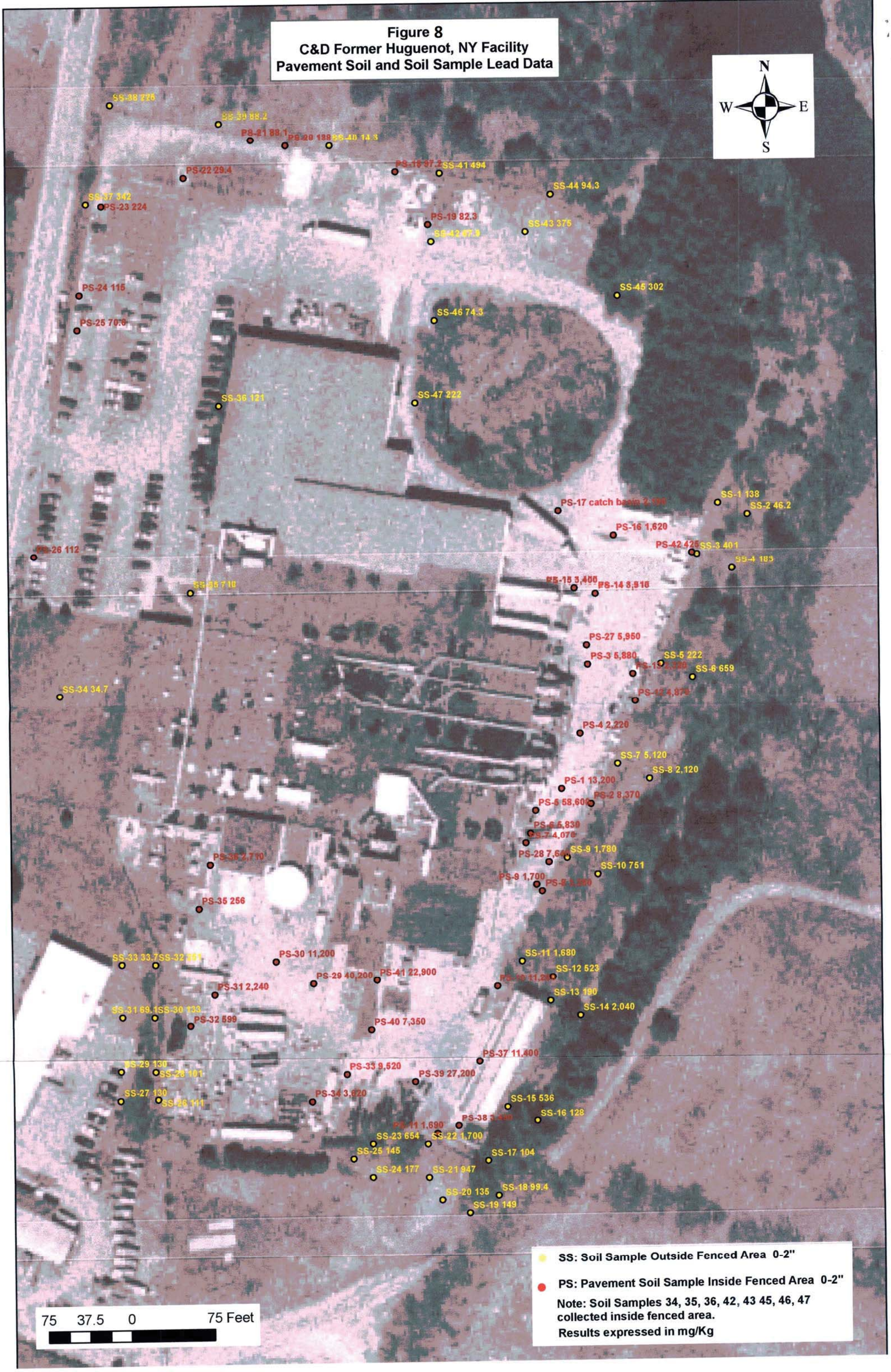


Figure 8
C&D Former Huguenot, NY Facility
Pavement Soil and Soil Sample Lead Data
N
W
E
S
SS-38 225
SS-39 88.2
PS-21 88.1
PS-20 139
SS-40 14.3
PS-22 29.4
PS-18 97.2
SS-41 494
SS-44 94.3
SS-37 342
PS-23 224
PS-19 82.3
SS-43 375
SS-42 67.9
PS-24 115
SS-45 302
SS-46 74.3
PS-25 70.6
SS-36 121
SS-47 222
SS-1 138
SS-2 46.2
PS-17 catch basin 2,190
PS-16 1,620
PS-42 425
SS-3 401
SS-4 183
PS-26 112
SS-35 7.10
PS-15 3,400
PS-14 8,910
PS-27 5,950
PS-3 5,880
SS-5 222
PS-13 2,720
SS-6 659
SS-34 34.7
PS-12 4,870
PS-4 2,220
SS-7 5,120
SS-8 2,120
PS-1 13,200
PS-2 8,370
PS-5 58,600
PS-6 5,830
PS-7 4,070
SS-9 1,780
PS-28 7,640
PS-36 2,710
SS-10 751
PS-9 1,700
PS-8 1,200
PS-35 256
SS-33 33.7
SS-32 261
PS-30 11,200
SS-11 1,680
SS-12 523
PS-29 40,200
PS-41 22,900
PS-10 11,200
PS-31 2,240
SS-13 190
SS-14 2,040
SS-31 69.1
SS-30 133
PS-32 599
PS-40 7,350
PS-37 11,400
SS-29 130
SS-28 101
PS-33 9,520
PS-39 27,200
SS-27 130
SS-26 111
PS-34 3,820
SS-15 536
SS-16 128
PS-38 3,440
PS-11 1,690
SS-23 654
SS-22 1,700
SS-25 145
SS-17 104
SS-24 177
SS-21 947
SS-20 135
SS-18 99.4
SS-19 149
SS: Soil Sample Outside Fenced Area 0-2"
PS: Pavement Soil Sample Inside Fenced Area 0-2"
Note: Soil Samples 34, 35, 36, 42, 43 45, 46, 47 collected inside fenced area.
Results expressed in mg/Kg
75 37.5 0 75 Feet

C&D Power Systems Site
Site No. 336001
Tributary D-1-7 Sedmiment Data
N
Figure 9
Legend
Sediment Sample Locations
Lead > Lowest Effect Level
Cadmium and Lead > Lowest Effect Level
Values in red exceed the Metals Severe Effect Level Criteria
or the PCB aquatic life chronic toxicity criteria
Prepared by Delaware Engineering, P.C. April 2007
Sources NYS Digital Ortho Imagery 2004
100 50 0 100 Feet

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

C&D Power Systems (C&D Batteries)
State Superfund Project/RCRA Project
Deerpark, Orange County, New York
Site No. 336001
EPA ID #NYD064337298

The Proposed Remedial Action Plan (PRAP) for the C&D Power Systems (C&D Batteries) site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 11, 2015. The PRAP outlined the remedial measure proposed for the contaminated soil, sediment, and groundwater at the C&D Batteries site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on February 26, 2015, which included a presentation of the remedial investigation, feasibility study (RI/FS) for the C&D Batteries site as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 18, 2015.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

