# RECORD OF DECISION AMENDMENT

## for the

## Vestal Water Supply Well 1-1 Superfund Site

## Town of Vestal

## Broome County

## New York

United States Environmental Protection Agency
Region 2
New York, New York

September 2016

# DECLARATION FOR AMENDMENT TO RECORD OF DECISION

## SITE NAME AND LOCATION

Vestal Water Supply Well 1-1 Superfund Site
Town of Vestal, Broome County, New York

Superfund Site Identification Number: NYD980763767
Operable Unit 02

## STATEMENT OF BASIS AND PURPOSE

This decision document presents an amendment to the September 1990 Record of Decision (ROD) Operable Unit Two (OU2) for the Vestal Water Supply Well 1-1 Superfund Site (Site). This remedy is being chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. Sections 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300. This decision document (ROD Amendment) explains the factual and legal basis for selecting the amended remedy for the Site. The attached index (see **Appendix III**) identifies the items that comprise the administrative record upon which the amended remedy is based.

The New York State Department of Environmental Conservation (NYSDEC) was consulted on the proposed amended remedy, in accordance with CERCLA Section 121(f), 42 U.S.C. Section 9621(f), and concurs with the amended remedy (see **Appendix IV**).

## ASSESSMENT OF THE SITE

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

## DESCRIPTION OF THE SELECTED REMEDY

The remedy selected in this OU2 ROD Amendment actively addresses soil contamination located at 200 Stage Road within the Stage Road Industrial Park in Vestal, New York. All other components of the remedy selected in the 1990 ROD are either complete or remain unchanged by this ROD Amendment.

The major components of the amended OU2 remedy for the Site include the in situ thermal treatment (ISTT) of approximately 28,000 cubic yards of soils contaminated with volatile organic compounds (VOCs) in Area 3 and Area 4; the excavation and off-Site disposal of approximately 730 cubic yards of soils contaminated with polychlorinated biphenyls (PCBs) in Area 3 and the implementation of institutional controls (ICs) to restrict certain uses of 200 Stage Road.

The selected remedy is as follows:

ISTT:

- Treatment of VOC-contaminated soils utilizing Thermal Conductive Heating, Steam Enhanced Extraction, Electrical Resistance Heating or some combination of these three ISTT technologies based upon remedial design (RD) evaluation.
- Installation of sheet piling, if determined to be necessary during the RD, prior to any thermal treatment in order to reduce groundwater flow in the more transmissive zones of the subsurface environment.
- Installation of treatment wells beneath the building, if determined necessary during the RD, utilizing appropriate methods that would limit impacts to the building (*e.g.*, via directional drilling).
- Monitoring of temperature and pressure to track subsurface heating, pneumatic, and hydraulic control.

PCB Excavation:

- Pre-design sampling to identify the limits of PCB-contaminated soils excavation.
- Decommissioning of existing monitoring wells (those within and around the excavation footprints).
- Installation (and removal) of sheet piling and associated tie-backs.
- Excavation dewatering.
- On-Site treatment of contaminated groundwater that is collected as part of any necessary dewatering operations and subsequent discharge to a publicly-owned treatment works or permitted outfall.
- Excavation of soils to a depth of approximately 10 feet yielding approximately 730 cubic yards of soils.
- Transport and off-Site disposal of excavated soils, in accordance with applicable requirements under the Resource Conservation and Recovery Act, 42 U.S.C. § 6901-6992k and the Toxic Substances Control Act, 15 U.S.C. §§ 2601-2687.
- Backfilling excavations with clean fill, along with appropriate restoration (e.g., asphalt paving, topsoil, seeding).

ICs:

- Reliance on governmental ICs in the form of the commercial/light industrial zoning that is currently in place at 200 Stage Road. Other ICs, including proprietary or contractual, also may be utilized.

- Development of an Institutional Control Implementation and Assurance Plan to monitor, maintain and enforce ICs.

In accordance with Section 121(c) of CERCLA, statutory reviews will be conducted no less often than once every five years to ensure that the remedy is, or will be, protective of human health and environment.

The environmental benefits of the selected remedy may be enhanced by consideration, during the RD, of technologies and practices that are sustainable in accordance with the both the Environmental Protection Agency Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy. This will include consideration of green remediation technologies and practices.

## DECLARATION OF STATUTORY DETERMINATIONS

The amended remedy meets the requirements for remedial actions set forth in CERCLA §121. It is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action and is cost-effective. The amended remedy utilizes permanent solutions, alternative treatment technologies or resource recovery technologies to the maximum extent practicable and satisfies the statutory preference for treatment as a principal element of the remedy, *i.e.*, reduces the toxicity, mobility or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment.

## ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary of this ROD Amendment. Additional information can be found in the administrative record for this Site.

- A discussion of the current nature and extent of soil contamination is included in Section 5.0: "Summary of Site Characteristics."
- Chemicals of concern and their respective concentrations may be found in Section 5.2: "Characterization of Area 3 and Area 4."
- Current and reasonably-anticipated future land use assumptions are discussed in Section 6.0: "Current and Potential Future Land and Resource Uses."
- Potential adverse effects associated with exposure to Site contaminants may be found in Section 7.0: "Summary of Site Risks."
- A discussion of remediation goals for chemicals of concern may be found in Section 8.0: "Remedial Action Objectives."
- Estimated capital, annual operation and maintenance and total present-worth costs are discussed in Section 9.0: "Summary and Description of Remedial Alternatives."

- Key factors in the detailed analyses of remedial alternatives (*e.g.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria) may be found in Section 10: "Comparative Analysis of Alternatives" and Section 13: "Statutory Determinations."

**AUTHORIZING SIGNATURE**

Walter E. Mugdan, Director
Emergency and Remedial Response Division

September 30, 2014
Date

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## DECISION SUMMARY

## 1. SITE NAME, LOCATION, AND DESCRIPTION

The Vestal Water Supply Well 1-1 Site (Site) (see **Figure 1**) is located in the Town of Vestal, southwestern Broome County, New York, approximately 10 miles west of Binghamton, New York and includes a western portion and an eastern portion. The western portion is located between the Susquehanna River and New York State Route 17, includes a wellfield (Vestal Water District No. 1 Well 1 or Well 1-1, located on Pumphouse Road), a fire department training center, state-owned forest lands and a recreational field. Well 1-1 and contaminated groundwater impacting Well 1-1 are addressed as Operable Unit One (OU1). The eastern portion of the Site, the Stage Road Industrial Park (SRIP), is approximately 1500 feet southeast of Well 1-1 and has been designated as Operable Unit Two (OU2). The portion of the Site that is the subject of this OU2 Record of Decision (ROD) Amendment is located within the SRIP and is referred to herein as 200 Stage Road which is approximately 5.5 acres in size and is generally flat. 200 Stage Road is approximately 1,180 feet south of the Susquehanna River (within the 500-year flood plain).

Four areas located within the SRIP, identified as Areas 1-4, were originally investigated in OU2 as potential sources of contamination to Well 1-1. The four areas (see **Figure 2**) identified are as follows:

- <u>Area 1</u>- the part of the Vestal Asphalt property adjacent to Route 17.
- <u>Area 2</u>- the truck parking area between Stage Road and the Erie Lackawanna railroad tracks.
- <u>Area 3</u>- the area of 200 Stage Road between the north side of the Chenango Industries building and an existing drainage ditch.
- <u>Area 4</u>- the area of 200 Stage Road between the south side of the Chenango Industries building and the Erie Lackawanna railroad tracks.

These four areas were suspected of being areas of contamination where volatile organic compounds (VOCs) were present in the soils and entering the groundwater, based primarily on the concentrations of VOCs found in the groundwater.

This ROD Amendment focuses on changes to the remedy selected for the source areas at 200 Stage Road. 200 Stage Road is zoned for and is expected to continue to be zoned and used for commercial/light industrial activities. 200 Stage Road includes a 60,000 square foot building that was formerly used to manufacture transformers and, later, electronic circuit boards. The circuit board manufacturing operations ceased in May 2002. From 2007 through 2013, the building was used to recycle electronic equipment. Currently, the building is being used for automotive work, including repair, painting and restoration of vehicles. As shown on **Figure 2**, Area 3 and Area 4 are located adjacent to the building at 200 Stage Road and are considered to be current sources of groundwater contamination. Area 3 is located on the northeast side of the building. Area 4 is located along the entire southern perimeter of the building, primarily within the asphalt-covered parking lot areas.

## 2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

In 1978, a chemical spill (or leak) occurred from an underground storage tank at the IBM Endicott facility, located on the north side of the Susquehanna River (approximately one mile north of the Site). In response to the spill, all drinking water supply wells in the area were tested for synthetic organic chemicals. Water samples from Well 1-1 were found to contain high concentrations of VOCs; and, subsequently, the well was taken out of service and pumped to the Susquehanna River. Subsequent investigation determined that the presence of chlorinated solvents in Well 1-1 was not related to the spill at the IBM plant but rather originated from the SRIP area.

The Site was formally added to the National Priorities List on September 8, 1983.

Operable Unit One

In April, 1985, the NYSDEC began a remedial investigation/feasibility study (RI/FS) for OU1 which focused on the groundwater at the Site. Completed in 1986, the RI/FS and risk assessment confirmed the presence of VOCs in the groundwater southeast and east of Well 1-1 and identified a future risk to residents consuming drinking water contaminated with trichloroethene or TCE. The contaminants of concern (COCs) identified in the risk assessment for the ingestion of groundwater were primarily the VOCs: 1,1,1-trichloroethane or TCA, TCE, cis-1,2-dichloroethene or DCE and 1,1-dichloroethane or DCA.

In June 1986, based on the OU1 RI/FS and the risk assessment, the Environmental Protection Agency (EPA) issued the OU1 ROD. The major components for the selected remedy included:

- Construction of a packed column air stripping system on Well 1-1 in order to return the well to full service as Vestal Water District l's primary water supply.

    - Restoration of District 1 water supply capacity to the level that existed prior to loss of Well l-1.
    - Provision of a water supply to the district that exceeds applicable or relevant and appropriate standards, thereby providing a very high level of public health protection.
    - Hydraulic containment of the plume of contaminants via pumping Well 1-1, hereby protecting other District l water supply wells.
    - Cessation of untreated discharge from Well 1-1 to the Susquehanna River.

- Initiation of a supplemental RI/FS to investigate further the extent of soil contamination in the suspected source areas and to evaluate possible source control measures.

In May and June 1988, EPA sent Special Notice letters to Vestal Asphalt, Inc. and Chenango Industries, Inc. These letters were intended to provide official notification from EPA to individuals or corporations of their status as potentially responsible parties (PRPs) for a release of contamination and for the cleanup deemed necessary by EPA. The basis for this notification was that the potential source Area 1 was partially within the Vestal Asphalt property, potential source Area 3 and Area 4 were located on the Chenango property, and potential source Area 2 was partially within a truck parking area owned by the New York State Department of Transportation but predominantly used by Vestal Asphalt, Inc. At the time, neither Chenango Industries nor Vestal Asphalt, Inc. expressed a willingness to negotiate a settlement that would provide for their implementation of the selected remedy for OU1. As a result, in May 1989, EPA began construction of the air stripping facility which was completed in July 1990. In December 1993, as a result of poor performance of the aged Well 1-1, Well 1-1 was abandoned and a new well, Well 1-1A, was installed with a maximum pumping capacity of 1150 gallons per minute (gpm), averaging 300 to 500 gpm.

In March 1995, EPA issued a remedial action report which determined that Well 1-1A and the associated air stripping facility were fully operational and functional as a potable water supply. In May 1995, the Town of Vestal indicated that it no longer required the water from Well 1-1A for its drinking water supply. EPA performed the first 10 years of the long-term response action (LTRA) to treat the extracted groundwater and discharge the treated water from Well 1-1A to the Susquehanna River before concluding the LTRA and transferring the operation and maintenance (O&M) of the treatment system to NYSDEC.

In 2006, NYSDEC assumed responsibility for the O&M of the groundwater extraction and treatment facility for Well 1-1A. In 2014, NYSDEC performed a remedy system optimization (RSO) for the groundwater remedy in order to evaluate the current OU1 remedy. Even though the treatment system was effective in treating the contaminated groundwater down to maximum contaminant levels (MCLs), the groundwater concentrations within the aquifer appeared to staying at the same levels as indicated by various monitoring well data in the area. This indicated that a continuing source of groundwater contamination, *i.e.*, contaminated soils, was still present. Also, the well was pumping in fresh water from the Susquehanna River and not revealing the true contaminant concentrations present in the groundwater. The RSO determined that continued operation of the treatment facility was no longer necessary to protect the operating Vestal public water supply wells from the groundwater plume. Vestal current public water supply wells (Vestal 1-2A and 1-3) are approximately 1500 feet west of the treatment facility and are both fitted with treatment units.

Operable Unit Two

In November 1988, EPA conducted the OU2 RI/FS for the four areas of concern in the SRIP (Areas 1-4). The results of the RI/FS revealed significant VOC contamination in subsurface soils located in Area 2 and Area 4 and limited soil contamination in Area 1 and Area 3. Most of the subsurface contamination was determined to reside between five and 25 feet below ground surface (bgs) with the highest VOC concentrations at depths greater than 10 feet.

EPA completed an OU2 risk assessment identified unacceptable risks to future construction workers exposed through ingestion and dermal contact with the contaminated soils and inhalation of VOCs in Area 2 and Area 4. In addition, the risk assessment identified unacceptable risk to residents within the entire Site area from the ingestion of groundwater contaminants which were leaching from the soils. Potential exposure pathways considered were ingestion of groundwater from directly below source Area 2 and Area 4 and from Well 1-1.

VOCs, including TCE, TCA, DCE, DCA and tetrachloroethene or PCE were identified as contributing to the health risks to construction workers and to residents.

The OU2 ecological risk assessment determined that it was unlikely that the soil and groundwater contamination in the study area had adversely affected any plant life in the study area, particularly in the wetlands, as a result of the considerable depths at which the higher concentrations of contaminants had been detected (*i.e.*, below root levels). As a result, EPA considered the study area to have limited ecological significance to both flora and fauna. Based on the RI/FS and risk assessment, EPA signed a ROD for OU2 on September 27, 1990 which addressed the contaminated soils located in the two discrete source areas, Area 2 and Area 4. At that time, no action was deemed to be warranted for Area 1 and Area 3.

The major components of the selected remedy included:

- In situ vacuum extraction or soil vapor extraction (SVE) of volatile organic contamination from soil in source Area 2 and Area 4 within the SRIP followed by carbon adsorption, with subsequent treatment and disposal of contaminated carbon at a permitted off-Site facility.
- Monitoring program to evaluate the progress of the SVE remedy.
- Monitoring program to periodically assess inorganic contaminants in the aquifer upgradient of Well 1-1 for groundwater.
- A contingency remedy involving additional inorganic treatment at Well 1-1, if necessary, in the future.

In March 1991, EPA issued a unilateral administrative order (UAO) to three PRPs (American Board Companies, C. I. Liquidators of New York and Great American Industries) for the performance of the remedial design/remedial action (RD/RA) at Area 4. Two of the PRPs (Great American Industries and C. I. Liquidators of New York) initially complied with the order by performing the RD. Subsequently, however, they indicated that financial constraints prevented their full compliance with the UAO. As a result, EPA assumed performance of the RA. In May 1999, EPA entered into a judicial consent decree with the three PRPs (*United States v. American Board Companies, Inc., et al.*, No. 99-CIV-0435 (N.D.N.Y.)). Great American Industries and C. I. Liquidators of New York agreed to pay EPA ($775,000) towards the future response costs for the remediation of the Area 4 contaminated soils. American Board Companies agreed to provide EPA with access to 200 Stage Road.

In January 1997, as per the OU2 1990 ROD, the SVE system, designed to remove VOCs from the unsaturated soils, began operation in Area 2. In December 1997, four additional vertical SVE wells were installed to extend the treated area to the contaminated soils in the eastern portion of Area 2. In November 2000, the SVE was terminated in Area 2 as a result of successfully achieving the ROD soil cleanup levels. During September and October 2001, soil sampling was performed in Area 4 to delineate further the area of contamination. In June 2003, the SVE system, similar to that in Area 2, began operating in Area 4.

In February, September and October 2005, as a result of low VOC contaminant removal rates, EPA conducted further soil and groundwater sampling at the Site to evaluate the progress of the

SVE system in cleaning up Area 4. The results of the sampling showed that very high levels of VOCs still remained in the deep unsaturated and shallow saturated zones. In January 2006, the SVE system was temporarily shut down in order to determine if any modifications to the SVE system could achieve OU2 soil cleanup levels. Subsequently, EPA determined that, without enhancement, the SVE system for Area 4 would be unable to address the remaining VOC contamination in the fine-textured soils at the Site.

## 3. COMMUNITY PARTICIPATION

On August 22, 2016, EPA released for public comment the Proposed Plan for the amended remedy for the Site. EPA assembled supporting documentation, which comprises the administrative record, and made it available to the public at the information repositories maintained at the Vestal Public Library, 320 Vestal Parkway, East Vestal, New York and EPA Region 2 Office in New York, New York.

On August 22, 2016, a public notice was published in the *Press and Sun Bulletin* announcing the start of the public comment period and the availability of the above-referenced Proposed Plan. A copy of the public notice can be found in **Appendix V**. EPA accepted public comments on the Proposed Plan from August 22, 2016 through September 23, 2016.

On August 30, 2016, EPA held a public meeting at the Vestal Town Hall, located at 605 Vestal Parkway West, Vestal, New York, to inform local officials and interested citizens about the Superfund process, to present the Proposed Plan for the Site, including the preferred proposed remedial alternatives, and to respond to questions and comments from the attendees. Comments received at the public meeting and in writing during the public comment period are summarized and addressed in the Responsiveness Summary (See **Appendix V**).

## 4. SCOPE AND ROLE OF RESPONSE ACTION

This Site is being addressed in two operable units.

- OU1 addresses VOCs in contaminated groundwater and the Well 1-1 drinking water supply.
- OU2 addresses VOC-contaminated soils in discrete source areas at the Site that have impacted groundwater, as well as additional soil contamination from PCBs.

As noted above, the groundwater treatment system for OU1 has been constructed but is presently not operating.

The OU2 ROD selected the treatment of soil contamination, using soil vapor extraction (SVE), in two of the four investigated source areas, Area 2 and Area 4. At the time of the ROD, active remediation in Area 1 and Area 3 was not believed to be necessary. Remediation of contaminated soils in Area 2 was successfully completed in November 2000. In 2003, a larger, full-scale SVE system was installed in Area 4. However, after operating the system for several years, it was determined that SVE would not be able to achieve cleanup objectives in portions of Area 4 without some enhancement because of the fine-textured nature of the soils found in Area 4. SVE technology alone is unsuitable for fine-textured soils and/or saturated soils since these conditions limit the radius of influence of the SVE system. Additional evaluation of the soils was performed at the Site in order to characterize further the Area 4 soils to determine what technologies could be used to achieve cleanup objectives in this area; this evaluation also led to the identification of additional contamination in Area 3. This amendment to the OU2 ROD addresses the remaining soil contamination in Area 3 and Area 4.

## 5. SUMMARY OF SITE CHARACTERISTICS

### 5.1 Site Geology/Hydrogeology

The Town of Vestal is situated in a low-lying, relatively flat area of the Susquehanna River basin. Vestal is bordered to the east, south and west by moderately rolling, hilly terrain. Elevations range from approximately 810 feet above mean sea level (AMSL), along the Susquehanna River, to approximately 1,831 feet AMSL, south of Vestal. Vestal is located within the glaciated Appalachian Plateau Physiographic province. Glacial deposits in the area can be subdivided into three types: glacial till, glaciofluvial and glaciolacustrine deposits.

Within the source areas at the Site, a number of distinct stratigraphic units are known to occur based on examination of records and drilling logs from previous investigations. The individual units are briefly described below:

Post-Glacial Alluvial Deposits and Fill: Primarily silt and clay with occasional inter-bedded lenses of sand and infrequent gravel. Surficial silty "fill" material occurs from approximately 0 to 5 feet bgs in most areas of the Site. The average thickness of this layer is approximately 19 feet. The horizontal hydraulic conductivity of these unconfined deposits ranges from approximately 0.04 to 1.4 feet per day (based on slug tests in on-Site wells, literature values and results from groundwater modeling conducted by EPA's Environmental Response Team (ERT)).

Upper Glaciofluvial Sand & Gravel Deposits: As the name denotes, this is a mixture comprised of sand and gravel. The average thickness beneath the Site is approximately 18.5 feet. The horizontal hydraulic conductivity of these semi-confined deposits ranges from approximately 120 to 380 feet per day. Groundwater velocities within this layer have been estimated to range from approximately 5 to 15 feet per day (based on limited slug test results, literature values, and ERT groundwater modeling). Note: Additional slug testing of wells screened in this unit will be necessary in the future in order to more accurately define the range in conductivities within the source areas.

Glacial Till: An un-stratified mixture of sand, silt, clay, and gravel. The average horizontal hydraulic conductivity of this leaky-confined layer is estimated to be less than 1-foot per day (based on ERT groundwater modeling).