COMMENT 1: Will children be able to play on the site once remediation is complete?

RESPONSE 1: Part of the remedy is to construct a site cover to allow for commercial use of the property. The site cover will consist of either structures such as buildings, pavement, sidewalks comprising any site development or a minimum of one foot of soil meeting the soil cleanup objectives (SCOs) for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. Commercial use allows for passive recreational uses such as walking, cycling, golf and green park space, which would be acceptable at the site following the construction of the site cover.

COMMENT 2: Are sediments going into the lagoon untreated?

RESPONSE 2: Although tributary D-1-7 sediment exceeds the Department sediment quality criteria, the concentrations are below the commercial use and protection of groundwater soil cleanup objectives (SCOs). Therefore, the sediment can be used as backfill in the lagoon. The sediment will be placed above the stabilized soils and below the cover system. Some treatment to change the physical properties of the sediment may be necessary for transport and stability prior to placement in the lagoon.

COMMENT 3: What is the allowable end use?

RESPONSE 3: The cleanup at the property allows for commercial or industrial use. However, actual use is subject to local zoning.

COMMENT 4: How long will monitoring be performed on the site?

RESPONSE 4: Monitoring will continue on the site until the Department and NYSDOH have determined that the remedy has achieved the remedial action objectives for the site, in this case groundwater standards. For the purpose of cost estimation, it is assumed that monitoring will continue for 30 years.

COMMENT 5: Is there money available to perform the remedial work?

RESPONSE 5: The remedial program is currently being conducted by the Potentially Responsible Party (PRP) under an Order on Consent. After the Record of Decision (ROD) is issued, the PRP will be given an opportunity to enter into an Order on Consent for implementation of the design, construction and long-term management of the remedy. If the PRP does not enter into an Order on Consent with the Department, then the Department will implement the remedy under the State Superfund. The Department would then refer the site to the New York State Attorney General to recover the costs expended for the remedy from the PRP.