Bedrock: The bedrock is comprised of shale and siltstone; the upper 10 to 15 feet is highly weathered and broken. Fractures and bedding planes form a small part of the unweathered rock volume and provide the only significant void spaces in which water can be stored and transmitted. The horizontal hydraulic conductivity of this upper, leaky-confined layer is estimated to range from less than 1 foot per day to approximately 3 feet per day (based on literature values and ERT modeling results).

Groundwater generally flows in a west/northwest direction across the Site (toward Vestal Wells 1-1 and 1-1A) with a horizontal gradient of approximately 0.009 feet per foot (ft/ft). The water table depth on Site has an average range from approximately 12 to 14 feet bgs.

### 5.2 Characterization of Area 3 and Area 4

The evaluation of the nature and extent of contamination for the OU2 ROD Amendment focuses on Site-related contaminants, including non-aqueous phase liquids (NAPLs)[1], that were identified during the extensive remedial investigation of 200 Stage Road (both outside the building and underneath the building) that EPA ERT conducted from 2006 until 2014. The investigations identified additional COCs, including elevated soil contamination, beyond those identified in the OU2 ROD. **Figure 3, 4 and 5** show the extent of EPA's investigation of 200 Stage Road. EPA documented its investigation of contaminated soils located in Area 3 (northeast portion of 200 Stage Road) and Area 4 (southern portion of 200 Stage Road) in the Conceptual Site Model (CSM) report which is the remedial investigation report for the Site.

**Figure 6** illustrates the lateral extent of the primary COCs in Area 3 and Area 4 at 200 Stage Road. **Tables 1- 4** identify the COC (VOCs and PCBs) soil data for Area 3 and Area 4 for the 2010 through 2014 period. Data from soils sampling that was conducted prior to 2010 can be found in Appendix B of the CSM in the Administrative Record. Most of the contamination resides between five and 25 feet bgs. At the northeast corner of the building, most of the contamination is between five and 20 feet bgs. As shown on **Figure 6**, the Focused Feasibility Study (FFS) divided 200 Stage Road into two separate targeted treatment zones for Area 3 and three separate zones for Area 4. For Area 3, the zones are Area 3 (outside the northeast corner of the building) and Area 3B (under the northeast corner of the building). For Area 4, the zones are Area 4-1 (the south side of the building – western parking lot); Area 4-2 (the south side of the building – eastern parking lot; and, Area 4-2B (under the south side of the building).

The primary COCs at the Site include the following:

- 1,1,1-TCA
- TCE
- cis-1,2-DCE
- 1,2,4-trimethylbenzene (1,2,4-TMB)
- 1,3,5-TMB
- PCBs

*[1] Non-Aqueous Phase Liquid or "NAPL" is a contaminant that can be classified as either light non-aqueous phase liquid or "LNAPL", i.e., lighter than water, or dense non-aqueous phase liquid or "DNAPL", i.e., denser than water. These products can exist in either groundwater, soils or both.*

1,1,1-TCA, TCE and cis-1,2-DCE are the primary COCs identified in Area 4. 1,2,4-TMB, 1,3,5-TMB and PCBs are the primary COCs identified in Area 3. 1,1,-TCA and TCE were also found in Area 3 but at much lower concentrations than in Area 4.

The selection of the above contaminants as primary COCs is based on 1) frequency of detection, 2) wide-spread occurrence in soils, 3) higher concentrations relative to other contaminants found at the Site and 4) need for remediation. Additionally, based on their overall physical properties, the above contaminants (excluding PCBs) are considered to be representative of other VOCs detected at the Site.

During August and September 2006, 56 soil borings were drilled at the Site as an initial effort for defining the extent of subsurface contamination. A total of 133 soil samples was collected for VOC analyses.

In November and December 2007, an additional 54 soil borings were drilled at the Site to define the horizontal and vertical extent of subsurface contamination. A total of 153 soil samples were collected for analysis of VOCs.

During May and June 2008, four monitoring well clusters (ERT-1 through ERT-4) were installed at the Site to assess concentrations of VOCs in groundwater with depth. In July 2008, as part of this field effort, nine soil borings, all 20 feet in depth, were drilled around the northeast corner of 200 Stage Road to investigate the extent of subsurface contamination within this area, based on initial detections in previous borings. A total of 39 soil samples were collected from the nine borings for analysis of VOCs.

EPA's investigation also identified the presence of residual LNAPL within the subsurface in Area 3. Some LNAPL was also detected in two wells, ERT-1S and MW-F. A groundwater sample from this well indicated that VOCs were present, as well as, petroleum hydrocarbons, *e.g.*, 1,2,4-TMB and 1,3,5-TMB, and semi-volatile organic compounds (SVOCs) which include several polycyclic aromatic hydrocarbons (PAHs).

In March 2009, eight additional soil borings were drilled around the northeast corner of 200 Stage Road (Area 3) to characterize further the nature and extent of subsurface VOC contamination. A total of 27 soil samples were collected for analysis of VOCs.

During June and July 2009, five 1.5-inch diameter polyvinyl chloride (PVC) monitoring wells were installed around the northeast corner of 200 Stage Road (Area 3) to define the extent of LNAPL source contamination within this area. Three deep 2-inch diameter PVC monitoring wells were additionally installed during this investigation to assess VOC concentrations in groundwater within the weathered bedrock beneath the Site. A total of 20 soil samples were collected from the borings associated with the deep wells for analysis of VOCs and PCBs.

In May 2010, four 2-inch stainless steel monitoring wells were installed on the northeast side of 200 Stage Road (near well ERT-1S) to delineate the horizontal extent of the LNAPL within this area. One additional 2-inch PVC monitoring well was installed along the northwest side of the building to monitor groundwater quality within deeper strata, *i.e.*, lower glacial till and upper weathered bedrock.

In December 2012, over 250 soil samples were collected from 44 borings to characterize the horizontal and vertical extent of additional COCs at 200 Stage Road, namely, PCBs and SVOCs. A total of 13 surface samples (between zero and one-foot depth) were additionally collected at 13 borehole locations for analysis of VOCs. The results of this investigation, along with previously acquired data, were used to support the human health risk assessment for the Site.

In July 2013, nine directional or horizontal borings were drilled beneath the northeast corner of 200 Stage Road (Area 3) to assess the horizontal and vertical extent of contamination in subsurface deposits. An additional 18 subsurface samples were collected for analysis of PCBs and SVOCs.

In Area 4, TCA and TCE were the most prevalent contaminants and exhibited the highest concentrations. These VOC concentrations were detected in the 10-to-20 foot depth range where fine-textured soils and the capillary fringe of the aquifer exist. VOCs were detected in two areas of the parking lot (Areas 4-1 and 4-2), located on the south side of 200 Stage Road, underneath the building at 200 Stage Road (Areas 3B and 4-2B) and in the northeast corner of 200 Stage Road (Area 3).

The highest concentration of TCA detected in the Area 4 parking lot was 23,600 milligrams per kilogram (mg/kg) found at approximately 17.5 feet bgs and of TCE was 13,000 mg/kg found at approximately 16.5 feet bgs. These high concentrations indicate the presence of DNAPL within the soil matrix. DNAPL is not soluble in water, denser than water and continues to present an ongoing source of VOC contamination to the soils.

The VOC-contamination identified at 200 Stage Road appears to be limited to 1) an area approximately 20 feet long by less than 10 feet wide in the eastern area of the parking lot (Area 4-2) and 2) an area approximately 25 feet by 20 feet in the western area of the parking lot (Area 4-1). Lower levels of VOCs were also detected beneath the building (Area 4-2B), with TCA detected up to 83 mg/kg and TCE detected up to 108 mg/kg.

In the northeast corner area of 200 Stage Road building (Area 3), the highest concentrations detected of TCA, TCE and 1,2,4-TMB were 5.9 mg/kg, 244 mg/kg and 107 mg/kg, respectively.

The highest concentration detected of DCE, 1,3,5-TMB and 1,2,4-TMB in unconsolidated deposits in Area 3 are as follows:

- DCE – 19.8 mg/kg, average depth at around 17 feet.
- 1,3,5-TMB – 45.9 mg/kg, detected at around 6.9 feet.
- 1,2,4-TMB – 107 mg/kg, detected at around 9.5 feet.

In Area 3, the depths of PCB soil samples ranged from approximately five to 20 feet with concentrations ranging from 0.13 to 31.4 mg/kg. In Area 3, total PCBs sampled below one foot only exceeded 10 mg/kg in one sample only. Because PCBs are known to be present in the LNAPL in Area 3, their extent would essentially be limited to the extent of the LNAPL (approximately 110 cubic yards). The presence of PCBs is believed to result from their association with NAPLs that were previously released to (or spilled onto) the ground surface. Other chemicals or compounds in the NAPLs could have increased the mobility of PCBs (through co-solvency), which caused them to vertically migrate through the shallow unconsolidated deposits.

In Area 4, approximately 120 cubic yards of DNAPL contained in the soils, is located in the western parking lot area (Area 4-1) and approximately 160 cubic yards of DNAPL, contained in the soils, is located in the eastern parking lot area (4-2).

EPA's Site characterization identified the spatial distribution of contaminants in Site soils at 200 Stage Road (*i.e.*, unconsolidated deposits) based on approximately 640 samples collected from 180 borings that were advanced up to 30 feet bgs. Analytical results indicate the presence of all COCs in Area 3, while all COCs except TMBs and PCBs were present in Area 4.

EPA has also collected VOC data as it relates to subslab vapors and indoor air at the 200 Stage Road building. Since 2007, EPA has been performing biennial subslab and indoor air sampling at various locations inside the 200 Stage Road building. With respect to subslab and indoor air concentrations inside the building, TCE is the primary COC. The 2015 data show that, although TCE concentrations in vapors under the subslab of the building were above EPA's screening levels, TCE concentrations at 14 indoor air monitoring locations were below industrial screening levels with the exception of the results for one sample location that was at the industrial screening level. The indoor air and subslab sampling results are regularly transmitted to the building owner/manager. It should be noted that, in 2013, EPA sampled four additional buildings on three other properties in the SRIP. Based upon results from this sampling, EPA decided to add two of the four buildings to its biennial sampling program. Results of 2014 and 2015 sampling at these buildings did not indicate the presence of VOCs in indoor air above screening levels.

## 6. CURRENT AND POTENTIAL FUTURE LAND AND RESOURCE USES

### 6.1 Land Use

The SRIP is currently zoned for commercial/light industrial activities. It is anticipated that the SRIP and 200 Stage Road will continue to be zoned and used for commercial/light industrial activities.

### 6.2 Groundwater Use

Vestal Water Supply Wells 1-1 and 1-1A are no longer used for drinking water purposes. The Town of Vestal currently now uses public water supply wells (Vestal 1-2A and 1-3), which are approximately 1500 feet west of the Well 1-1A treatment facility. For both wells, influent water is treated prior to distribution to the community.

## 7. SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site or operable unit in the absence of any actions or controls to mitigate such releases, under current and future land and resource uses. The baseline risk assessment includes a human health risk assessment (HHRA) and an ecological risk assessment (BERA). It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for the site.

Human Health Risk Assessment

EPA conducted a baseline HHRA in order to estimate the cancer risks and noncancer hazards associated with the current and future effects of contaminants on human health and the environment. A baseline HHRA is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or to mitigate such exposure under current and future land uses. EPA's evaluation of potential exposure during the development of a risk assessment uses the term Chemicals of Potential Concern or COPCs.

A four-step human health risk assessment process was used for assessing Site-related cancer risks and noncancer health hazards. The four-step process is comprised of: Hazard Identification of COPCs, Exposure Assessment, Toxicity Assessment, and Risk Characterization.

The baseline HHRA began with selecting COPCs in surface and subsurface soils that could potentially cause adverse health effects in exposed individuals.

Numerous studies have documented the presence of VOCs in surface and subsurface soils at this Site; (SVOCs) and (PCBs) were also identified as being present. Future residents, although unlikely, as well as current and future outdoor workers or trespassers may be exposed to surface soils (e.g., depths of zero to one foot) at the Site through incidental ingestion, dermal contact, and/or inhalation. Construction workers may be exposed to both surface and and/or inhalation. Construction workers may be exposed to both surface and subsurface soils (from zero to 10 feet) at the Site through incidental ingestion, dermal contact and/or inhalation of COPCs in soils. Exposure to groundwater through consumption of tap water was previously addressed in the 1986 OU1 ROD.

### 7.1 Human Health Risk Assessment Process

The Site-specific HHRA estimated cancer risks and noncancer health hazards from exposures to chemicals at the Vestal Water Supply 1-1, Superfund Site, focusing on 200 Stage Road. The HHRA quantitatively evaluates cancer risks and noncancer hazards from surface and subsurface soil. A Site-specific HHRA was developed for OU2 - Area 4. Consistent with EPA's policies and guidance, the baseline HHRA quantified cancer risks and noncancer hazards as the total exposure to COPCs in the absence of remedial action and institutional controls (ICs).

Risk Assessment Definitions and Process.

A four-step process is used for assessing site-related human health risks for a reasonable maximum exposure (RME) scenario. The process includes:

- *Hazard Identification* – uses the analytical data collected to identify the COPCs at the site for each medium with consideration of a number of factors explained below.
- *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated soils) by which humans are potentially exposed.
- *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response).
- *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks The risk characterization also identifies contaminants with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP), which outlines the regulations for implementing the Superfund program, as an excess lifetime cancer risk greater than $1 \times 10^{-6}$ – $1 \times 10^{-4}$ or a Hazard Index (HI) greater than 1.0; contaminants at these concentrations are considered COCs and are typically those that will require remediation at the site. Also included in this section is a discussion of the uncertainties associated with these risks.

## 7.2 Human Health Risk Assessment

Hazard Identification

In this step, the COPCs in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of VOCs, SVOCs, and PCBs at the site at concentrations of potential concern. Based on this information, the risk assessment focused on surface and surface and subsurface soils, and contaminants which may pose significant risk to human health.

Numerous studies have documented the presence of VOCs in surface and subsurface soils at this Site; SVOCs and PCBs were also identified as being present. A comprehensive list of all COPCs can be found in the HHRA in the administrative record. Only the COCs, or these chemicals requiring remediation at the Site, are listed in **Appendix II - Table 5**. PCBs were the primary COC at the Site in surface and subsurface soils (depths of 0 to 10 feet). The total HI for the RME for a construction worker is an HI = 2. This exceedance (HI>1) is primarily due to dermal exposure to the COC PCBs (primarily Aroclor-1260) in subsurface soil.

Exposure Assessment

Consistent with Superfund policy and guidance, as noted above, the HHRA is a baseline human health risk assessment and therefore assumes no remediation or ICs to mitigate or remove hazardous substance releases. Cancer risks and noncancer HIs were calculated based on an estimate of the RME expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site.

200 Stage Road (which includes Area 3 and Area 4) and other nearby properties are located within the SRIP, which is zoned for commercial/light industrial. These properties are likely to continue to be zoned and used for commercial/light industrial use. It is anticipated that the future land use for this area will remain consistent with current use. The baseline HHRA evaluated potential risks to populations associated with both current and potential future land uses

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for the soils. Exposure pathways assessed in the baseline HHRA for the exposure area in the soils, the exposure pathways evaluated focused on incidental ingestion of soils, dermal contact, and volatilization of COPCs. The HHRA evaluated potential direct exposures to future adult/child resident, outdoor worker, trespasser, and indoor worker exposed to surface and subsurface soils not managed under a Site Management Plan. The main exposure pathways and receptors were from the construction worker exposed to surface and subsurface soils. All exposure pathways evaluated in the HHRA are found in **Appendix II - Table 6**.

Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upper bound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in each medium can be found in **Appendix II – Table 5**, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the HHRA.

Toxicity Assessment

In this step, the types of adverse health effects associated with contaminant exposures and the relationship between magnitude of exposure and severity of adverse health effects were determined. Potential health effects are contaminant-specific and may include the risk of developing cancer over a lifetime or noncancer health effects, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some contaminants are capable of causing both cancer and noncancer health effects.

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the site-related chemicals would be additive. Thus, cancer risks and noncancer hazards associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and non-carcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with the May 2013 Tier 3 Toxicity Value White Paper (http://www.epa.gov/oswer/riskassessment/pdf/tier3-toxicityvalue-whitepaper.pdf). This information is presented in **Appendix II – Tables 7 and 8** (noncancer toxicity data summary) and **Appendix II - Table 9 and 10** (cancer toxicity data summary). Additional toxicity information for all COPCs is presented in the HHRA.

Risk Characterization

Non-carcinogenic hazards were assessed using the HI approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated soils) is compared to the RfD or the RfC to derive the hazarrd quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient;
Intake = estimated intake for a chemical (mg/kg-day); and
RfD = reference dose (mg/kg-day).

The intake and the RfD represents the same exposure period (*i.e.*, chronic, subchronic, or acute).

The key concept for a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur.

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for non-carcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI is calculated for all chemicals for a specific population that exceeds an HI = 1.0, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of an HI = 1.0 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. A summary of the non-carcinogenic hazards associated with these chemicals for each exposure pathway is contained in **Appendix II - Table 11.**

It can be seen in **Appendix II - Table 11** that the HI for noncancer effects for total PCBs is an HI = 2 (based on one significant figure) for the future construction worker exposed to soils at a depth of 0 to 10 feet; therefore, non-carcinogenic hazards may occur from the exposure routes evaluated in the HHRA. The non-carcinogenic hazards are attributable to PCBs in surface and subsurface soils. All other non-carcinogenic hazards associated with exposure to soils for various receptors are below EPA's goal of protection of an HI = 1.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (e.g., $1 \times 10^{-6}$) of an individual developing cancer;
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day); and
SF = cancer slope factor, expressed as [1/(mg/kg-day)].

These risks are probabilities that are usually expressed in scientific notation (such as $1 \times 10^{-4}$). An excess lifetime cancer risk of $1 \times 10^{-4}$ indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the acceptable risk range for site-related exposure is $10^{-6}$ (one in a million) to $10^{-4}$ (one in ten thousand).

Results of the HHRA presented in **Appendix II – Table 11** indicate that the cancer risks to the construction worker was $2.2 \times 10^{-5}$ which is within the risk range established by the NCP.

In summary, construction workers exposed to contaminated surface and subsurface soils at the Site had a noncancer HI = 2 from exposure to PCBs. The noncancer HI exceeds the goal of protection of an HI = 1. The noncancer health effect creates impacts to the immune system. The noncancer hazards and cancer risks from all COPCs can be found in the HHRA.

The results for noncancer health hazards from the HHRA are summarized in **Appendix II – Table 11** for the RME scenario. The HIs are above EPA's goal of protection of an HI equal to 1. All of the hazards associated with the RME for each area exceeding an HI = 1 for a specific health effect typically would require remedial action at a site or operable unit (**Appendix II – Table 11**).

The response action selected in the OU2 ROD Amendment is necessary to protect the public health or welfare of the environment from actual or threatened releases of contaminants into the environment.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry, sampling and analysis;
- environmental parameter measurement;
- fate and transport modeling;
- exposure parameter estimate; and
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Analytical error in environmental chemistry can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. In this assessment, using the use of exposure point concentrations (EPCs) for total Aroclors (based on assigning the maximum reporting limit across the individual Aroclors for each sample) to calculate noncancer HIs for the construction worker, results in HIs that are comparable to EPCs based on the individual Aroclors based on detected values only. The comparable HIs for total and individual Aroclors suggest that analytical error was not a significant concern in EPA's analyses.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the COCs, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the COCs at the point of exposure. In this assessment, the assumption regarding the time for construction was assumed to be 250 days/year which maybe an overestimate or underestimate of cancer risk and noncancer hazard depending on future plans for development.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the site, and is highly unlikely to underestimate actual risks related to the site.

The assessment also evaluated potential enhancement of cancer risks and noncancer hazards based on dioxin-like PCBs. The assessment of dioxin-like PCBs did not identify an enhancement of the risks associated with PCBs at the Site. This evaluation is further discussed in the HHRA.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the HHRA report which is part of the administrative record.

Impact to Groundwater

The OU1 and OU2 RODs addressed groundwater contamination with the intent of restoring the aquifer and containing the plume so that it would not impact nearby water supply wells. The soil concentrations in Area 4 are above the concentrations that are associated with an adverse impact to groundwater; thus, there is a need to address the soil contamination to protect the groundwater resource. A complete discussion of the risks and hazards can be found in the baseline HRRA.

### 7.3 **Ecological Risk Assessment**

The OU2 ROD indicated that study area was determined to have limited ecological significance to both flora and fauna. The ecological assessment for the Site addressed the potential impact on ecological receptors of soil contamination. Although elevated concentrations of VOCs and SVOCs at the Site were detected at considerable depths (*i.e.,* well below root levels), EPA requested that a focused screening level ecological risk assessment (SLERA) be conducted to evaluate potential ecological risk posed by surface soil contamination.

Surface soil concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. Food chain modeling using various exposure scenarios was also utilized to assess potential risks to upper trophic level receptors (vermivores). A complete summary of all exposure scenarios can be found in the SLERA.

Based on food chain calculations conducted in the SLERA, there is a potential risk to vermivorous birds using conservative exposure parameters for PCBs. Risk from exposure to PCBs were calculated for vermivorous mammals also using conservative parameters. Additionally, a potential ecological risk from several PAHs, including anthracene, fluoranthene, naphthalene, phenanthrene and pyrene even though they are not COCs for the Site, they will be addressed during the remediation for the VOCs.

### **7.4 Basis for Taking Action**

Based upon the results of the CSM and the risk assessments, EPA has determined that actual or threatened releases of hazardous substances from the Site may present a current or potential threat to human health or the environment if they are not addressed by the selected remedy.

## **8. REMEDIAL ACTION OBJECTIVES**

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance (TBCs) and the reasonably anticipated future land use for a site.

The specific RAOs identified for the Site in the 1990 OU2 ROD were as follows:

- Ensure protection of groundwater from the continued release of VOC contamination from soils.
- Ensure protection of Vestal Well 1-1 water quality from any groundwater contamination not addressed in the first operable unit.
- Ensure protection of human health, presumably that of Site workers who are exposed to contaminated soils through excavation.

The first and third RAOs identified above are applicable to the soils being addressed in this ROD Amendment. The second RAO was intended to ensure that if the potential existed for Well 1-1 to be impacted by metals contamination, appropriate measures would be taken. Monitoring subsequent to the issuance of the 1990 ROD for OU2, confirmed that Well 1-1 would not be impacted by metals contamination.

The revised RAOs for OU2 are as follows:

- Prevent and or minimize human and ecological exposures, including ingestion, inhalation and dermal contact to the contaminants present in soils.
- Ensure protection of construction workers who could be exposed to contaminated soils through excavation.
- Ensure protection of groundwater from the continued release of VOCs from soils.

EPA has adopted the Preliminary Remediation Goals (PRGs) that were identified in the Proposed Plan as the final Remediation Goals (RGs) for this OU2 ROD Amendment. RGs were selected that would both reduce the risk associated with exposure to soil contaminant to an acceptable level and ensure minimal migration of contaminants into the groundwater. The RGs for PCB-contaminated soils are consistent with EPA policy and NYSDEC Policy and its CP-51 Soil Cleanup Guidance. The RGs for VOCs are consistent with EPA policy and the NYSDEC soil cleanup objectives at 6 NYCRR Part375-6.8(b): Restricted Use Soil Cleanup Objectives for Protection of Groundwater and will eliminate the continued cross-media impacts from VOC contaminants in soils to groundwater.

**Table B. <u>Remediation Goals for OU2 - Area 3 and Area 4</u>**

| Contaminants of Concern (COCs) in Soils | Remediation Goals (mg/kg) |
|---|---|
| 1,1,1-Trichloroethane (TCA) | 0.68 |
| Trichloroethene (TCE) | 0.47 |
| cis-1,2-Dichloroethene (DCE) | 0.25 |
| 1,2,4-Trimethylbenzene (1,2,4-TMB) | 3.6 |
| 1,3,5-Trimethylbenzene (1,3,5-TMB) | 8.4 |
| Total PCBs (0 to 1 foot) | 1.0 |
| Total PCBs (greater than 1 foot) | 10.0 |

## 9. SUMMARY AND DESCRIPTION OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective and utilize permanent solutions, alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4). Chemical-specific, location-specific and action-specific ARARs are found in **Tables 12, 13 and 14**, respectively.

**Table C. Physical Extent of Expected Remediation**

| Areas | Primary COCs | Impacted Area ($ft^2$) | Impacted Soil Volume ($yd^3$) | Contaminant Mass (kg) |
|---|---|---|---|---|
| Area 4-1<br>Depth: 5-25 ft. | TCA<br>TCE | 8,457 | 6,264 | 874 |
| Area 4-2<br>Depth: 5-25 ft. | TCA<br>TCE | 9,419 | 6,977 | 715 |
| Area 4-2B<br>Depth: 5-25 ft. | TCA<br>TCE | 9,010 | 6,674 | 17 |
| Area 3<br>Depth: 5-20 ft. | 1,2,4-TMB<br>TCE<br>TCA | 12,839 | 6403 | ≤ 125 |
| Area 3<br>Depth: 5-10 ft. | PCBs | 1,517 | 730 | ≤ 10 |
| Area 3B<br>Depth: 5-20 ft. | TCE<br>DCE | 1,984 | 1,102 | < 1 |

Common Elements

There are common elements that are part of the two active soil remedial alternatives. With the exception of five-year Site reviews, the common elements listed below do not apply to the No Action alternatives. The common elements include the following:

Institutional Controls: A governmental IC in the form of the commercial/light industrial zoning that is currently in place at 200 Stage Road would be relied upon for both active remedial alternatives to help limit exposure to PCBs. Other types of ICs, including proprietary or contractual, also may be utilized. The original 1990 OU2 ROD did not include ICs as part of the selected remedy.

Five-Year Site Reviews: As required by Section 121(c) in CERCLA, alternatives resulting in contaminants remaining above levels that allow for unrestricted use and unlimited exposure require that a site be reviewed at least once every five years. For this OU2 ROD Amendment, both action alternatives require statutory reviews. If justified by the five-year review, additional response actions may be implemented to remove, treat or contain the contaminated soils. In addition, the whole Site is being reviewed at least once every five years because VOCs in groundwater have not yet achieved MCLs.

**Alternative R1: No Action**

| | |
|---|---|
| Capital Cost | $0 |
| Annual O&M | $0 |
| Construction Time | N/A |

A "no action" alternative is required by the NCP to provide an environmental baseline against which impacts of the various active remedial alternatives can be compared. Under this alternative, no further action would be taken to remedy the contaminated soils or to monitor contaminant concentrations to address the associated risks to human health or the environment. Because this alternative would result in contaminants remaining on-Site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

**Alternative R2: Excavation and Off-Site Disposal**

| | |
|---|---|
| Capital Cost | $39,223,160 |
| Present Worth | $39,223,160 |
| Annual O&M | $0 |
| Construction Time | ~12 months |

Under this alternative, contaminated soils in the source areas (Area 3 and Area 4) outside the 200 Stage Road building footprint would be excavated and transported off-Site for disposal at a Resource Conservation and Recovery Act (RCRA)-permitted Subtitle C or D landfill based on results of Toxicity Characteristic Leaching Procedure (TCLP) testing. All excavated areas would be backfilled with clean soils. In order to achieve the RGs for VOCs, approximately 32,000 cubic yards would need to be excavated and transported off-Site from Area 3 and Area 4. In order to achieve the RGs for PCBs, an additional 730 cubic yards of soils would need to be excavated from Area 3 only. **Figure 6** identifies the extent of the areas of contamination.

With the exception of PCBs around the northeast corner of the 200 Stage Road building, most of the contaminated areas are fairly well defined. Therefore, it is assumed that a pre-design investigation would only be necessary around the northeast corner of the building, prior to excavation, in order to delineate further the volume of PCBs in the subsurface.

Post-excavation samples in Area 3 would additionally be collected to verify that the RGs are achieved. Excavated material would be loaded into dump trucks and transported to a RCRA Subtitle C or D landfill for disposal, as applicable. If post excavation sampling shows that some contaminated soils are above 50 mg/kg PCBs, then this soils would need to comply with the disposal requirements of the Toxic Substance Control Act. For purposes of costing, it is assumed that 50% of the soils would require disposal at a RCRA Subtitle C (hazardous) landfill because of the high VOC concentrations in soils in some areas at 200 Stage Road.

In summary, this excavation and off-Site disposal alternative would include the following:

- Decommissioning of existing monitoring wells (those within and around the excavation footprints).
- Installation (and removal) of sheet piling and associated tie-backs.
- Excavation dewatering.
- On-Site treatment of contaminated groundwater that is collected as part of any necessary dewatering operations and subsequent discharge to a publicly-owned treatment works or other permitted outfall.
- Excavation and removal of contaminated soils.
- Trucking and off-Site disposal of contaminated soils, along with any ex situ pre-treatment (e.g. chemical oxidation, incineration), if required.
- Backfilling excavations with clean fill and place asphalt paving, topsoil, seeding, etc.

**Alternative R3: In Situ Thermal Treatment (ISTT) and Excavation and Off-Site Disposal**[2]

| | |
|---|---|
| Capital Cost | $14,500,000 |
| Present Worth | $14,500,000 |
| Annual O&M | $0 |
| Construction Time | 11-14 months |

Under this alternative, soil contamination would be addressed by ISTT and limited excavation and disposal. For the purposes of evaluation, comparison and costing, Thermal Conductive Heating (TCH) and Steam Enhanced Extraction (SEE) were used as the representative thermal technologies. However, Electrical Resistance Heating (ERH) or some combination of three processes may be considered during the RD phase. TCH can achieve very high contaminant removal efficiency in soils and SEE overcomes heat losses in soils where groundwater flow is greater than one foot per day, *i.e.*, sand & gravel deposits.

ERH delivers an electrical current between metal rods called “electrodes” installed underground. As movement of the current meets resistance from soils and converts the groundwater and the water in soils into steam, the heat generated vaporizes the contaminants. SEE injects steam underground by pumping it through wells drilled in the contaminated area. The steam heats the area and mobilizes and evaporates contaminants. TCH uses heaters placed

2 *Note: In the Focused Feasibility Study (FFS) Alternative R3 In Situ Thermal Treatment was limited to the VOC-contaminated soils at 200 Stage Road. The Proposed Plan and this ROD Amendment include in Alternative R3 both the ISTT of the VOC-contaminated soils and the excavation and off-Site disposal of the PCB-contaminated soils (which is part of Alternative R2 in the FFS).*

in underground steel pipes which heats the contaminated area hot enough to destroy or vaporize the COCs.

The conceptual ISTT approach includes:

- Installation of TCH heater wells (at a spacing of approximately 15 feet) with area-specific treatment temperatures.
- Application of steam to the sand & gravel (beneath the overlying alluvial deposits) to control heating.
- Extraction of soil vapor and steam from centroid multiphase extraction (MPE) wells and SVE wells to capture vaporized contaminants.
- Treatment of extracted liquid (condensate) and vapor using granular activated carbon (GAC), and monitoring for mass removal and discharge compliance.
- Monitoring of temperature and pressure to track subsurface heating, pneumatic, and hydraulic control.

Since there is a potential for significant groundwater flow within the subsurface remediation areas, which would adversely affect an ISTT remedy, it may be necessary to install sheet piling prior to any thermal treatment in order to reduce such groundwater flow in the more transmissive zones of the subsurface environment. This will be further evaluated during the RD.

If the treatment beneath the building is considered necessary in order to achieve the RGs, the installation of treatment wells beneath the building will be further evaluated during the RD.

Under the building only, all well types would either be installed either at an angle or horizontally (via directional drilling) in order to reach the treatment areas.

To achieve the RGs for VOCs, approximately 28,000 cubic yards of soils would need to be treated within Area 3 and Area 4, as shown in **Figure 6**.

To achieve the RGs for PCBs in Area 3, approximately 730 cubic yards of contaminated soils would be excavated down to approximately 10 feet bgs. The excavated soils would then be transported off-Site for disposal at a RCRA permitted Subtitle C or D landfill. To achieve the RGs for VOCs Area 3, ISTT would be used to address the remaining targeted treatment zone, subsequent to backfilling of clean soils in the excavation area for PCBs.

Because the Site geology is well-defined and the thermal technologies are well-proven, it is assumed that pre-design treatability testing, *i.e.*, pilot studies, would not be required prior to the implementation of the full-scale ISTT at the Site. Subsequent to the ISTT, post-remediation soil samples would be collected to verify that the RGs have been achieved.

It is also assumed that some pre-design sampling would be necessary in Area 3 in order to verify the exact nature and extent of PCBs in the subsurface.

## 10. COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in CERCLA Section 121, 42 U.S.C. § 9621, by conducting a detailed analysis of remedial alternatives pursuant to the requirements of the NCP at 40 C.F.R. § 300.430(e)(9), EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies*, OSWER Directive 9355.3-01, and EPA's *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents*, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria set forth at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

During the detailed evaluation of remedial alternatives, each alternative is assessed against the following nine evaluation criteria: overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. These criteria are explained below.

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

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. **Compliance with ARARs** addresses whether a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. The NCP recognizes that TBCs may be very useful in determining what is protective of a site or how to carry out certain actions or requirements.

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

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

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

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

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

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

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

8. **State acceptance** indicates whether, based on its review of the Proposed Plan and supporting documentation, which comprises the administrative record, the State concurs with, opposes, or has no comments on the proposed remedy.

9. **Community acceptance** refers to the public's general response to the alternatives described in the Proposed Plan and supporting documentation which comprises the administrative record.

Overall Protection of Human Health and the Environment

Alternative R1 would not protect human health and the environment. Alternatives R2 and R3 would provide similar overall protection to human health and the environment. For Alternative R2, human health risk would be eliminated through removal of contaminated soils. Under Alternatives R2 and R3, contaminated land would be restored to beneficial use, and groundwater quality would be protected by treatment or removal of the contaminated soils to meet the RGs. Alternative R3 eliminates human health risk by reducing the mass of contamination in both subsurface soils and groundwater in the source areas. Alternative R1 would not meet the RAOs. Alternatives R2 and R3 would meet the RAOs.

Compliance with ARARs

EPA has identified EPA's Guidance on Remedial Actions for Superfund Sites with PCB Contamination, NYSDEC's soil cleanup objectives for Protection of Groundwater (6 NYCRR Part375-6.8(b), and NYSDEC's CP-51 Soil Cleanup Guidance as ARARs, TBCs or other guidelines to address contaminated soils in Area 3 and Area 4. Alternative R1 would not comply with the ARARs because no action would be taken. Alternatives R2 and R3 would comply with the ARARs through contaminated soil removal and off-Site disposal and contaminant mass removal of COCs via ISTT. Action-specific and location-specific ARARs are not applicable to Alternative R1, since no action would be taken. Alternatives R2 and R3 would comply with action-specific ARARs by implementing health and safety measures during the remedial action and by meeting transportation and disposal requirements for excavated soils. Alternatives R2 and R3 would also comply with location-specific ARARs.

Long-Term Effectiveness and Permanence

Alternative R1 is not considered a permanent remedy since no action would be taken. Alternatives R2 and R3 would achieve long-term effectiveness through the removal of contaminated soils through excavation and off-Site disposal and through contaminated mass removal though ISTT.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative R1 would not reduce toxicity, mobility, or volume through treatment since no treatment would be implemented. Alternative R2 would provide the greatest reduction in the mobility and volume of on-Site contaminated soils through excavation and removal with potential treatment of the excavated soils prior to land disposal. Alternative R3 would provide the greatest reduction of toxicity, mobility and volume through treatment because it utilizes ISTT to treat the VOC-contaminated soils. The treatment of soils disposed of under R2 would only occur only if regulations under the Toxic Substances Control Act (TSCA) require treatment prior to off-Site disposal.

Short-Term Effectiveness

Alternative R1 would not have any short-term impact since no action would be taken. Alternative R2 would have some impact to the surrounding areas during excavation activities. Alternative R2 and R3 would also result in short-term risk to Site workers and the local community during excavation. Alternatives R2 and R3 would generate noise and impact traffic as a result of the use of heavy construction equipment and off-Site transport of contaminated soils. These would need to be mitigated through Site control and traffic control measures. Alternatives R2 and R3 also may temporarily increase particulate emissions. Dust control would need to be implemented through the use of dust suppression techniques (e.g., water or foam sprays) to minimize impact to the workers and the local community. Storm water runoff would need to be controlled through the use of conventional, temporary storm water/erosion control features (*e.g.*, berms, ditches, or silt fences). In addition, during the remedial action, air monitoring would be required both at the perimeter of the 200 Stage Road, within the 200 Stage Road area and within the 200 Stage Road building to reduce risks to workers and the local community from air or vapor emissions during on-Site activities. Potential risks to workers associated with direct contact with contaminated material would be mitigated through the use of personal protective equipment and standard health and safety practices. Alternative R2 would have the biggest impact to the local community since it would involve heavy traffic on local roadways (during Site transportation of contaminated soils and transportation of clean fill to the Site). Truck traffic necessary for the R3 PCB excavation and the thermal treatment equipment also would impact local roadways but to a significantly lesser degree than Alternative R2. Operation of the ISTT under Alternative R3 has the potential to cause an increase in concentrations of VOCs in indoor air; if required, measures would be required to monitor and mitigate this potential short-term impact. Alternatives R2 and R3 may temporarily impact some of the operations conducted at the building at 200 Stage Road.

Implementability

Alternative R1 would be the easiest to implement since it involves no action. Alternative R2 would use conventional construction equipment and is technically implementable. Alternative R3 is technically and administratively implementable although a limited number of vendors will be able to provide the technology. While permits are not required for on-Site activities at Superfund sites, the technical requirements contained within the permits (regarding air emissions, installation of wells, piping, and related remediation system equipment) would be met. The estimated time frame for the construction and implementation of Alternatives R2 and R3 is approximately one year. Alternatives R2 and R3 may also temporarily impact use of the parking lots adjacent to the remediation areas.

Cost

Alternative R1 would not involve any costs. The capital costs associated with Alternative R2 are approximately $39.2 million for the excavation and off-Site disposal of contaminated soils. The capital costs associated with Alternative R3 are $14.5 million if contamination beneath the building is also addressed. There are no O&M costs associated with any of the alternatives.

**Table D. Cost Estimates for the Three Alternatives**

| Alternatives | Capital Cost | Annual O&M Costs | Total Present Worth Cost |
|---|---|---|---|
| RI | $0 | $0 | $0 |
| R2 | $39,223,160 | $0 | $39,223,160 |
| R3 | $14,500,000 | $0 | $14,500,000 |

### 10.8 State/Support Agency Acceptance

NYSDEC concurs with the remedy selected herein.

### 10.9 Community Acceptance

EPA solicited input from the community on the remedial alternatives proposed for the amended remedy for the Site. A summary of any significant comments made, as well as EPA's responses to those comments, are provided in the Responsiveness Summary (**Appendix V**).

## 11. PRINCIPAL THREAT WASTES

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

VOCs are present in Site soils at very high concentrations (TCA and TCE, as high as 23,600 mg/kg and 13,000 mg/kg, respectively), suggesting the presence of DNAPL. These soils constitute principal threat wastes. Alternatives R2 and R3 would address these principal threat wastes, as well as PCB-contaminated soils at the Site. Alternative R3 would provide a greater level of treatment of principal threat wastes than Alternative R2 since it utilizes ISTT to treat the VOC-contaminated soils; whereas, the treatment of soils under Alternative R2 would only occur if concentrations present in the transported soils exceeded regulatory concentrations that require treatment prior to landfilling.

## 12. THE SELECTED REMEDY

### 12.1 Summary of the Rationale for the Selected Remedy

Based upon the requirements of CERCLA, the results of Site investigations, the detailed analysis and evaluation of the alternatives and public comments, EPA has determined that Alternative R3: In situ Thermal Treatment and Excavation and Off-Site Disposal is the selected remedy and best satisfies the requirements of CERCLA Section 121, 42 U.S.C. §9621, and provide the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria at 40 CFR §300.430(e)(9)(iii).

Although both Alternatives R2 and R3 would achieve the RAOs, Alternative R3 will do so at substantially less cost and with a greater level of treatment. The selected remedy Alternative R3 is protective of human health and the environment because it will significantly reduce the principal threat mass of COCs in both surface and subsurface soils through treatment and excavation. Achieving these reductions would substantially reduce contaminants within residual source areas so that downgradient concentrations in groundwater would decrease at a more rapid rate than currently exists. The reduction in contaminant mass through both treatment and excavation would also reduce the risk to human health and the environment and eliminate exposure pathways.

### 12.2 Description of the Selected Remedy

The major components of the selected remedy Alternative R3 include ISTT of approximately 28,000 cubic yards VOC-contaminated soils in Area 3 and Area 4; the excavation and off-Site disposal of approximately 730 cubic yards of PCB-contaminated soils in Area 3 and the implementation of ICs to restrict the use of the 200 Stage Road. As noted above, the conceptual ISTT approach described in Alternative R3 was for the purposes of evaluation, comparison and cost estimating. The description of the ISTT portion of the selected remedy identifies that based upon the RD evaluations, a combination of ISTT technologies could be utilized; therefore, specific components of each of these technologies are not detailed in this description.

ISTT:

- Treatment of VOC-contaminated soils utilizing TCH, SEE, ERH or some combination of these three ISTT technologies based upon the RD evaluation.
- Installation of sheet piling, if determined to be necessary during the RD, prior to any thermal treatment in order to reduce groundwater flow in the more transmissive zones of the subsurface environment.
- Installation of treatment wells beneath the building, if determined necessary during the RD, utilizing appropriate methods that would limit impacts to the building (*e.g.*, via directional drilling).
- Monitoring of temperature and pressure to track subsurface heating, pneumatic, and hydraulic control.