COMMENT 6: Can water be used on the site?

RESPONSE 6: Groundwater cannot be used on the site as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH.

COMMENT 7: Are you just adding cement to the lagoon soil? How does this work?

RESPONSE 7: The contaminated lagoon soil will be mixed in place with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to encapsulate and chemically bind the contaminated soil in a low permeability matrix. The resulting solid matrix reduces or eliminates the mobility of the contaminants and reduces or eliminates the matrix as a source of groundwater contamination.

COMMENT 8: What is the timeline for the work to be performed?

RESPONSE 8: Once the ROD is issued, the Department will approach the PRP for this site, to enter into an Order on Consent for implementation of the design and construction of the remedy. Once the Order is signed, the design phase will begin, which is estimated to take between 6 months to a year. The construction following the design of the remedy is expected to take 6 months.

COMMENT 9: A representative from C&D Technologies, Inc. stated that Avnet, Inc. is responsible for 87% of the costs for the site based on an agreement between C&D Technologies, Inc. and Avnet, Inc.

RESPONSE 9: The comment is noted.

Mr. Alfred Fusco submitted a letter dated March 2, 2015, which included the following comments:

COMMENT 10: As discussed at the public meeting, the town of Deerpark has a contaminated well only a few feet from the property which rendered the Town Hall water unpotable. Funding was requested to cap this well and either drill another well or run water from the Senior Center well and install iron removal equipment and a disinfection system. Test results will be forwarded to the Department when available.

RESPONSE 10: The Department was unaware of the contaminated Town Hall potable well until recently, first being informed of the issue when speaking with the Town of Deerpark supervisor at the public meeting. If it is determined, based on review of analytical data, that the contamination is related to the C&D Batteries site, then the treatment required for the Town Hall potable well will be included as a component of the site remedy. As part of the selected remedy, wells in the area will be re-evaluated and any site-related contamination that is identified will be addressed.

Mr. Frank Demuth submitted an email (dated March 12, 2015) which included the following comments:

COMMENT 11: A request was made for the proposals for remediation at the site and for any information and results regarding recent groundwater testing.

RESPONSE 11: A copy of the proposed remedial action plan (PRAP) was sent to Mr. Demuth. Previous groundwater sampling indicated fluoride was the only contaminant of concern detected in groundwater. The town hall and the Swartout residence groundwater supplies were sampled and found not to be contaminated. As part of the selected remedy, wells in the area will be re-evaluated and any site-related contamination that is identified will be addressed.

APPENDIX B

Administrative Record

Administrative Record

C&D Power Systems (C&D Batteries) Site
State Superfund Project/RCRA Project
Deerpark, Orange County, New York
Site No. 336001
EPA ID #NYD064337298

1. Proposed Remedial Action Plan for the C&D Power Systems (C&D Batteries) site, dated February 2015, prepared by the Department.

2. Order on Consent, Index No. W3-0726-97-11, between the Department and C&D Technologies, Inc., executed on July 19, 1999.

3. "Remedial Investigation/Feasibility Study Work Plan", April 1999, prepared by Earth Tech.

4. "Remedial Investigation Report", March 2001, prepared by Delaware Engineering.

5. "Feasibility Study Report", March 2001, prepared by Delaware Engineering.

6. Proposed Remedial Action Plan for the C&D Power Systems (C&D Batteries) Operable Unit No. 1, dated February 2002, prepared by the Department.

7. Record of Decision, C&D Power Systems (C&D Batteries) Operable Unit No. 1, dated March 2002, prepared by the Department.

8. "Operable Unit 2 Remedial Investigation Report", May 2006, prepared by Delaware Engineering.

9. "Final Facility Decommissioning and Closure Plan Report", March 2007, prepared by C&D Technologies, Inc.

10. "Tributary D-1-7 Sediment Data Report", June 2007, prepared by Delaware Engineering.

11. "Soil and Pavement Soil Sample Lead Results Report", September 2008, prepared by Delaware Engineering.

12. "Soil and Pavement Soil Sample Lead Results Report", October 2009, prepared by Delaware Engineering.

13. "Feasibility Study Report", August 2014, prepared by Delaware Engineering.

14. Letter dated March, 2, 2015 from Alfred Fusco.

15. Email dated March 12, 2015 from Frank Demuth.