PCB Excavation:

- Pre-design sampling to identify the limits of PCB-contaminated soils excavation.
- Decommissioning of existing monitoring wells (those within and around the excavation footprints).
- Installation (and removal) of sheet piling and associated tie-backs.
- Excavation dewatering.
- On-Site treatment of contaminated groundwater that is collected as part of any necessary dewatering operations and subsequent discharge to a publicly-owned treatment works or permitted outfall.
- Excavation of soils to a depth of approximately 10 feet yielding approximately 730 cubic yards of soils.
- Transport and off-Site disposal of excavated soils in accordance with applicable RCRA and TSCA requirements.
- Backfilling excavations with clean fill, along with appropriate restoration (e.g., asphalt paving, topsoil, seeding).

ICs:

- Reliance on governmental ICs in the form of the commercial/light industrial zoning that is currently in place at 200 Stage Road. Other types of ICs, including proprietary or contractual, also may be utilized.
- Development of an Institutional Control Implementation and Assurance Plan to monitor, maintain and enforce ICs.

In accordance with Section 121(c) of CERCLA, statutory reviews will be conducted no less often than once every five years to ensure that the remedy is, or will be, protective of human health and environment.

The environmental benefits of the selected remedy may be enhanced by consideration, during the RD, of technologies and practices that are sustainable in accordance with the both EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy.

### 12.3 Summary of Estimated Remedy Costs

The cost estimates are based on available information and are order-of-magnitude engineering cost estimates that are expected to be between +50 to -30 percent of the actual project cost. Changes to the cost estimates can occur as a result of new information and data collected during the RD and/or construction of the remedy. The estimated capital, annual O&M and total present-worth costs of the selected remedy are presented below:

| **Alternative R3: In situ Thermal Treatment and Excavation and Off-Site Disposal** | | |
|---|---|---|
| **Capital Cost** | **Annual O&M Cost** | **Present-Worth Cost** |
| **$14,500,000** | **$0** | **$14,500,000** |

A more detailed cost estimate is presented in **Table 15**.

### 12.4 Expected Outcomes of the Selected Remedy

The selected remedy actively addresses soil contamination in Area 3 and Area 4 at 200 Stage Road. The results of EPA's evaluation of the cross media impacts of Site soils to groundwater indicate that the contaminated soils at these locations are an ongoing source of groundwater contamination.

The implementation of selected remedy will result in contaminant levels in soils being reduced below the RGs, identified in **Table B** above, will satisfy the RAOs and will allow the 200 Stage Road to continue to be used for commercial/light industrial purposes. The ISTT of VOC-contaminated soils will eliminate the ongoing source of VOC contamination to groundwater and will facilitate the restoration of the groundwater goals identified in the OU1 ROD. The excavation of PCB-contaminated soils will ensure that there is no direct contact threat from PCBs in soils.

## 13. STATUTORY DETERMINATIONS

Section 121(b)(1) of CERCLA mandates that a remedial action must be protective of human health and the environment, be cost-effective and utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, or contaminants at the Site. Section 121(d) of CERCLA further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to section 121(d)(4) of CERCLA

### 13.1 Protection of Human Health and the Environment

The selected remedy, Alternative R3, protects human health and the environment through the ISTT of VOC-contaminated soils and excavation and the off-Site disposal of PCB-contaminated soils. The selected remedy will ensure continued protectiveness of human health and the environment by further improving the groundwater quality at the Site by addressing the source material, *i.e.*, VOC-contaminated soils, which will eventually result in the restoration of the aquifer. The selected remedy will also protect human health and the environment because it will prevent exposure to PCBs through inhalation, direct contact or ingestion of Site soils.

There are no short-term threats associated with the selected remedy that cannot be readily controlled. In addition, no adverse cross-media impacts are expected from the selected remedy.

### 13.2 Compliance with ARARs

The selected remedy complies with chemical-specific, location-specific and action-specific ARARs. A complete list of the ARARs, TBCs or other guidelines for the selected remedy can be found in **Tables 12-14** in **Appendix II**.

### 13.3 Cost Effectiveness

A cost effective remedy is one in which costs are proportional to the remedy's overall effectiveness (NCP Section 300,430(f)(l)(ii)(D). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (*i.e.*, were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness). Overall effectiveness was then compared to costs to determine cost-effectiveness.

EPA performed a detailed cost analysis for each of the remedial alternatives presented in the FFS. The estimated present worth cost of the selected remedy is $14,500,000, far less than the estimated cost of Alternative R2 at $39,223,160.

Based on the comparison of overall effectiveness to cost, the overall effectiveness of the selected remedy has been determined to be proportional to the costs, and the selected remedy, therefore, represents reasonable value for the money to be expended. In addition, the selected remedy meets the statutory requirement that Superfund remedies be cost effective in that it is the least-cost action alternative.

### 13.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to Maximum Extent Practicable

The selected remedy complies with the statutory mandate to utilize permanent solutions, alternative treatment technologies and resource recovery technologies to the maximum extent practicable. The selected remedy permanently treats the source materials constituting principal threats at the Site through the use of ISTT and removes threats posed by PCB-contaminated soils through excavation and off-Site disposal with treatment, if necessary.

### 13.5 Preference for Treatment as a Principal Element

The selected remedy complies with the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element. The selected remedy treats the VOC-contaminated source materials, constituting principal threat wastes at the Site through the use of ISTT.

### 13.6 Five-Year Review Requirements

The selected remedy will result in some PCB contamination remaining at the Site that will not allow for unrestricted use and unlimited exposure. Pursuant to Section 121(c) of CERCLA, a statutory review will be conducted no less often than once every five years to ensure that the remedy is, or will be, protective of human health and environment. If justified by the five-year review, additional response actions may be implemented to remove, to treat or to contain the contaminated soils. In addition, the Site is being reviewed at least once every five years, because VOCs in groundwater have not yet achieved MCLs. Four five-year reviews have been conducted for the Site to date. The next five-year review report for the Site is scheduled for 2018.

## 14. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan identified Alternative R3: In Situ Thermal Treatment and Excavation and Off-Site Disposal as the preferred alternative to eliminate the migration of contaminants in soils to the groundwater along with the common elements of ICs and five-year reviews.

EPA reviewed all oral comments (no written comments were submitted) submitted during the public comment period and has determined that no significant changes to the remedy, as originally identified in the Proposed Plan, are necessary based on public comment.

EPA, however, has determined that the IC component of the preferred alternative should be modified. The Proposed Plan stated that "A governmental IC in the form of the commercial/light industrial zoning that is currently in place would be relied upon as an IC until the referred remedial alternative is fully implemented and allows for unrestricted use/unlimited exposure." The selected remedy at the Site is ultimately expected to allow for unrestricted use/unlimited exposure with respect to VOCs, and the use of the governmental IC is appropriate as an IC in the interim. However, while the RGs for PCBs allow for commercial/industrial use, they will not result in unrestricted use and unlimited exposure. Therefore, a permanent rather than interim IC is appropriate to restrict uses of 200 Stage Road to commercial/industrial. This ROD Amendment relies on the existing governmental ICs (*i.e.*, commercial/light industrial zoning), but other types of ICs, such as proprietary or contractual, also may be utilized. In addition, the five-year reviews that will continue for the Site have been identified as statutory (rather than policy) reviews.

# APPENDIX I

## FIGURES


Map created using orthoimagery data from NY state website, sample result data in 2010.

Map Creation Date: 11 April 2016

Coordinate system: New York State Plane (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

300 0 300
Feet

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\arcinfoprojects\SERAS01\SERA00064_Vestal_Chlorinated\FS_Report_2016\064_FS2016_f1_SIteLocation_SurroundingAreas_f1.mxd

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# SERAS-064

**Figure 1**
Site Location Map
Vestal Water Supply Well 1-1
Vestal, New York


Map created using orthoimagery data from NY state website, sample result data in 2010.

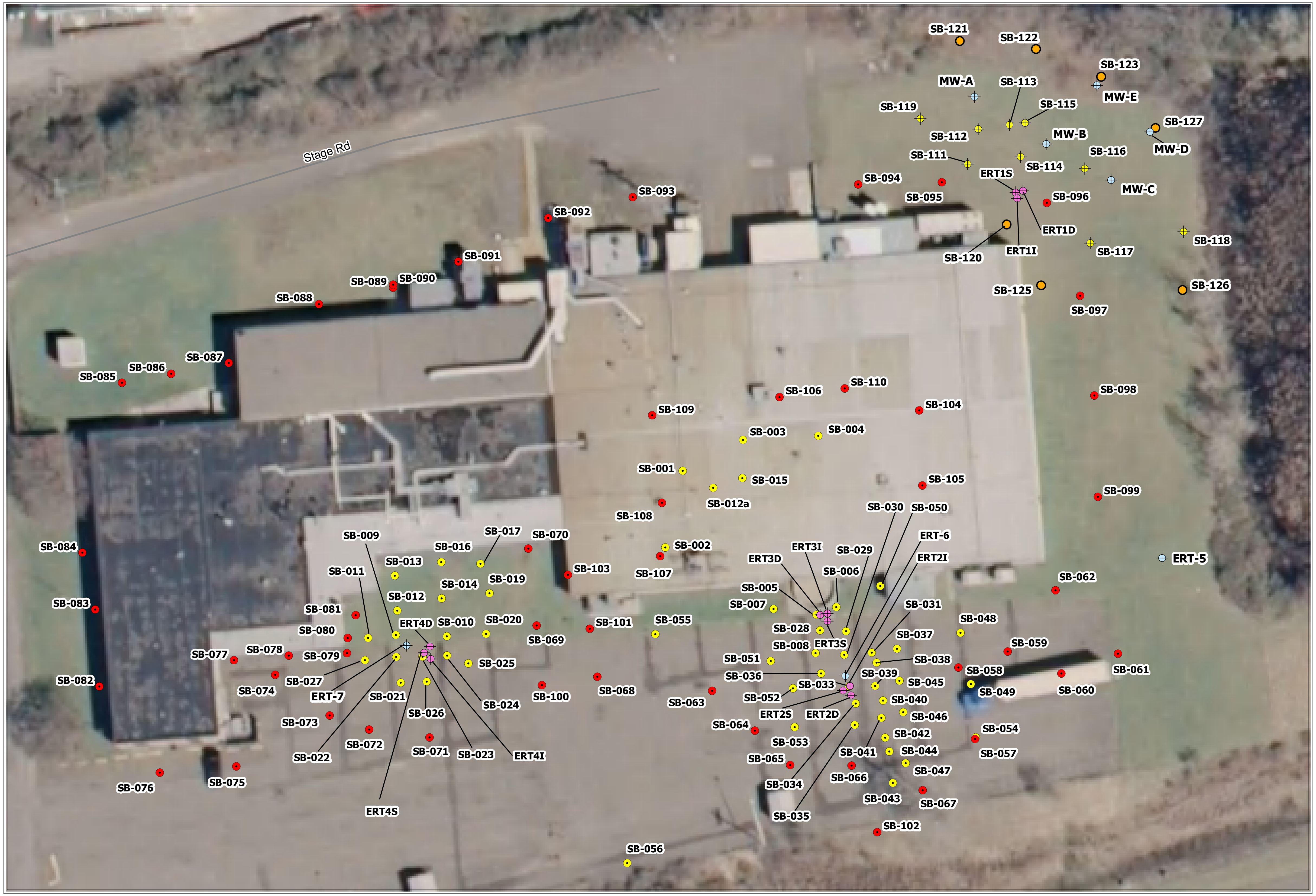
Map Creation Date: 11 April 2016

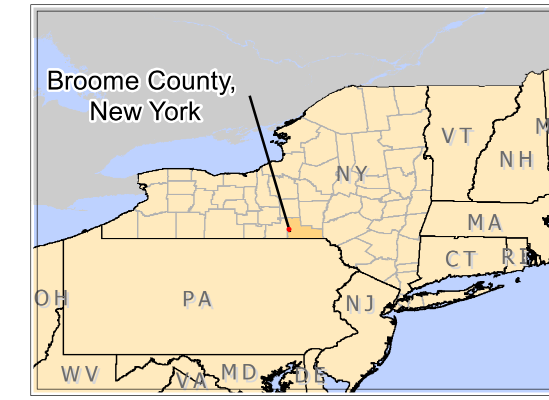
Coordinate system: New York State Plane (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

300 0 300
Feet

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\arcinfoprojects\SERAS01\SERA00064_Vestal_Chlorinated\FS_Report_2016\064_FS2016_f1_SIteLocation_SurroundingAreas_f1.mxd

| U.S EPA Environmental Response Team<br>Scientific Engineering Response and Analytical Services<br>EP-W-09-031<br>W.A.# SERAS-064 | **Figure 2**<br>Stage Road Industrial Park Investigation<br>Vestal Water Supply Well 1-1<br>Vestal, New York |
|---|---|





N
W
E
S
Magnetic North

## Legend

- ERT Monitor Well (June 2009)
- Soil Boring (March 2009)
- ERT Monitor Well (June 2008)
- Soil Boring (July 2008)
- Soil Boring (November/December 2007)
- Soil Boring (August/September 2006)

Map created using orthoimagery data from NY state website, sampling data in 2010.

Map Creation Date: 15 December 2010

Coordinate system: New York State Plan (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

50 0 50
Feet

**Note:**
Boring SB-32 is at location of Monitor Well ERT-6

| U.S EPA Environmental Response Team<br>Scientific Engineering Response and Analytical Services<br>EP-W-09-031<br>W.A.# 0-064 | **Figure 3**<br><u>Borehole and Monitor Well Locations</u><br>Vestal Water Supply Well 1-1<br>Vestal, New York |
|---|---|

Data: g:\arcviewprojects\SERAS01\00-064
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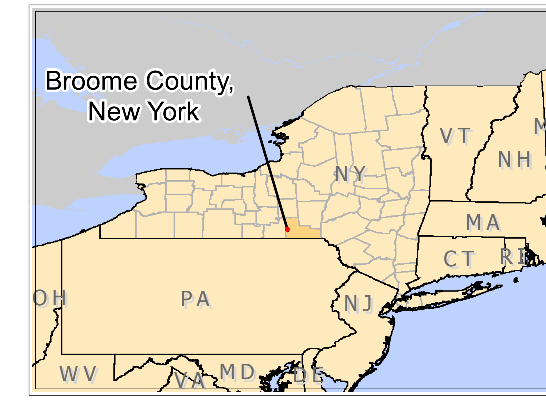
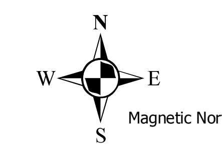







**Legend**

● Borehole Location

*(December 2012 Field Investigation)*

Map created using orthoimagery data from NY state website, sampling data in 2010.

Map Creation Date: 24 February 2015

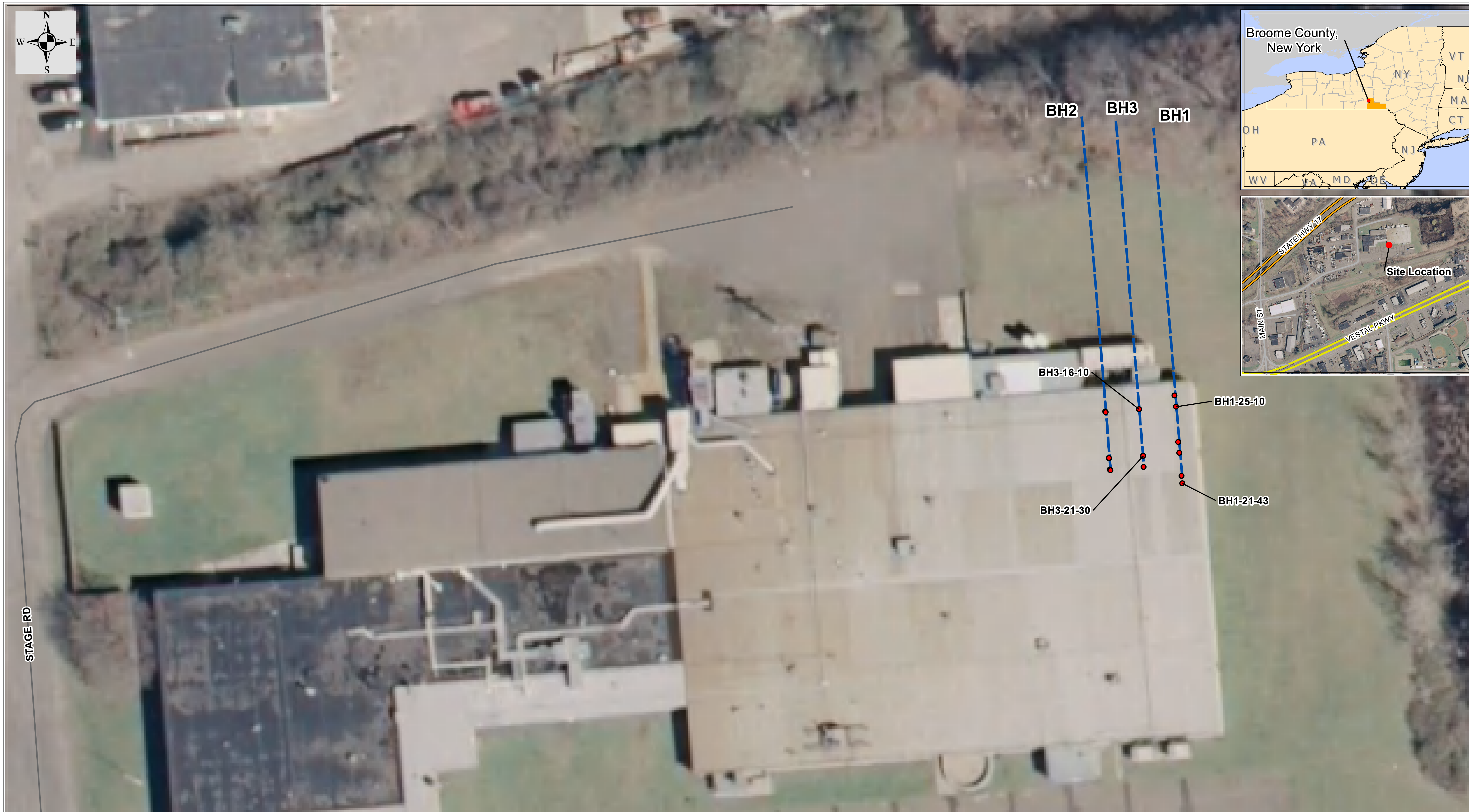
Coordinate system: New York State Plan (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

50 0 50
Feet

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\ArcInfoProjects\SERAS01\SER00064_Vestal Chlorinated\CSM_Report_2015\064_f4_CSM2015_Borehole_Sample Locations_Site_Human_Health_Risk_Assessment_f4

U.S EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-064

**Figure 4**
Borehole Sample Locations
Vestal Water Supply Well 1-1
Vestal, New York




Map created using orthoimagery data from NY state website.

Map Creation Date: 24 February 2015

Coordinate system: New York State Plan (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

40 0 40 Feet

**Legend**

- Borehole Sample Location (July 2013)
- Borehole Lines (3 Depths per Line)

| U.S EPA Environmental Response Team<br>Scientific Engineering Response and Analytical Services<br>EP-W-09-031<br>W.A.# 0-064 | **Figure 5**<br>Directional Borehole Locations<br>Vestal Water Supply Well 1-1<br>Vestal, New York |
|---|---|

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\ArcInfoProjects\SERAS01\SER00064_Vestal Chlorinated\CSM_Repoert_2015/064_f5_CSM2015_Directional Borehole_Locations_f5


Map created using orthoimagery data from NY state website, sample result data in 2012.

Map Creation Date: 30 March 2016

Coordinate system: New York State Plan (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

60 0 60
Feet

The above areas represent the extent of all contaminants of concern (COCs) that are discussed in the FS narrative.

Note:
sq.ft. = square feet

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# SERAS-064

**Figure 6**
Extent of Remediation for Area 3 and Area 4

Vestal Water Supply Well 1-1
Vestal, New York

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\ArcInfoProjects\SERAS01\SER00064_Vestal Chlorinated\FS_Report_2016\064_FS2016_f9_Maxl_Extents_ofContamination_ExceedingSecondaryRemediationGoals_f9V2.mxd

# APPENDIX II

## TABLES

## TABLE 1

West Area of Parking Lot (Area 4-1)
Contaminants of Concern Detected Above Soil Cleanup Goals
Vestal Warer Supply Well 1-1
Vestal, New York

| Boring No. | Depth (feet) | 1,1,1-TCA | TCE | cis-1,2-DCE |
|---|---|---|---|---|
| | | Soil Cleanup Goal (680 ug/kg) | Soil Cleanup Goal (470 ug/kg) | Soil Cleanup Goal (250 ug/kg) |
| SB-009 | 12.5 | **136,000** | **86,200** | U |
| SB-009 | 14 | **867,000** | **266,000** | U |
| SB-009 | 17 | **19,000,000** | **6,830,000** | U |
| SB-009 | 18 | 76.5 | **580,000** | 53.7 |
| SB-009 | 24.5 | **952** | 198 | U |
| SB-009 | 28.5 | 345 | 75 | U |
| SB-010 | 18.5 | **3,910** | 108 | 11.0 J |
| SB-010 | 22 | **3,410** | 38 | U |
| SB-011 | 12.5 | 132 | 155 | U |
| SB-011 | 19 | **2,000** | **1,040** | U |
| SB-012 | 9 | 318 | **1,070** | U |
| SB-012 | 17 | **63,400** | **28,900** | U |
| SB-012 | 18 | 281 | **1,520** | U |
| SB-012 | 20 | 287 | 358 | 15.6 J |
| SB-013 | 9 | 66.5 J | 161 J | U |
| SB-014 | 17.5 | **6,620** | **2,360** | U |
| SB-016 | 18 | 121 | 163 | U |
| SB-017 | 20 | 317 | 129 | U |
| SB-019 | 17.5 | 294 | 82 | U |
| SB-020 | 18.5 | **70,300** | **15,500** | U |
| SB-021 | 13 | **1,170** | **1,700 J** | U |
| SB-021 | 15 (A) | **804** | **971** | U |
| SB-021 | 15 | **2,890 J** | **4,950 J** | U |
| SB-022 | 11.5 | **55,500 J** | **20, 500** | U |
| SB-022 | 13.5 | **200,000** | **107,000** | **1,050** |
| SB-022 | 15 | **9,550,000** | **1,500,000** | U |
| SB-022 | 16 | **12,100** | **5,040** | U |
| SB-022 | 20 | **12,800** | **2,400** | U |
| SB-023 | 11.5 | **35,700** | **115,000** | U |
| SB-023 | 12.5 | **579,000** | **539,000** | U |

**TABLE 1** (cont'd)

West Area of Parking Lot (Area 4-1)
Contaminants of Concern Detected Above Soil Cleanup Goals
Vestal Water Supply Well 1-1
Vestal, New York

| Boring No. | Depth (feet) | 1,1,1-TCA | TCE | cis-1,2-DCE |
|---|---|---|---|---|
| | | Soil Cleanup Goal (680 ug/kg) | Soil Cleanup Goal (470 ug/kg) | Soil Cleanup Goal (250 ug/kg) |
| SB-023 | 15 | **2,780,000** | **783,000** | U |
| SB-023 | 16 | **23,600,000** | **13,000,000** | U |
| SB-023 | 20 | **12,800** | **2,540** | U |
| SB-026 | 15 | **739** | **851** | U |
| SB-069 | 19 | **15,476 E** | 71.5 | 23.9 |
| SB-079 | 14 | 295 E | 53.1 | U |
| SB-080 | 1.7 | 41.9 | 410 E | U |
| SB-081 | 13 | 105 | 372 E | U |
| SB-081 | 18 | 44 | 201 | U |
| SB-100 | 20 | 304 E | 11.9 | U |

Results are reported as dry weight
Contaminant concentrations in micrograms per kilogram (ug/kg)
**Bold** - concentration above soil cleanup goal
U - not detected (below analytical reporting limit)
J - approximate concentration (compound detected below analytical reporting limit)
E - estimated concentration (exceeds response of highest standard in the initial calibration range)

TCA - trichloroethane
TCE - trichloroethene
DCE - dichloroethene

## TABLE 2

East Area of Parking Lot (Area 4-2)
Contaminants of Concern Detected Above Soil Cleanup Goals
Vestal Water Supply Well 1-1
Vestal, New York

| Boring No. | Depth (feet) | 1,1,1-TCA | TCE | cis-1,2-DCE |
|---|---|---|---|---|
| | | Soil Cleanup Goal (680 ug/kg) | Soil Cleanup Goal (470 ug/kg) | Soil Cleanup Goal (250 ug/kg) |
| SB-001 | 5 | 403 | **627** | **526** |
| SB-001 | 12 | 78.3 | 234 | **767** |
| SB-001 | 15 | **2,620** | **12,900 J** | **1,040** |
| SB-001 | 17.5 | **5,190** | **4,230** | **719 J** |
| SB-001 | 20 | **793** | **2,540** | 71.4 |
| SB-001 | 22.5 | **2,550** | **8,110** | 177 |
| SB-001 | 24 | **4,040** | **36,000** | **300** |
| SB-001 | 25 | **768 J** | **2,190** | **629 J** |
| SB-001 | 27.5 | **776** | **1,790** | **258** |
| SB-001 | 30 | 93.9 | 165 | 10.2 |
| SB-002 | 10 (dup) | 147 | 144 | 143 |
| SB-002 | 15 | 94.4 | 153 | **537 J** |
| SB-002 | 20 | 53.1 | 273 | **438** |
| SB-004 | 5 | 376 | **1,010** | **305** |
| SB-005 | 20 | **580,000 J** | **1,040 J** | U |
| SB-005 | 23 | 179 | 70 | U |
| SB-006 | 4.5 | 545 | 279 | U |
| SB-007 | 4.5 | 527 | 287 | U |
| SB-007 | 20 | **885** | 125 J | U |
| SB-008 | 5 | 579 | 406 | 19.9 J |
| SB-008 | 7.5 | **719** | 312 | U |
| SB-008 | 15 | **3,660** | U | U |
| SB-008 | 20 | **93,200** | **3,360** | U |
| SB-008 | 25 | **593 J** | 80.1 J | U |
| SB-012a | 6 | **1,030** | **1,720** | **924** |
| SB-012a | 16 | **83,600** | **108,000** | **1,370 J** |
| SB-012a | 23 | **10,400 J** | **5,610 J** | 53.2 |
| SB-015 | 20 | 347 | 134 | U |
| SB-028 | 16.5 | **4,730,000** | **12,600** | U |
| SB-028 | 17.5 | **811,000** | **4,760 J** | U |

## **TABLE 2** (cont'd)

East Area of Parking Lot (Area 4-2)
Contaminants of Concern Detected Above Soil Cleanup Goals
Vestal Warer Supply Well 1-1
Vestal, New York

| Boring No. | Depth (feet) | 1,1,1-TCA | TCE | cis-1,2-DCE |
|---|---|---|---|---|
| | | Soil Cleanup Goal (680 ug/kg) | Soil Cleanup Goal (470 ug/kg) | Soil Cleanup Goal (250 ug/kg) |
| SB-028 | 20 | **52,800** | **1,630 J** | U |
| SB-029 | 16 | **15,300** | U | U |
| SB-029 | 17.5 | **7,550** | U | U |
| SB-029 | 19 | **340,000 J** | U | U |
| SB-029 | 20 | **29,700** | U | U |
| SB-030 | 15 | **133,000 J** | U | U |
| SB-030 | 16 | **21,800,000** | **12,100** | U |
| SB-030 | 17.5 | **69,500** | U | U |
| SB-030 | 20 | **4,920** | 177 J | U |
| SB-031 | 19.5 | **24,100** | U | U |
| SB-032 | 15 | **3,430** | 461 | U |
| SB-032 | 16.5 | **689,000** | U | U |
| SB-032 | 19 | **13,300** | **699** | U |
| SB-033 | 12.5 | **3,090** | **669** | U |
| SB-033 | 18.5 | **121,000 J** | U | U |
| SB-033 | 19.5 | **13,100** | 454 J | U |
| SB-034 | 18.5 | **1,940** | **538 J** | U |
| SB-035 | 7.5 | 305 | U | U |
| SB-035 | 19.5 | **9,190** | **561 J** | U |
| SB-036 | 19.5 | **10,700** | 271 J | U |
| SB-037 | 20 | **58,000** | U | U |
| SB-038 | 15 | **156,000** | **854 J** | U |
| SB-038 | 18 | **278,000** | U | U |
| SB-038 | 20 | **51,600** | U | U |
| SB-039 | 17.5 | **884,000** | U | U |
| SB-039 | 19.5 | **86,500** | U | U |
| SB-039 | 20 | **18,300** | U | U |
| SB-040 | 18 | **328,000** | U | U |
| SB-040 | 20 | **16,700** | 233 J | U |
| SB-041 | 16.5 | **2,650,000** | U | U |

## TABLE 2 (cont'd)

East Area of Parking Lot (Area 4-2)
Contaminants of Concern Detected Above Soil Cleanup Goals
Vestal Warer Supply Well 1-1
Vestal, New York

| Boring No. | Depth (feet) | 1,1,1-TCA | TCE | cis-1,2-DCE |
|---|---|---|---|---|
| | | Soil Cleanup Goal (680 ug/kg) | Soil Cleanup Goal (470 ug/kg) | Soil Cleanup Goal (250 ug/kg) |
| SB-041 | 19 | **38,500** | U | U |
| SB-042 | 17.5 | **285,000** | U | U |
| SB-042 | 19.5 | **58,200** | **2,110** | U |
| SB-043 | 20.5 | **1,650 J** | 55.3 J | U |
| SB-044 | 15.5 | **37,600** | **487 J** | U |
| SB-044 | 18 | **3,200,000** | U | U |
| SB-044 | 20 | **4,350,000** | U | U |
| SB-045 | 17.5 | **1,090,000** | U | U |
| SB-046 | 16 | **5,360** | 209 J | U |
| SB-046 | 18.5 | **296,000** | U | U |
| SB-046 | 20 | **95,300** | **3,590** | U |
| SB-049 | 21 | | **867** | U |
| SB-051 | 19.5 | **39,400** | **1,380 J** | U |
| SB-052 | 19.5 | **1,340** | 28.1 J | U |
| SB-056 | 19.5 | 250 J | 122 | U |
| SB-066 | 19.5 | **28,700 E** | 317 E | 3.4 J |
| SB-102 | 14 | U | 170 | 5.54 J |
| SB-107 | 2 | U | 234 E | 56.3 |
| SB-108 | 20 | U | 311 E | **7,880 E** |

Results are reported as dry weight
Contaminant concentrations in micrograms per kilogram (ug/kg)
**Bold** - concentration above soil cleanup goal
U - not detected (below analytical reporting limit)
J - approximate concentration (compound detected below analytical reporting limit)
E - estimated concentration (exceeds response of highest standard in the initial calibration range)

TCA - trichloroethane
TCE - trichloroethene
DCE - dichloroethene

# TABLE 3

Northeast Side of Building
Contaminants of Concern Detected Above Soil Cleanup Goals
Vestal Water Supply Well 1-1
Vestal, New York

| Boring No. | Depth (feet) | 1,1,1-TCA | TCE | cis-1,2-DCE | 1,2,4-TMB | 1,3,5-TMB |
|---|---|---|---|---|---|---|
| | | Soil Cleanup Goal (680 ug.kg) | Soil Cleanup Goal (470 ug/kg) | Soil Cleanup Goal (250 ug/kg) | Soil Cleanup Goal (3600 ug/kg) | Soil Cleanup Goal (8400 ug/kg) |
| SB-095 | 18 | **832 E** | **18,100 E** | **3,610 E** | na | na |
| SB-096 | 14 | **15,900 E** | **1,170 E** | **17,800 E** | na | na |
| SB-111 | 14 | U | U | U | **72,200** | **26,800** |
| SB-111 | 17 | **7,160** | **244,000** | **19,800** | **34,400** | **13,300** |
| SB-111 | 19.5 | U | **23,000** | **15,800** | 2,230 J | 897 J |
| SB-112 | 14.5 | U | **380 J** | U | U | U |
| SB-112 | 19.5 | U | **1,560** | U | U | U |
| SB-114 | 13 | U | U | **863 J** | **97,300** | **37,400** |
| SB-114 | 15 | U | U | U | **7,250** | 2,690 |
| SB-114 | 17.5 | U | U | **4,110** | 1,500 | 584 J |
| SB-114 | 20 | U | U | **4,190** | U | U |
| SB-115 | 6.9 | U | U | U | **95,200** | **45,900** |
| SB-115 | 12.5 | U | U | U | **60,000** | **28,300** |
| SB-115 | 17 | U | U | **316 J** | 228 J | U |
| SB-115 | 20 | U | U | **889** | U | U |
| SB-116 | 9.5 | U | U | U | **107,000** | **45,600** |
| SB-116 | 11.5 | U | U | U | **6,270** | 2,220 J |
| SB-116 | 20 | U | U | **306 J** | 406 J | 207 J |
| SB-118 | 20 | U | **673** | U | U | U |
| SB-119 | 20 | U | **1,720** | U | U | U |
| SB-120 | 15 | U | U | U | **73,000** | **23,600** |
| SB-120 | 24 | U | 150 | 7.37 | U | U |
| SB-121 | 19 | U | **488** | 6.62 | U | U |
| SB-122 | 20 | U | U | **519** | U | U |
| SB-123 | 20 | U | 2.25 J | **1,710** | U | U |
| SB-123 | 24 | U | U | **1,690** | U | U |
| SB-127 | 6.5 | U | U | U | **40,000** | **21,300** |
| SB-127 | 10 | U | U | U | **3,960** | 2,170 |
| BH1-21-43 | 21 | U | 198 | U | U | U |
| BH1-25-10 | 25 | U | **827** | U | U | U |
| BH3-16-10 | 16 | U | 216 | **352** | U | U |
| BH3-21-30 | 21 | U | 369 | **380** | U | U |

Results are reported as dry weight
Contaminant concentrations in micrograms per kilogram (ug/kg)
**Bold** - concentration above soil cleanup goal
U - not detected (below analytical reporting limit)
J - approximate concentration (compound detected below analytical reporting limit)
E - estimated concentration (exceeds response of highest standard in the initial calibration range)
na - not analyzed

TCA - trichloroethane
TCE - trichloroethene
DCE - dichloroethene
TMB - trimethylbenzene

**Table 4**

**PCBs in Soil Samples in Area 3**

**Vestal Water Supply Well 1-1 Site**
**Vestal, New York**

| Borehole # | Depth (ft-bgs) | Sampling Event | Analyte | Results (mg/kg) |
|---|---|---|---|---|
| MW-1 | 10-20 (composite) | May 2010 | Aroclor 1254 | 0.304 |
| | | | Aroclor 1260 | 10.9 |
| | | | Total Aroclors | 11.2 |
| sB-004 | 12.5 – 13.5 | December 2012 | Aroclor 1254 | 0.340 |
| sB-004 | 17 - 18 | December 2012 | Aroclor 1254 | 0.200 |
| | | | Aroclor 1260 | 0.120 |
| | | | Total Aroclors | 0.320 |
| sB-005 | 17 - 18 | December 2012 | Aroclor 1254 | 0.130 |
| sB-014 | 0 - 1 | December 2012 | Aroclor 1254 | 0.120 |
| | | | Aroclor 1260 | 0.079 |
| | | | Total Aroclors | 0.199 |
| sB-030 | 5 - 6 | December 2012 | Aroclor 1254 | 0.360 |
| | | | Aroclor 1260 | 31.0 |
| | | | Total Aroclors | 31.4 |
| sB-030 | 10 - 11 | December 2012 | Aroclor 1260 | 0.240 |
| sB-034 | 16.5 – 17.5 | December 2012 | Aroclor 1260 | 0.230 |
| BH3-10-30 | 10 | July 2013 | Aroclor 1260 | 0.130 |

# APPENDIX II - TABLE 5
## SUMMARY OF CHEMICALS OF CONCERN AND MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATIONS

## Area 4 - Vestal Water Supply Well 1-1 Operable Unit 2
## Town of Vestal, Broome County, New York

Scenario Timeframe: Current/Future
Medium: Subsurface Soil (0 to 10 Feet)
Exposure Medium: Subsurface Soil (0 to 10 Feet)

| | | Concentration Detected | | | | Exposure Point Concentration | | | |
|---|---|---|---|---|---|---|---|---|---|
| Exposure Point (1) | Chemicals of Concern (1) | Minimum (Qualifier) | Maximum Concentration (Qualifier) | Concentration Units (2) | Frequency of Detection | Value | Units (2) | Statistic (3) | Rationale (2, 4) |
| Subsurface soil (0 to 10 Feet) | Total Aroclor | 0.0086 J | 31.36 | mg/kg | 8/68 | 28.410 | mg/kg | 97.5% KM (Chebyshev) UCL | ProUCL UCL - NP |

(1) Total Aroclor concentrations were calculated by summing across individual detected aroclors in each sample. EPC is based on the 95UCL for those samples with detected Aroclor concentrations only. Aroclors 1016, 1254 and 1260 were the only Aroclors detected in surface plus subsurface soil.

(2) Units in milligrams/kilogram (mg/kg). UCL = Upper Confidence Limit, UCL-NP = Nonparametric UCL.

(3) Statistical method recommended by ProUCL for calculation of 95% UCL statistic.

(4) ProUCL, a statistical software package developed by EPA, was used to calculate the UCLs. ProUCL version 5.0 was used to calculate the Exposure Point Concentration. Pro-UCL recommended the H-UCL statistic for the lognormal distribution of these data. The lesser of the 95% UCL or the maximum detected concentration is used as the Exposure Point Concentration value.

## APPENDIX II - TABLE 6
## SELECTION OF EXPOSURE PATHWAYS

## Area 4 - Vestal Waster Supply Well 1-1 Operable Unit 2
## Town of Vestal, Broome County, New York

| Scenario Timeframe | Media | Exposure Medium | Exposure Point | Receptor Population | Receptor Age | Exposure Route | Type of Analysis | Rationale for Selection or Exclusion of Exposure Pathway |
|---|---|---|---|---|---|---|---|---|
| Current / Future | Soils | Soils Collected up to Depth of 10 Feet | Vestal 1,1 - Area 4 | Construction Worker | Adult | Ingestion | Quantitative | Incidental ingestion of and dermal contact with contaminated soil during work activities is possible. Therefore, this pathway will be evaluated quantitatively. |
| | | | | | | Dermal | Quantitative | |
| | | | | | | Inhalation | Quantitative | VOCs are a COPC at this site; off-gassing from exposed soil is possible. Therefore, this pathway will be evaluated quantitatively. |
| Future | | | | Resident | Adult / Child | Ingestion | Quantitative | Although there are no current residents at the Site, potential future residential development is possible without a deed restriction limiting future land use. Therefore, incidental ingestion of and dermal contact with contaminated soil by future resident was evaluated quantitatively. |
| | | | | | | Dermal | Quantitative | |
| | | | | | | Inhalation | Quantitative | VOCs are a COPC at this site; off-gassing from exposed soil is possible. Therefore, this pathway will be evaluated quantitatively. |
| Current / Future | | | | Outdoor Worker | Adult | Ingestion | Quantitative | Incidental ingestion of and dermal contact with contaminated soil during work. Dermal activities is possible. Therefore, this pathway was evaluated quantitatively |
| | | | | | | Dermal | Quantitative | |
| | | | | | | Inhalation | Quantitative | VOCs are a COPC at this site; off-gassing from exposed soil is possible. Therefore, this pathway will be evaluated quantitatively. |
| Current / Future | | | | Trespasser | Adolescent (7 to 18 Years) | Ingestion | Quantitative | Incidental ingestion of and dermal contact with contaminated soil while trespassing. Dermal activities is possible. Therefore, this pathway was evaluated quantitatively |
| | | | | | | Dermal | Quantitative | |
| | | | | | | Inhalation | Quantitative | VOCs are a COPC at this site; off-gassing from exposed soil is possible. Therefore, this pathway will be evaluated quantitatively. |
| Current / Future | | | | Indoor Worker | Adult | Inhalation | Separate Analysis | The potential for vapor intrusion from soil gas into indoor air in the building is being addressed using the Regional Matrix for Vapor Intrusion separately. |

# APPENDIX II - TABLE 7
## NON-CANCER TOXICITY DATA SUMMARY FOR CHEMICALS OF CONCERN

## Area 4 - Vestal Water Suplpy Well 1-1 Operable Unit 2
## Town of Vestal, Broome County, New York

| Pathway: Ingestion/Dermal | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Oral Reference Doses | | Dermal (1) | | Absorbed RfD for Dermal (1) | | | Combined | RfD Target Organs | |
| Chemicals of Concern | Chronic / Subchronic | Value | Units (3) | Value | Reference | Value | Units (1) | Primary Target Organ | Uncertainty/Modifying Factor | Sources (2) | Date |
| Aroclor 1016 | Chronic | 7E-05 | mg/kg-day | NA | EPA 2004 | NA | EPA 2004 | **Developmental** | 100 | IRIS | **9/2015** |
| Aroclor 1254 | Chronic | 2E-05 | mg/kg-day | NA | EPA 2004 | NA | EPA 2004 | **Immune System, Eye** | 300 | IRIS | **9/2015** |

(1) Oral absorption data is not provided since dermal exposures were not evaluated in this assessment and will be addressed during the 17 Mile Study.
(2) Abbreviations: IRIS - Integrated Risk Information System; NA - not appropriate; mg/kg-day - milligrams/kilogram bodyweight/day).

(3) The source of the oral absorption efficiency to dermal factor is from RAGS Part E Table 4-1 (EPA 2004).

# APPENDIX II - TABLE 8
## NON-CANCER REFERENCE CONCENTRATIONS FOR CHEMICALS OF CONCERN

### Area 4 - Vestal Water Supply Well 1-1 Operable Unit 2
### Town of Vestal, Broome County, New York

| Pathway: Inhalation | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Inhalation Reference Concentration | | | | RfC Target Organs | |
| Chemicals of Concern | Chronic / Subchronic | Value | Units (1) | Primary Target Organ | Combined Uncertainty/Modifying Factor | Sources (2) | Date |
| Aroclor 1016 | Chronic | 5E-06 | mg/m$^3$ | **Immune System** | Route to route extrapolation as discussed below (3) | IRIS | **09/01/15** |
| Aroclor 1254 | Chronic | 5E-06 | mg/m$^3$ | **Immune System** | Route to route extrapolation as discussed below (3) | IRIS | **09/01/15** |

(1) Reference Concentrations are presented in units of milligrams/cubic meter (ug/m$^3$).

(2) Abbreviations: IRIS - Integrated Risk Information System; NA - not appropriate.

(3) No RfC value is provided in the RSL table for PCBs. A route to route extrapolation was used to establish a non-cancer RfC for PCBs consistent with the HEAST guidance. The extrapolated RfC was calculated as: Extrapolated RfC (milligrams per cubic meter [mg/m3]) = RfD(oral) (mg/kg-day) * 1/Inhalation Rate (cubic meters per day [m3/day]) * BW (kilogram; kg).

# APPENDIX II - TABLE 9
## CANCER TOXICITY DATA SUMMARY - ORAL/DERMAL CANCER SLOPE FACTORS AND WEIGHT OF EVIDENCE FOR CHEMICALS OF CONCERN

## Area 4 - Vestal Water Supply Well 1-1 Operable Unit 2
## Town of Vestal, Broome County, New York

| Chemicals of Concern | Oral Cancer Slope Factor | | Oral Absorption Efficiency for Dermal (1) | Absorbed Cancer Slope Factor (1) for Dermal | | Weight of Evidence/ Cancer Guideline Description (2) | Oral Cancer Slope Factor | |
|---|---|---|---|---|---|---|---|---|
| | Value | Units (3) | | Value | Units (4) | | Source(s) (3) | Date(s) |
| Total PCBs (high risk) | 2E+00 | $(mg/kg\text{-}day)^{-1}$ | NA | NA | | **Probable Human Carcinogen (B2)** | IRIS | 2015 |
| Total PCBs (low risk) | 1E+00 | $(mg/kg\text{-}day)^{-1}$ | NA | NA | | **Probable Human Carcinogen (B2)** | IRIS | 2015 |

(1) Oral absorption factors were evaluated based on RAGS Part E.

(2) Cancer Weight of Evidence Classifications are based on EPA's Cancer Guidelines 1986.

(3) Abbreviations: NA = not available; mg/kg-day = milligrams/kilogram bodyweight/day; IRIS - Integrated Risk Information System;

# APPENDIX II - TABLE 10

## CANCER TOXICITY DATA SUMMARY - INHALATION UNIT RISK FACTORS AND WEIGHT OF EVIDENCE FOR CHEMICALS OF CONCERN

### Area 4 - Vestal Water Supply Well 1-1 Operable Unit 2
### Town of Vestal, Broome County, New York

| Chemicals of Concern | inhalation Unit Risk Factors | | Weight of Evidence/ Cancer Guideline Description (3) | Source of Inhalation Unit Risk Factor | |
|---|---|---|---|---|---|
| | Value | Units (4) | | Source(s) (4) | Date(s) |
| Total PCBs (high risk) | 5.7E-04 | µg/m$^3$ | **Probable Human Carcinogen (B2)** | IRIS | 2015 |

(1) Cancer Weight of Evidence Classifications are based on EPA's Cancer Guidelines 1986.
(2) Abbreviations: NA = not available; ug$^3$ = micrograms/cubic meter; IRIS - Integrated Risk Information System;

# APPENDIX II - Table 11
## CALCULATED CANCER RISKS AND NON-CANCER HAZARDS TO RME INDIVIDUAL

## Area 4 - Vestal Water Supply Well 1-1 Operable Unit 2
## Town of Vestal, Broome County, New York

Scenario Timeframe: Current / Future
Receptor Population: Construction Worker
Receptor Age: Adult

| Medium | Exposure Medium | Exposure Point | Chemicals of Concern | Carcinogenic Risk | | | | | Non-Carcinogenic Hazard Quotient | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Ingestion | Inhalation | Dermal | External (Radiation) | Exposure Routes Total | Primary Target Organ(s) | Ingestion | Inhalation | Primary Target Organ(s) Inhalation | Dermal | Exposure Routes Total |
| Subsurface soil (0 to 10 Feet) | Subsurface soil (0 to 10 Feet) | Vestal 1,1 | Total PCBs | 2.0E-06 | 6.00E-08 | 2.00E-05 | | 2.2E-05 | | | | | | |
| | | | Aroclor 1016 | | | | | | Developmental | 0.01 | 0.03 | Immune | 0.01 | 0.05 |
| | | | Aroclor 1254 | | | | | | immune system/inflammation of the Meibomian gland/distorted growth of fingernails and toenails | 0.01 | 0.00 | Immune | 0.01 | 0.02 |
| | | | Aroclor 1260 | | | | | | immune system/inflammation of the Meibomian gland/distorted growth of fingernails and toenails | 0.50 | 0.10 | Immune | 1.00 | 1.6 |
| | | | Total | 2.0E-06 | 6.0E-08 | 2.0E-05 | | 2.2E-05 | | 0.5 | 0.1 | | 1.0 | 1.7 |
| | | | | | | | | | | Total HI - Immune System | | | | 2 |
| | | | | | | | | | | Total HI - Developmental | | | | 0.05 |

## TABLE 12

# Chemical-Specific Applicable or Relevant and Appropriate Requirements (ARARs); Advisories, Criteria and Guidance to be Considered (TBCs); and, Other Guidelines

## Vestal Water Supply Well 1-1 Site

| Statute/Regulation/Guideline | Citation | Requirement Synopsis |
|---|---|---|
| U.S. Environmental Protection Agency, Guidance on Remedial Actions for Superfund Sites with PCB Contamination | Office of Solid Waste and Emergency Response (OSWER) Directive 9355.4-01 (August 1990) | Summarizes pertinent considerations in the development, evaluation, and selection of remedial actions at Superfund sites with PCB contamination. Provides a general framework for determining cleanup levels, identifying treatment options, and assessing necessary management controls for residuals. For sites in industrial areas, action levels for PCBs in soils generally should be established within the range of 10 to 25 mg/kg. |
| New York State Restricted Use Soil Cleanup Objectives for Protection of Groundwater | 6 NYCRR § 375-6.8(b) | Establishes soil cleanup objectives at restricted use sites where contamination has been identified in on-site soil and groundwater standards are, or are threatened to be, contravened by the presence of soil contamination at concentrations above the protection of groundwater soil cleanup objectives. |
| New York State Department of Environmental Conservation (NYSDEC), Soil Cleanup Guidance | CP-51, October 2010 | Provides framework and procedures for selection of soil cleanup levels appropriate for cleanup programs in NYSDEC's Division of Environmental Remediation. EPA consulted the guidance only with respect to establishing PCB cleanup levels in soils at the Site. |

# TABLE 13

## Location-Specific ARARs, TBCs and Other Guidelines

## Vestal Water Supply Well 1-1 Site

| Statute/Regulation/Guideline | Citation | Requirement Synopsis |
|---|---|---|
| Executive Order 11988 (Floodplain Management), as amended by Executive Order 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) | Executive Orders 11988 and 13690 | Require federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. Federal agencies are required to avoid adverse impacts or minimize them if there is no practicable alternative. |
| Statement on Procedures on Floodplain Management and Wetlands Protection | 40 CFR Part 6, Appendix A | Sets forth Agency policy and guidance for carrying out the provisions of Executive Orders 11988 and 11990. |
| EPA Policy on Floodplains and Wetland Assessments for CERCLA Actions | OSWER Directive 9280.0-12, 1985 | Superfund actions must meet the substantive requirements of E.O. 11988, E.O. 11990, and 40 CFR Part 6, Appendix A, Federal agencies must evaluate the potential effects of actions they may take in a floodplain to ensure that planning programs and budget requests reflect consideration of flood hazards and floodplain management. . |
| Guidelines for Implementing Executive Order 11988, Floodplain Management, and Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input | October 8, 2015 | Guidelines provide guidance to federal agencies on the implementation of Executive Order 11988, as amended, consistent with the Federal Flood Risk Management Standard, which is a national minimum flood risk management standard to ensure that federal actions located in or near a floodplain when there are no other practical alternatives last as long as intended by considering risks, changes in climate, and vulnerability. |

## TABLE 14

### Action-Specific ARARs, TBCs, and Other Guidelines

### Vestal Water Supply Well 1-1 Site

| Statute/Regulation/Guideline | Citation | Requirement Synopsis |
|---|---|---|
| *Requirements for Hazardous Waste, Solid Waste and PCBs* | | |
| Toxic Substances Control Act | 15 U.S.C. § 2605; 40 CFR 761.61 | Provides cleanup and disposal options for PCB remediation waste. |
| Resource Conservation and Recovery Act (RCRA) Identification and Listing of Hazardous Wastes | 40 C.F.R. Part 261 | Describes criteria for identifying hazardous wastes and lists known hazardous wastes. |
| RCRA Standards Applicable to Generators of Hazardous Waste | 40 C.F.R. Part 262 | Includes manifest, record keeping and other requirement applicable to generators of hazardous wastes. |
| RCRA Preparedness and Prevention | 40 CFR §§ 264.30 - 264.31 | Establishes requirements for safety equipment and spill control when treating, handling and/or storing hazardous wastes. |
| RCRA Land Disposal Restrictions | 40 CFR Part 268 | Identifies hazardous wastes for which land disposal is restricted and provides a set of numerical constituent concentration criteria at which hazardous waste is restricted from land disposal (without treatment). |
| New York Solid Waste Management Regulations | 6 NYCRR Part 360 | Sets standards and criteria for all solid waste management facilities, including design, construction, operation, and closure requirements for the municipal solid waste landfills. |
| New York Identification and Listing of Hazardous Waste | 6 NYCRR Part 371 | Describes methods for identifying hazardous wastes and lists known hazardous wastes. |

## TABLE 14 (cont'd)

## Action-Specific ARARs, TBCs, and Other Guidelines

## Vestal Water Supply Well 1-1 Site

| Statute/Regulation/Guideline | Citation | Requirement Synopsis |
|---|---|---|
| New York State Land Disposal Restrictions | 6 NYCRR Part 376 | Establishes standards for treatment and disposal of hazardous wastes. |
| *Waste Transportation* | | |
| U.S. Department of Transportation Rules for Transportation of Hazardous Materials | 49 CFR Parts 107, 171, 172, 177 to 179 | Outlines procedures for the packaging, labeling, manifesting, and transporting hazardous materials. |
| RCRA Standards Applicable to Transporters of Hazardous Waste | 40 CFR Part 263 | Establishes standards for hazardous waste transporters. |
| New York Waste Transporter Permit Program | 6 NYCRR Part 364 | Governs the collection, transport and delivery of regulated wastes, including hazardous wastes. |
| New York Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities | 6 NYCRR Part 372 | Establishes record keeping requirements and standards related to the manifest system for hazardous wastes. |
| *Groundwater Discharge (Excavation Dewatering)* | | |
| Clean Water Act, *33 U.S.C. §§ 1251-1387* | 40 CFR Parts 122 and 125 | Establishes National Pollutant Discharge Elimination System (NPDES) permit requirements for point source discharges, including the NPDES Best Management Practice Program. These regulations include, but are not limited to, requirements for compliance with water quality standards, a discharge monitoring system, and records maintenance. In accordance with CERCLA Section 121(e), a permit is not required for on-site CERCLA response actions, although the selected remedy will comply with substantive requirements of these regulations. |
| New York Surface Water & Groundwater Quality Standards and Groundwater Effluent Limitations | 6 NYCRR Part 703 | Establishes numerical criteria for groundwater treatment before discharge. |
| New York Regulations on State Pollution Discharge Elimination System (SPDES) | 6 NYCRR Parts 750-757 | Provides standards for Storm Water Runoff, Surface Water, and Groundwater Discharges. In general, no person shall discharge or cause a discharge to NY State waters of any pollutant without a permit under the SPDES program. In accordance with CERCLA Section 121(e), a permit is not required for on-site CERCLA response actions, although the selected remedy will comply with substantive requirements of these regulations. |

## TABLE 14 (cont'd)

## Action-Specific ARARs, TBCs, and Other Guidelines

## Vestal Water Supply Well 1-1 Site

| Statute/Regulation/Guideline | Citation | Requirement Synopsis |
|---|---|---|
| New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations | NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 | Provides groundwater effluent limitations for use where there are no standards in 6 NYCRR ' 703.5 or regulatory effluent limitations in 6 NYCRR ' 703.6. |
| *Off-Gas Management* | | |
| Clean Air Act (CAA)—National Ambient Air Quality Standards (NAAQs) | 40 CFR Part 50 | Provides air quality standards for particulate matter, lead, NO2, SO2, CO, and volatile organic compounds. |
| U.S. Environmental Protection Agency Memorandum - Control of Air Emissions from Superfund Air Strippers | EPA OSWER Directive 9355.0-28 | Provides guidance on the use of controls for Superfund site air strippers as well as other vapor extraction techniques in attainment and non-attainment areas for ozone. |
| New York Emissions Verification | 6 NYCRR Part 202 | Specifies the sampling and documentation requirements for off-gas emissions. |
| New York State Prevention and Control of Air Contamination and Air Pollution, General Prohibitions | 6 NYCRR Part 211 | Prohibits emissions of air contaminants to the outdoor atmosphere of such quantity, characteristic or duration which are injurious to human, plant or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life or property. |
| New York General Process Emission Sources | 6 NYCRR Part 212 | Sets the treatment requirements for certain emission rates. |
| New York Air Quality Standards/ DER-10 | 6 NYCRR Part 257 | Requires that maximum 24-hour concentrations for particulate matter not be exceeded more than once per year. Fugitive dust emissions from site excavation activities must be maintained below 250 micrograms per cubic meter (µg/m3) for any 24-hour period. |
| New York Division of Air Resources DAR-1 (Air Guide-1) AGC/SGC Tables | | Establishes guideline concentrations for toxic ambient air contaminants and outlines the procedures for evaluating sources. |

## TABLE 15

Cost Estimate for *In Situ* Treatment (Areas 3 and 4)
(Both Outside and Beneath Building)
Vestal Water Supply Well 1-1 Superfund Site
Operable Unit 2, Areas 3 and 4

| Item Description | Unit | Qty | Unit Price | Total |
|---|---|---|---|---|
| | | | | |
| Area 3 Pre-Design Site Investigation | LS | 1 | $75,000 | $75,000 |
| Area 3 Excavation (refer to Table 8c) | LS | 1 | $1,373,888 | $1,373,888 |
| Administrative & Technical Plans (ISTT) | LS | 1 | $40,000 | $40,000 |
| Engineering/Institutional Controls | LS | 1 | $60,000 | $60,000 |
| Preliminary Basis of Design | LS | 1 | $30,000 | $30,000 |
| Decommissioning of Existing Monitor Wells | well | 19 | $2,000 | $38,000 |
| Modeling, Design & Procurement | LS | 1 | $320,000 | $320,000 |
| Drilling & ISTT Well Installation | well | 770 | $3,994 | $3,075,380 |
| ISTT Construction, Operation & Monitoring | LS | 1 | $5,364,620 | $5,364,620 |
| Utility Costs | LS | 1 | $1,550,000 | $1,550,000 |
| Abandonment of ISTT Wells | well | 770 | $1,000 | $770,000 |
| Site Restoration | LS | 1 | $130,000 | $130,000 |
| Post-Remedial Confirmation Sampling & Analysis | LS | 1 | $250,000 | $250,000 |
| | | | | |
| **Total Capital Cost** | | | | **$13,076,888** |

ISTT - *in situ* thermal treatment
LS - lump sum
Qty - quantity
Note: Includes all areas, both outside and beneath the building

**TABLE 15** (cont'd)

Cost Estimate: Excavation & Off-Site Disposal - PCB Removal in Area 3

Vestal Water Supply Well 1-1 Superfund Site
Operable Unit 2, Areas 3 and 4

| Item Description | Unit | Qty | Unit Price | Total |
|---|---|---|---|---|
| | | | | |
| Administrative & Technical Plans | LS | 1 | $25,000 | $25,000 |
| Mob/Demob | LS | 1 | $110,000 | $110,000 |
| Sheet Piling (install & remove) | SF | 5,125 | $103.00 | $527,875 |
| Soil Excavation & Loading | CY | 734 | $46.80 | $34,351 |
| Clean Fill (w/placement & compaction) | CY | 740 | $48.30 | $35,742 |
| Transportation - Excavated Soil (w/o pre-treatment) | Tons | 588 | $190 | $111,720 |
| Disposal - Excavated Soil (w/o pre-treatment) | Tons | 588 | $100 | $58,800 |
| Transportation - Excavated Soil (w/pre-treatment) | Tons | 588 | $350 | $205,800 |
| Disposal - Excavated Soil (w/pre-treatment) | Tons | 588 | $450 | $264,600 |
| | | | | |
| **Total Capital Cost** | | | | **$1,373,888** |

Note: Excavation depth 10 feet
Qty - quantity
LS - lump sum
SF - square feet
CY - cubic yards
w/o - without
w/ - with

Note: Assumed 50% of the soil would require off-site pre-treatment

**The total estimated cost for the ISTT and the PCB excavation is as follows:**
**$13,076,88 + $1,373,888 =$14,450,776 ~ $14,500,000**

# APPENDIX III

## ADMINISTRATIVE RECORD INDEX

# COMPREHENSIVE ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

**FINAL**

**09/29/2016**

**REGION ID: 02**

Site Name: VESTAL WATER SUPPLY WELL 1-1
CERCLIS ID: NYD980763767
OUID: 02
SSID: 0238
Action: ROD Amendment

| DocID: | Doc Date: | Title: | Image Count: | Doc Type: | Addressee Name/Organization: | Author Name/Organization: |
|---|---|---|---|---|---|---|
| 318750 | 9/29/2016 | COMPREHENSIVE ADMINISTRATIVE RECORD INDEX FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 14 | ARI / Administrative Record Index | | R02: (US ENVIRONMENTAL PROTECTION AGENCY) |
| 38991 | Undated | INDEX, DOCUMENT NUMBER ORDER, VESTAL #2 DOCUMENTS | 20 | LST / List/Index | | R02: (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56634 | 4/1/1988 | FINAL FIELD OPERATIONS PLAN SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) | 138 | WP / Work Plan | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Beissel, Dennis, R (EBASCO SERVICES INC) |
| 56635 | 4/14/1988 | LETTER SUBMITTING FINAL FIELD OPERATIONS PLAN FOR THE SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) | 1 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56636 | 4/1/1988 | FINAL WORK PLAN - SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY | 99 | WP / Work Plan | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Beissel, Dennis, R (EBASCO SERVICES INC) |
| 56637 | 4/12/1988 | LETTER SUBMITTING FINAL WORK PLAN FOR THE SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) | 3 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56638 | 5/1/1990 | FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION (RI) REPORT | 396 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Weiss, Jonathan (EBASCO SERVICES INCORPORATED) |
| 56639 | 5/16/1990 | LETTER SUBMITTING FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION (RI) REPORT | 2 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56640 | 7/13/1989 | LETTER FORWARDING A COPY OF THE PRELIMINARY DRAFT SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT | 1 | LTR / Letter | R02: Fuller, Kathryn, B (BEVERIDGE & DIAMOND PC) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |

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**09/29/2016**

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CERCLIS ID: NYD980763767
OUID: 02
SSID: 0238
Action: ROD Amendment

| DocID: | Doc Date: | Title: | Image Count: | Doc Type: | Addressee Name/Organization: | Author Name/Organization: |
|---|---|---|---|---|---|---|
| 56641 | 7/11/1990 | LETTER EXPRESSING COMMENT ON FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION REPORT | 2 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Bulman, Donald, A (VESTAL NY TOWN OF) |
| 56642 | 7/11/1990 | LETTER ON BEHALF OF CHENANGO INDUSTRIES REGARDING COMMENTS ON REMEDIAL INVESTIGATION (RI), PROPOSED PLAN, PUBLIC HEALTH EVALUATION AND FEASIBILITY STUDY (FS) | 3 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (BEVERIDGE & DIAMOND PC) |
| 56643 | 7/12/1990 | REVIEW OF FINAL SUPPLEMENTAL REMEDIAL INVESTIGATION (RI), ENDANGERMENT ASSESSMENT (EA) AND FEASIBILITY STUDY (FS) REPORTS | 19 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (FRED C. HART ASSOCIATES INCORPORATED) |
| 56644 | 6/29/1989 | LETTER FORWARDING SEVEN COPIES OF THE PRELIMINARY DRAFTS OF BOTH REMEDIAL INVESTIGATION (RI) AND FEASIBILITY STUDY (FS) FOR REVIEW | 2 | LTR / Letter | R02: Chen, Marsden (NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56645 | 3/9/1989 | LETTER REGARDING AN ACCELERATED SCHEDULE FOR COMPLETING REMEDIAL INVESTIGATION (RI) AND FEASIBILITY STUDY REPORTS | 2 | LTR / Letter | R02: Struble, Richard (WAPORA INCORPORATED) | R02: Beissel, Dennis, R (EBASCO SERVICES INC) |
| 56646 | 8/25/1988 | LETTER FORWARDING THREE COPIES OF FINAL WORK PLAN FOR THE SITE | 1 | LTR / Letter | R02: Campbell, Gary (VESTAL NY TOWN OF) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56647 | 8/25/1988 | LETTER FORWARDING THREE COPIES OF FINAL WORK PLAN FOR THE SITE | 1 | LTR / Letter | R02: Trad, Jeffrey, E (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56648 | 8/16/1988 | LETTER CONFIRMING INTENTION TO SECURE A 90 DAY WARRANT FOR ACCESS TO THE SITE AND STATING THAT EBASCO SHOULD PREPARE TO INITIATE FIELDWORK FOR THE SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) | 1 | LTR / Letter | R02: Beissel, Dennis, R (EBASCO SERVICES INC) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56649 | 6/30/1988 | LETTER FORWARDING A COPY OF REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) ISSUED TO CHENANGO INDUSTRIES AND REQUESTING A RESPONSE | 1 | LTR / Letter | R02: Gouldin, David, M (LEVENE GOULDIN & THOMPSON) | R02: Martinovich, Betty (US ENVIRONMENTAL PROTECTION AGENCY) |

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CERCLIS ID: NYD980763767
OUID: 02
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Action: ROD Amendment

| DocID: | Doc Date: | Title: | Image Count: | Doc Type: | Addressee Name/Organization: | Author Name/Organization: |
|---|---|---|---|---|---|---|
| 56650 | 5/2/1988 | MEMO APPROVING THE FINAL FIELD OPERATIONS PLAN FOR SAMPLING | 1 | MEMO / Memorandum | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Jackson, Amelia (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56651 | 3/4/1988 | LETTER PROVIDING COMMENTS ON THE SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) DRAFT WORK PLAN | 6 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Trad, Jeffrey, E (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |
| 56652 | 1/28/1988 | LETTER FORWARDING A COPY OF DRAFT WORK PLAN FOR SUPPLEMENTAL SOURCE INVESTIGATION AND FEASIBILITY STUDY (FS) FOR REVIEW AND COMMENT | 1 | LTR / Letter | R02: Trad, Jeffrey, E (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56653 | 1/27/1988 | MEMO FORWARDING RATIONALE CONCERNING THE USE OF BRASS LINERS FOR SOIL SAMPLES | 1 | MEMO / Memorandum | R02: Von Schondorf, Amy (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56654 | 1/21/1988 | LETTER REGARDING USE OF BRASS LINERS FOR SUBSURFACE SOIL SAMPLING | 2 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Beissel, Dennis, R (EBASCO SERVICES INC) |
| 56655 | 1/15/1988 | LETTER PROVIDING NOTIFICATION THAT EPA AND NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC) ARE PREPARING TO CONDUCT A SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) OF STAGE ROAD INDUSTRIAL PARK AREA | 2 | LTR / Letter | R02: Bulman, Donald, A (VESTAL NY TOWN OF) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56656 | 12/22/1987 | PRESENTATION FOR SCOPING MEETING FOR SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) | 37 | RPT / Report | | R02: (EBASCO SERVICES INC) |
| 56657 | 12/3/1987 | LETTER SUMMARIZING ITEMS COVERED DURING 11/25/87 KICK OFF MEETING | 2 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |

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|---|---|---|---|---|---|---|
| 56658 | 4/6/1987 | LETTER IN RESPONSE TO 3/16/87 LETTER, AGREEING TO TRANSFER LEAD AGENCY DESIGNATION TO USEPA FOR THE COMPLETION OF SUPPLEMENTAL REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) | 1 | LTR / Letter | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Nosenchuck, Norman, H (NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION) |
| 56659 | 3/16/1987 | LETTER REQUESTING THAT LEAD AGENCY DESIGNATION BE TRANSFERRED TO USEPA | 2 | LTR / Letter | R02: Nosenchuck, Norman, H (NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56660 | 5/1/1990 | FINAL SUPPLEMENTAL FEASIBILITY STUDY (FS) REPORT | 247 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Weiss, Jonathan (EBASCO SERVICES INCORPORATED) |
| 56661 | 5/16/1990 | LETTER SUBMITTING FINAL SUPPLEMENTAL FEASIBILITY STUDY (FS) REPORT | 2 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56662 | 5/1/1990 | SUPERFUND PROPOSED PLAN | 16 | WP / Work Plan | | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56663 | 4/16/1990 | LETTER REGARDING COMMENTS ON THE DRAFT PROPOSED REMEDIAL ACTION PLAN (PRAP) | 3 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |
| 56664 | 4/4/1990 | LETTER EXPRESSING ADDITIONAL CONCERNS FOR FINAL DRAFT SUPPLEMENTAL FEASIBILITY STUDY (FS) REPORT | 2 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |
| 56665 | 4/2/1990 | LETTER FORWARDING THE DRAFT PROPOSED PLAN FOR REVIEW AND COMMENT | 1 | LTR / Letter | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56666 | 3/5/1990 | LETTER REGARDING COMMENTS ON DRAFT FINAL SUPPLEMENTAL FEASIBILITY STUDY (FS) | 3 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |

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|---|---|---|---|---|---|---|
| 56667 | 2/16/1990 | LETTER REGARDING COMMENTS ON DRAFT FINAL SUPPLEMENTAL FEASIBILITY STUDY (FS) AND DRAFT ENVIRONMENTAL ASSESSMENT | 2 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |
| 56668 | 2/1/1990 | LETTER FORWARDING COPIES OF THE REVISED DRAFT FEASIBILITY STUDY (FS) AND DRAFT ENVIRONMENTAL ASSESSMENT FOR STATE REVIEW | 1 | LTR / Letter | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56669 | 6/26/1989 | LETTER TRANSMITTING DRAFT SUPPLEMENTAL FEASIBILITY STUDY (FS) REPORT | 1 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56670 | 7/13/1990 | LETTER FORWARDING SUGGESTED REVISIONS TO THE DRAFT RECORD OF DECISION (ROD) | 1 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |
| 56671 | 10/3/1988 | LETTER ON BEHALF OF CHENANGO INDUSTRIES CHALLENGING RESULTS AS STATED IN RECORD OF DECISION (ROD) FOR THE FIRST OPERABLE UNIT 01 | 1 | LTR / Letter | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Gouldin, David, M (LEVENE GOULDIN & THOMPSON) |
| 56672 | 2/12/1987 | LETTER INDICATING THAT NO CONFLICTS OR PROBLEMS HAVE BEEN IDENTIFIED IN FEDERAL FUNDING APPLICATION | 1 | LTR / Letter | R02: Marshall, James, R (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Cowan, James, P (NEW YORK STATE CLEARINGHOUSE) |
| 56673 | 7/28/1989 | LETTER IN RESPONSE TO 7/13/89 LETTER INDICATING THAT NO FEDERALLY LISTED OR PROPOSED ENDANGERED OR THREATENED SPECIES ARE KNOWN TO EXIST IN VICINITY OF SITE | 1 | LTR / Letter | R02: Hargrove, Robert, W (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Corin, Leonard, P (US DEPARTMENT OF INTERIOR) |
| 56674 | 7/13/1989 | LETTER REQUESTING A WRITTEN STATEMENT INDICATING WHETHER ANY ENDANGERED OR THREATENED SPECIES ARE LISTED OR PROPOSED TO BE LISTED IN THE VICINITY OF SITE | 1 | LTR / Letter | R02: Corin, Leonard, P (US DEPARTMENT OF INTERIOR) | R02: Hargrove, Robert, W (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56675 | 7/24/1990 | SPECIAL NOTICE LETTER TO PRPS FOR REMEDIAL DESIGN / REMEDIAL ACTION | 5 | LTR / Letter | R02: Stack, Joseph, M (CHENANGO INDUSTRIES) | R02: Caspe, Richard, L (US ENVIRONMENTAL PROTECTION AGENCY) |

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|---|---|---|---|---|---|---|
| 56676 | 6/22/1990 | LETTER REGARDING RESPONSE TO SUPPLEMENTAL REQUEST FOR INFORMATION | 2 | LTR / Letter | R02: Caspe, Richard, L (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Guiles, Neil, I (VESTAL ASPHALT) |
| 56677 | 5/4/1990 | 104(E) REQUEST FOR INFORMATION LETTER | 13 | LTR / Letter | R02: Boreen, Henry, I (TRANSFORMERS INCORPORATED) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56678 | 2/26/1990 | LETTER REGARDING CHENANGO INDUSTRIES' RESPONSE TO SUPPLEMENTAL REQUEST FOR INFORMATION | 9 | LTR / Letter | R02: Drazan, Daniel (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Kurkoski, Scott (LEVENE GOULDIN & THOMPSON) |
| 56679 | Undated | EXHIBIT A CHENANGO INDUSTRIES HAZARDOUS WASTE MANIFESTS (CONFIDENTIAL) | 1 | FRM / Form | | R02: (CHENANGO INDUSTRIES) |
| 56680 | 7/17/1979 | EXHIBIT B: LETTER DETAILING WASTEWATER DISCHARGE FROM PUMP STATION | 2 | LTR / Letter | R02: Crounse, Gary, J (CHENANGO INDUSTRIES) | R02: Gingold, Neil, M (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) |
| 56681 | 4/2/1979 | EXHIBIT C: LETTER DETAILING WASTEWATER DISCHARGE AND CORRECTIVE ACTIONS TAKEN | 3 | LTR / Letter | R02: Turkki, Eric (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) | R02: Crounse, Gary, J (CHENANGO INDUSTRIES) |
| 56682 | 8/23/1974 | EXHIBIT D LETTER DETAILING WASTEWATER DISCHARGE AND SANITARY SYSTEM TESTING DONE AT CHENANGO INDUSTRIES 8/21/74 | 3 | LTR / Letter | R02: Austin, Roland (BROOME NY, COUNTY OF) | R02: Herrick, W, T (R J MARTIN) |
| 56683 | 2/8/1980 | DEED FOR CHENANGO INDUSTRIES PROPERTY TO BROOME COUNTY INDUSTRIAL DEVELOPMENT AGENCY | 1 | OTH / Other | R02: (BROOME NY, COUNTY OF) | R02: (CHENANGO INDUSTRIES) |
| 56684 | 1/31/1990 | LETTER FORWARDING ATTACHED COMPLETED SWORN STATEMENT OF GARY WARFLE OF STAGE CONSTRUCTION, IN RESPONSE TO THE 104E LETTER | 5 | LTR / Letter | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Becker, Bruce, O (BECKER CARD & LEVY) |
| 56685 | 1/9/1990 | LETTER REQUESTING SUPPLEMENTAL INFORMATION | 10 | LTR / Letter | R02: Stack, Joseph, M (CHENANGO INDUSTRIES) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56686 | 1/9/1990 | 104(E) REQUEST FOR INFORMATION | 9 | LTR / Letter | R02: Warfle, Gary, L (STAGE CONSTRUCTION CORPORATION) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |

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| 56687 | 1/9/1990 | 104(E) LETTER REQUESTING SUPPLEMENTAL INFORMATION | 11 | LTR / Letter | R02: Stack, Joseph, M (CHENANGO INDUSTRIES) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56688 | 12/27/1989 | FOLLOW-UP LETTER TO RESPONSE TO SUPPLEMENTAL REQUEST FOR INFORMATION | 1 | LTR / Letter | R02: Negrelli, Michael (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Guiles, Neil, I (VESTAL ASPHALT) |
| 56689 | 12/15/1989 | LETTER REGARDING RESPONSE TO REQUEST FOR SUPPLEMENTAL INFORMATION | 4 | LTR / Letter | R02: Negrelli, Michael (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Guiles, Neil, I (VESTAL ASPHALT) |
| 56690 | 2/1/1980 | DEED BETWEEN NEIL GUILES AND NEIL GUILES EXCAVATING & PAVING INC | 3 | OTH / Other | R02: (NEIL GUILES ASPHALT) | R02: Guiles, Neil, I (VESTAL ASPHALT) |
| 56691 | 1/31/1986 | DEED BETWEEN GARY WARFLE ET AL AND VESTAL ASPHALT INC | 3 | OTH / Other | R02: (VESTAL ASPHALT) | R02: Warfle, Gary, L (STAGE CONSTRUCTION CORPORATION) |
| 56692 | 11/30/1989 | 104(E) LETTER REQUESTING SUPPLEMENTAL INFORMATION | 5 | LTR / Letter | R02: Guiles, Neil, I (VESTAL ASPHALT) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56693 | 10/9/1989 | LETTER IN RESPONSE TO 104(E) LETTER, STATING THAT THE TOWN DOES NOT OWN THE PROPERTY BUT HAS FILED SUIT AGAINST CHENAGO INDUSTRIES | 1 | LTR / Letter | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Gorman, Daniel, L (VESTAL NY TOWN OF) |
| 56694 | 9/15/1989 | 104(E) LETTER REQUESTING INFORMATION | 10 | LTR / Letter | R02: Fairbrother, Rose, M (VESTAL NY TOWN OF) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56696 | 5/25/1989 | DRAFT 104(E) LETTER REQUESTING INFORMATION | 12 | LTR / Letter | R02: (FIRE DEPT VESTAL NY) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56698 | 5/10/1989 | DRAFT 104(E) LETTER REQUESTING INFORMATION | 12 | LTR / Letter | R02: Yeverton, Tom (RODRIGUEZ RESTAURANT) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |

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| 56700 | 6/16/1988 | LETTER IN RESPONSE TO SPECIAL NOTICE LETTER STATING THAT VESTAL ASPHALT IS NOT AGREEABLE TO FUND THE PROPOSED REMEDIAL ACTION | 1 | LTR / Letter | R02: Martinovich, Betty (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Butler, Earl, D (BUTLER ALLEN & CLARK) |
| 56702 | 6/2/1988 | VESTAL WATER SUPPLY WELL 1-1 RI/FS SPECIAL NOTICE LETTER | 3 | LTR / Letter | R02: Stack, Joseph, M (CHENANGO INDUSTRIES) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56703 | 5/27/1988 | VESTAL WATER SUPPLY WELL 1-1 RI/FS SPECIAL NOTICE LETTER | 3 | LTR / Letter | R02: Guiles, Neil, I (VESTAL ASPHALT) | R02: Luftig, Stephen (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56704 | 8/15/1986 | LETTER AND ATTACHED MATERIAL REGARDING ADDITIONAL RESPONSES TO A SECOND REQUEST FOR ADDITIONAL INFORMATION | 5 | LTR / Letter | R02: Henry, Sherrel, D (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Guiles, Neil, I (VESTAL ASPHALT) |
| 56705 | 7/31/1986 | LETTER IN RESPONSE TO 05/30/86 REQUEST FOR INFORMATION | 1 | LTR / Letter | R02: Henry, Sherrel, D (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Guiles, Neil, I (VESTAL ASPHALT) |
| 56706 | 8/4/1986 | SECOND REQUEST FOR INFORMATION LETTER | 7 | LTR / Letter | R02: Guiles, Neil, I (VESTAL ASPHALT) | R02: Librizzi, William (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56707 | Undated | RESPONSE TO EPA INFORMATION REQUEST WITH HAZARDOUS WASTE MANIFESTS ATTACHED (CONFIDENTIAL) | 1 | FRM / Form | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (CHENANGO INDUSTRIES) |
| 56710 | 5/30/1986 | 104(E) LETTER REQUESTING INFORMATION; ALSO WENT TO CHENANGO INDUSTRIES | 8 | LTR / Letter | R02: Guiles, Neil, I (VESTAL ASPHALT) | R02: Librizzi, William (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56711 | 5/23/1990 | LETTER RESPONDING TO 05/04/90 REQUEST FOR INFORMATION LETTER | 1 | LTR / Letter | R02: Drazan, Daniel (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Boreen, Henry, I (TRANSFORMERS INCORPORATED) |
| 56713 | 10/20/1989 | LETTER IN RESPONSE TO 8/9/89 FOIA REQUEST, LISTING DOCUMENTS IN EPA'S POSSESSION IN CONNECTION WITH THE VESTAL WELL 1-1 SITE | 2 | LTR / Letter | R02: Woroboff, Margo (BEVERIDGE & DIAMOND PC) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |

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|---|---|---|---|---|---|---|
| 56715 | 8/9/1989 | LETTER REGARDING FOIA REQUEST FOR ALL DOCUMENTS IN EPA POSSESSION PREPARED IN CONNECTION WITH THE VESTAL WELL 1-1 SITE | 2 | LTR / Letter | R02: Vasquez, Wanda (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Fuller, Kathryn, B (BEVERIDGE & DIAMOND PC) |
| 56717 | 3/15/1988 | LETTER INDICATING THAT JACK NORMAN IS THE PERSON TO CONTACT WITH REGARD TO ANY PROPOSED TESTING AND NECESSARY ACCESS TO THE CHENANGO INDUSTRIES PROPERTY | 1 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Gouldin, David, M (LEVENE GOULDIN & THOMPSON) |
| 56719 | 5/1/1990 | FINAL PUBLIC HEALTH EVALUATION VESTAL WELL 1-1 SITE | 154 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Weiss, Jonathan (EBASCO SERVICES INCORPORATED) |
| 56720 | 5/16/1990 | LETTER SUBMITTING FINAL PUBLIC HEALTH EVALUATION REPORT | 2 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56722 | 7/14/1988 | HEALTH ASSESSMENT FOR VESTAL WATER SUPPLY WELL 1-1 | 6 | RPT / Report | | R02: Howie Jr, Max, M (AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY) |
| 56723 | 7/26/1989 | LETTER FORWARDING COPIES OF THE DRAFT PUBLIC HEALTH EVALUATION FOR REVIEW AND COMMENT | 1 | LTR / Letter | R02: Lister, James, B (NY STATE DEPT OF ENVIRONMENTAL CONSERVATION (NYSDEC)) | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56724 | 12/1/1989 | FINAL COMMUNITY RELATIONS PLAN FOR THE VESTAL WELL 1-1 SUPERFUND SITE | 38 | WP / Work Plan | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Giordano, Joanne (ICF TECHNOLOGY, INC) |
| 56725 | 12/18/1989 | LETTER SUBMITTING FINAL COMMUNITY RELATIONS PLAN | 2 | LTR / Letter | R02: Alvi, M Shaheer (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Sachdev, Dev, R (EBASCO SERVICES INC) |
| 56726 | 5/18/1990 | AFFIDAVIT OF PUBLICATION OF NOTICE OF PUBLIC COMMENT PERIOD | 2 | OTH / Other | | R02: Johnson, Phyllis (BINGHAMTON PRESS COMPANY) |
| 56727 | 6/14/1990 | LETTER FORWARDING MINUTES OF 5/31/90 PUBLIC MEETING HELD IN VESTAL NY | 1 | LTR / Letter | R02: Giordano, Joanne (ICF TECHNOLOGY, INC) | R02: Collins, Lilas, M (COLLINS STRATEGIC BUSINESS SERVICES) |

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| 56728 | 5/31/1990 | PUBLIC MEETING HELD AT VESTAL, NY - MINUTES OF MEETING | 22 | MTG / Meeting Document | | R02: Collins, Lilas, M (COLLINS STRATEGIC BUSINESS SERVICES) |
| 56729 | 5/21/1990 | NEWS RELEASE TITLED : EPA ANNOUNCES PROPOSED CLEANUP REMEDY FOR SECOND OPERABLE UNIT FOR THE STAGE INDUSTRIAL PARK | 2 | PUB / Publication | | R02: Echols, Cecilia (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56730 | 11/1/1989 | SUPERFUND UPDATE: VESTAL WELL 1-1 SITE | 3 | PUB / Publication | | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) |
| 56731 | 5/15/1990 | MEMO REGARDING COMMUNITY RELATIONS ACTIVITIES WHICH HAVE BEEN SCHEDULED FOR VESTAL WELL 1-1 SITE | 1 | MEMO / Memorandum | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Giordano, Joanne (ICF TECHNOLOGY, INC) |
| 56732 | 11/2/1989 | LETTER FORWARDING COPIES OF THE FACT SHEET AND ATTACHED SUPERFUND SITE MAILING LIST | 18 | LTR / Letter | R02: Als, Edward (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Giordano, Joanne (ICF TECHNOLOGY, INC) |
| 351693 | 9/27/1990 | RECORD OF DECISION FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE (INCLUDES APPENDIX 3: RECORD OF DECISION FOR OU1) | 129 | RPT / Report | | R02: Sidamon-eristoff, Constantine (US ENVIRONMENTAL PROTECTION AGENCY) |
| 152209 | 7/13/2006 | TRIP REPORT - SOIL GAS SAMPLING FOR VESTAL WATER SUPPLY WELL 1-1 | 50 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |
| 436166 | 12/14/2006 | NYSDEC DIVISION OF ENVIRONMENTAL REMEDIATION 6 NYCRR PART 375 - ENVIRONMENTAL REMEDIATION PROGRAMS SUBPARTS 375-1 TO 375-4 & 375-6 | 89 | RPT / Report | | R02: (NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION) |
| 152210 | 2/15/2007 | TRIP REPORT - SOIL AND GROUNDWATER SAMPLING FOR VESTAL WATER SUPPLY WELL 1-1 | 283 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |
| 152211 | 4/21/2008 | TRIP REPORT - SOIL SAMPLING FOR VESTAL WATER SUPPLY WELL 1-1 | 148 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |

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| 152212 | 10/20/2008 | TRIP REPORT - GROUNDWATER AND SOIL SAMPLING FOR VESTAL WATER SUPPLY WELL 1-1 | 136 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |
| 152213 | 6/8/2009 | TRIP REPORT - GROUNDWATER AND SOIL SAMPLING FOR VESTAL WATER SUPPLY WELL 1-1 | 80 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |
| 152214 | 8/27/2009 | TRIP REPORT - MONITOR WELL INSTALLATION FOR VESTAL WATER SUPPLY WELL 1-1 | 29 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Woodruff, Ken (LOCKHEED MARTIN TECHNOLOGY SERVICES) |
| 152208 | 2/16/2010 | WORK PLAN FOR WORK ASSIGNMENT NO. SERAS-064 FOR VESTAL WATER SUPPLY WELL 1-1 | 9 | WP / Work Plan | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |
| 152203 | 8/23/2010 | HEALTH AND SAFETY PLAN MODIFICATIONS FOR VESTAL WATER SUPPLY WELL 1-1 | 289 | WP / Work Plan | | R02: (US ENVIRONMENTAL PROTECTION AGENCY) |
| 351691 | 9/29/2010 | ANALYTICAL REPORT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 15 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INFORMATION SYSTEMS & GLOBAL SOLUTIONS) |
| 436165 | 10/21/2010 | NYSDEC POLICY CP-51 - SOIL CLEANUP GUIDANCE | 21 | RPT / Report | | R02: (NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION) |
| 152215 | 8/30/2011 | SITE FIELD ACTIVITIES IN 2010 - WORK ASSIGNMENT 0-064 FOR VESTAL WATER SUPPLY WELL 1-1 | 78 | MEMO / Memorandum | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES) |
| 351702 | 3/28/2012 | PRELIMINARY FEASIBILITY ASSESSMENT OF EXCAVATION & OFFSITE DISPOSAL AND ELECTRICAL RESISTIVE HEATING REMEDIAL OPTIONS FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 13 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Patel, Dan (LOCKHEED MARTIN INCORPORATED), R02: Leuser, Rick (LOCKHEED MARTIN INC), R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES), R02: Miller, Dennis, A (LOCKHEED MARTIN/REAC) |
| 183151 | 4/4/2012 | PRELIMINARY CONCEPTUAL SITE MODEL TECHNICAL MEMORANDUM FOR VESTAL WATER SUPPLY WELL 1-1 SITE | 64 | MEMO / Memorandum | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES) |

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| 351703 | 8/7/2012 | WORK PLAN FOR WORK ASSIGNMENT NO. SERAS-064 AMENDMENT 1 FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 6 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 351696 | 12/25/2012 | ANALYSIS REPORT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 39 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 351701 | 4/12/2013 | ADDITIONAL SITE CHARACTERIZATION TO SUPPORT A HUMAN HEALTH RISK ASSESSMENT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 18 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Leuser, Rick (LOCKHEED MARTIN INC), R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES), R02: Miller, Dennis, A (LOCKHEED MARTIN/REAC) |
| 351694 | 7/18/2013 | PATHWAYS ANALYSIS REPORT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 55 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 351697 | 9/9/2013 | ANALYSIS REPORT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 29 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 218235 | 9/26/2013 | FIVE-YEAR REVIEW REPORT FOR THE VESTAL WATER SUPPLY 1-1 SITE | 43 | RPT / Report | | R02: Mugdan, Walter (US ENVIRONMENTAL PROTECTION AGENCY) |
| 351698 | 2/21/2014 | DIRECTIONAL DRILLING BENEATH ON-SITE BUILDING FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 132 | RPT / Report | R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Leuser, Rick (LOCKHEED MARTIN INC), R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES), R02: Mulrooney, Pat (LOCKHEED MARTIN / SERAS) |
| 351690 | 4/17/2014 | FINAL FLOW AND CONTAMINANT TRANSPORT MODELS OF 1,1,1- TRICHLOROETHANE AND TRICHLOROETHENE IN GROUNDWATER FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 51 | LTR / Letter | R02: Johnson, Terrence (LOCKHEED MARTIN INC) | R02: Leuser, Rick (LOCKHEED MARTIN INC), R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES), R02: Taylor, Kevin (LOCKHEED MARTIN INFORMATION SYSTEMS & GLOBAL SOLUTIONS) |

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| 351695 | 1/13/2015 | PATHWAYS ANALYSIS REPORT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 351 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 351704 | 2/25/2015 | WORK PLAN FOR WORK ASSIGNMENT NO. SERAS-064 AMENDMENT 2 FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 5 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 319510 | 6/30/2015 | FINAL REPORT CONCEPTUAL SITE MODEL NON-AQUEOUS PHASE LIQUID NAPL SOURCES REPLACES THE PRELIMINARY CONCEPTUAL SITE MODEL FOR VESTAL WATER SUPPLY WELL 1-1 SITE | 116 | RPT / Report | R02: (ERT), R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN INCORPORATED) |
| 351699 | 9/3/2015 | TECHNICAL MEMORANDUM SCREENING ECOLOGICAL RISK ASSESSMENT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 8 | RPT / Report | R02: Charters, David, W (US ENVIRONMENTAL PROTECTION AGENCY), R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES), R02: Kracko, Karen (LOCKHEED MARTIN INFORMATION SYSTEMS & GLOBAL SOLUTIONS) |
| 351692 | 12/22/2015 | FINAL HUMAN HEALTH RISK ASSESSMENT REPORT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 326 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 396460 | 2/1/2016 | SAMPLING REPORT AND DATA PRESENTATION OU2 GROUNDWATER SAMPLING FEBRUARY 1-3 2016 FOR VESTAL WATER SUPPLY WELL 1-1 SITE | 147 | RPT / Report | | R02: Jackson, Amelia (US ENVIRONMENTAL PROTECTION AGENCY), R02: Mercado, Michael (US ENVIRONMENTAL PROTECTION AGENCY) |
| 351705 | 3/24/2016 | WORK PLAN FOR WORK ASSIGNMENT NO. SERAS-064 AMENDMENT 3 FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 5 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: (LOCKHEED MARTIN / SERAS) |
| 351700 | 5/24/2016 | AMENDED TECHNICAL MEMORANDUM SCREENING ECOLOGICAL RISK ASSESSMENT FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 8 | RPT / Report | R02: Charters, David, W (US ENVIRONMENTAL PROTECTION AGENCY), R02: Johnson, Terrence (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Aloysius, Dave (LOCKHEED MARTIN TECHNOLOGY SERVICES), R02: Kracko, Karen (LOCKHEED MARTIN INFORMATION SYSTEMS & GLOBAL SOLUTIONS) |

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| DocID: | Doc Date: | Title: | Image Count: | Doc Type: | Addressee Name/Organization: | Author Name/Organization: |
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| 436164 | 8/17/2016 | FOCUSED FEASIBILITY STUDY FOR OU2 - AREAS 3 AND 4 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 126 | RPT / Report | | R02: (US ENVIRONMENTAL PROTECTION AGENCY), R02: (LOCKHEED MARTIN / SERAS) |
| 393181 | 8/18/2016 | PROPOSED PLAN FOR OU2 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 18 | WP / Work Plan | | R02: (US ENVIRONMENTAL PROTECTION AGENCY) |
| 393253 | 8/24/2016 | FINAL FOCUSED FEASIBILITY STUDY REPORT FOR OU2 - AREAS 3 AND 4 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 130 | RPT / Report | R02: (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Taylor, Kevin (LOCKHEED MARTIN INFORMATION SYSTEMS & GLOBAL SOLUTIONS), R02: Aloysius, David (LOCKHEED MARTIN / SERAS) |
| 451826 | 6/3/2015 | TRIP REPORT - SOIL VAPOR INTRUSION STUDY - AREA 4 FOR THE VESTAL WATER SUPPLY WELL 1-1 SITE | 140 | RPT / Report | R02: Mugdan, Walter, E (US ENVIRONMENTAL PROTECTION AGENCY) | R02: Pedersen, Mark, J (NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION) |

# APPENDIX IV

## NEW YORK STATE
## CONCURRENCE LETTER

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

**Division of Environmental Remediation, Office of the Director**
625 Broadway, 12th Floor, Albany, New York 12233-7011
P: (518) 402-9706 | F: (518) 402-9020
www.dec.ny.gov

Mr. Walter E. Mugdan, Director
Emergency and Remedial Response Division
United States Environmental Protection Agency
Region 2
290 Broadway, Floor 19
New York, New York 10007-1866

RE: Vestal Water Supply Site 1-1, Site No. 704009A
200 Stage Road, ROD Amendment-OU2
New York State Concurrence

Dear Mr. Mugdan:

The New York State Department of Environmental Conservation (DEC) and the New York State Department of Health (DOH) have reviewed the Record of Decision (ROD) Amendment (dated September 2016) for the subject site. We understand the remedy for this site addresses contaminated soil, designated as United States Environmental Protection Agency (EPA) Operable Unit 2 (DEC Operable Unit 02). The remedy includes:

- treatment of volatile organic compound (VOC)-contaminated soils utilizing Thermal Conductive Heating (TCH), Steam Enhanced Extraction (SEE), Electrical Resistance Heating (ERH), or some combination of these three technologies based upon remedial design evaluation;
- excavation of PCB-contaminated soils to a depth of approximately 10 feet yielding approximately 730 cubic yards of soils; and
- implementation of Institutional Controls to limit future use of the Stage Road property to commercial/light industrial uses or other more restricted uses (*e.g.*, industrial, etc.).

Based on this information, we concur with the ROD Amendment for remediation of Vestal Water Supply (Site 1-1) Operable Unit 02.

If you have any questions or need additional information, please contact the Project Manager for this site, Mr. Payson Long, at (518) 402-9813.

Sincerely,

Robert W. Schick, P.E.
Director
Division of Environmental Remediation

ec: Damian Duda, EPA
Salvatore Baldamenti, EPA
Krista Anders, DOH
Anthony Perretta, DOH
Michael Cruden, DEC
Susan Edwards, DEC
Payson Long, DEC
Harry Warner, Region 7

# APPENDIX V

## RESPONSIVENESS SUMMARY

**APPENDIX V**

**RESPONSIVENESS SUMMARY**

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**RESPONSIVENESS SUMMARY**
**FOR THE**
**OPERABLE UNIT TWO RECORD OF DECISION AMENDMENT**
**VESTAL WATER SUPPLY WELL 1-1 SUPERFUND SITE**
**TOWN OF VESTAL, BROOME COUNTY, NEW YORK**

## INTRODUCTION

A responsiveness summary is required by the regulations promulgated under the Superfund statute. It provides a summary of significant comments received during the public comment period, as well as the responses of the U.S. Environmental Protection Agency (EPA) to those comments. All significant comments received were considered by EPA in its final Record of Decision (ROD) regarding the selection of Operable Unit Two (OU2) amended remedy for the Vestal Water Supply Well 1-1 Site (Site).

## SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The Proposed Plan for the OU2 amended remedy for the 200 Stage Road portion of the Site, attached hereto as Attachment 1, was released to the public on Tuesday, August 23, 2016, along with supporting documentation which comprises the Administrative Record for OU2. EPA's preferred remedy and the basis for that preference were identified in the Proposed Plan.

The supporting documentation, including the Proposed Plan, were made available to the public in information repositories maintained at the EPA Superfund Records Center at the Region 2 Office located at 290 Broadway, 18$^{th}$ Floor, New York, New York and at the Vestal Public Library at 320 Vestal Parkway, East Vestal, New York.

A public notice, attached herein as Attachment 2, was published in Press-Sun Bulletin, a local newspaper, on Monday, August 22, 2016. The notice announced the commencement of the public comment period, the public meeting date, a description of the preferred remedy, EPA contact information and the availability of the above-referenced documents. The public comment period ended on Wednesday, September 21, 2016.

EPA conducted a public meeting on Tuesday, August 30, 2016 at 7:00 P.M. at the Vestal Town Hall at 602 Vestal Parkway West, Vestal, New York to answer questions from the public about the remedial alternatives and the proposed remedy. Copies of the public meeting sign-in sheets and a transcript of the meeting are attached, hereto as Attachments 3 and 4, respectively. EPA's responses to the comments and questions received at the public meeting are included in this Responsiveness Summary.

## SUMMARY OF COMMENTS AND EPA RESPONSES

EPA received comments and/or questions the public meeting. There were no written comments submitted during the public comment period. A summary of the significant comments made at the public meeting, as well as EPA's responses, are provided below under various categories.

A. SITE HISTORY

Comment #1: Two commenters wanted to know 1) the source of soil and groundwater contamination found at the Site and 2) the location of the contamination found at the Site.

EPA Response #1: Historically, the industrial activities that had been conducted at the building at 200 Stage Road were the source of soil and groundwater contamination at the Site. The operations in the building had been used for the manufacture of circuit boards. During the manufacturing process, a number of chlorinated solvents or volatile organic compounds (VOCs) were used for cleaning and degreasing equipment. These compounds eventually found their way into the soils at 200 Stage Road which, in turn, contaminated the groundwater. The primary VOC-contaminated soils are located in Area 3 and Area 4 at 200 Stage Road, on the northeast and southern sides of the building. With respect to the PCB contamination, former transformer manufacturing at 200 Stage Road resulted in the release of PCBs into the soils.

Comment #2: One commenter wanted to know if the finding of PCBs was recent, whether or not it was classified as a separate contamination area, and whether or not PCBs are found in the groundwater.

EPA Response #2: During the original OU2 remedial investigation, low levels of PCBs were found in two samples in Area 2 (located to the southwest of 200 Stage Road) and one sample in Area 4 of the Stage Road Industrial Park (SRIP). At the time, the concentrations of PCBs were found to be below EPA's soil cleanup levels. As a result, remediation of the PCBs was not a component of the original OU2 remedy. Subsequently, beginning in 2006, EPA's very comprehensive soil and groundwater investigation found PCBs in the soils in both Areas 3 and 4. However, the concentration of PCBs in soils in Area 3 only were found to be above EPA's remediation goals (RGs) and require remediation. Low levels of PCBs are also associated with the non-aqueous phase liquid (NAPL) in groundwater found in Area 3. In general, PCBs are not very mobile in groundwater, and have not been found in groundwater at the Site.

Comment #3: Two commenters wanted to know about the previous treatment that EPA implemented at the Site, prior to the current situation.

EPA Response #3: Four discrete areas of the SRIP had been investigated for soil contamination, prior to the release of the OU2 ROD. Area 1 in the western portion of the SRIP and Area 3 in the eastern portion of the SRIP were found to have relatively little contamination and, at the time, did not require remediation. Also, Area 2 and Area 4 were found to contain VOC-contamination which required remediation. In December 1997, EPA constructed a soil vapor extraction system (SVE) to remediate the contaminated soils in Area 2. The SVE system successfully removed the contaminated soils in Area 2, and EPA terminated the system in November 2000. In June 2003, a separate SVE system was installed in Area 4 to remediate the VOC-contaminated soils located there. Operation of the Area 4 SVE system was terminated in January 2006, because it was not successful in removing VOCs from those soils.

Comment #4: One commenter wanted to know whether or not the soil contamination has expanded from 200 Stage Road.

EPA Response #4: Beginning in 2006, after the SVE system in Area 4 was shut down, EPA further investigated the soils and groundwater at 200 Stage Road, specifically, Area 3 and Area 4. EPA determined the nature and extent of soil contamination in that investigation performed over an approximate eight-year time period. The investigation included the installation of additional monitoring wells, the sampling of groundwater, the drilling and sampling of boreholes and the sampling of surface and subsurface soils. Considering all the data that have been collected over the past eight years, EPA is confident that the delineation of soil contamination is complete and that contaminated soils do not extend beyond 200 Stage Road.

Comment #5: One commenter wanted to know when EPA would determine whether the OU2 remedy is a success.

EPA Response #5: The VOCs are chlorinated solvents which are trapped within the soil matrix and adhere to the soil particles. Groundwater becomes contaminated when it contacts these VOC-contaminated soils and when precipitation picks up the VOC-contamination in the unsaturated soils as it recharges the aquifer. As long as the contaminated soils, *i.e.*, the source of groundwater contamination, are present, groundwater will continue to be impacted. Once the soil remediation goals have been achieved, the soil remedy will be classified as a success and, ultimately, EPA expects that the groundwater will be restored to drinking water standards.

B. PREFERRED REMEDY

Comment #6: One commenter wanted to know if the thermal treatment process works on the VOC contaminants.

EPA Response #6: The in situ thermal treatment (ISTT) is specifically intended to address VOC contamination in soils. As a result of the high heat that is applied to the VOC-contaminated soils, the ISTT will remediate not only the VOC contaminants of concern but also any other residual VOC and semi-volatile organic compounds (SVOCs) contamination that may be in the soils.

Comment #7: One commenter wanted more explanation about the differences in the remedial alternatives, *i.e.*, excavation of all soils versus excavation of some soils and thermally treating the remaining soils.

EPA Response #7: Under Alternative R2, all soils would be excavated and, if required, treated off-Site prior to landfill disposal. Under Alternative R3, ISTT is the preferred method for removing VOC-contamination from soils. Under Alternative R3, the VOC-contaminated soils in Area 4 will be treated in place so the extra step of excavating the soils will not be necessary. Alternative R3 does, however, include excavation of the PCB-contaminated soils. This is a much smaller-scale soil excavation than that for Alternative R2. There is less short-term risk to the community with Alternative R3. Excavation of contaminated soils under Alternative R2 would entail more fugitive air emissions, as well as many more trucks moving contaminated soils through the community. Also, Alternative R2 would require the excavation of soils below the water table which may require the installation of sheet piling, dewatering of soils prior to shipment off-Site, and treatment of waste water generated from the dewatering.

Comment #8: One commenter wanted to know how the contaminated soils under the building will be treated.

EPA Response #8: Depending on the specifics of the design of the ISTT system, including the locations and spacing of the wells, the same ISTT technology used for the contaminated soils located outside the 200 Stage Road building footprint may be used for the soils under the building. ISTT wells would be drilled either through the building floor or directionally under the building from outside. The mass of contamination under the building represents less than 10% of the contamination on 200 Stage Road. EPA is expecting to treat the entire contaminated area if feasible. The exact extent of the ISTT treatment area will be determined during the design. When ISTT is implemented outside the building footprint only, there is a strong likelihood that through thermal conduction, the VOCs under the building will also be treated.

Comment #9: One commenter wanted to know if the chemicals in the soils will be destroyed, what chemicals will remain and what the removal success rate is for the ISTT process.

EPA Response #9: Through ISTT, the soils will be heated to a very high temperature. As a result, some VOCs will actually be destroyed, and the remaining VOCs will be vaporized. Subsequently, those vapors will be collected and treated. EPA has a history of employing such ISTT treatment options at various Superfund sites. ISTT can remove as much as 99% of the VOC-contamination in the soils.

Comment #10: One commenter wanted to know if the air quality will be affected by the ISTT process.

EPA Response #10: The ISTT is a two-step process. First, the soils are heated to a high temperature. Second, the resulting vapors from the soils being heated are extracted under negative pressure and processed through carbon filters. As a result, EPA expects that there would be little effect on the ambient air conditions, resulting from the ISTT process. There will be continual air monitoring performed during the process operation to detect any fugitive air emissions.

Comment #11: One commenter wanted to know if EPA's cleanup numbers are protective.

EPA response #11: Yes, the RGs are protective to human health and the environment. After the RGs for VOCs are achieved, the treated soils will no longer be a source of VOC-contamination to groundwater by the elimination of the continued cross-media impacts. The RGs established for the excavation of the PCB-contaminated soils will ensure that there is no direct contact threat from PCBs in exposed surface soils under the current and planned future use of the property.

C. CURRENT AND FUTURE CONDITIONS

Comment #12: One commenter wanted to know if Well 1-1 and Well 1-1A are being used for public water supply.

EPA Response #12: Neither well is now used for public water supply. Well 1-1 was abandoned in 1993. Well 1-1A has not been used by the Town of Vestal for water supply since late 1995.

Comment #13: One commenter wanted to know if Area 3 and Area 4, as well as the groundwater being pumped at Well 1-1A, would be cleaned up after the ISTT and the excavation are performed.

EPA Response #13: EPA expects that the ISTT of VOC-contaminated soils in Area 3 and Area 4 and the PCB excavation in Area 3 will achieve the RGs, be cleaned to protective levels and will allow 200 Stage Road to continue to be used for commercial/light industrial activities. EPA expects that the combination of the groundwater treatment remedy and the ISTT for the contaminated soils will allow VOC concentrations in the groundwater plume, which extends from 200 Stage Road to Well 1-1A, to attenuate over time and, ultimately, be reduced to drinking water standards. The monitoring of VOC concentrations in the groundwater will further confirm the removal of source material and provide us with a better understanding of the effectiveness of the soil cleanup.

Comment #14: One commenter wanted to know when the design phase of the project will be performed.

EPA Response #14: The design of the OU2 project is somewhat based on the availability of federal funds. Once EPA has secured those required funds, EPA expects the design to begin in a timely manner. At the present time, EPA expects the design take about one year to complete. Once EPA is ready to proceed with the project design phase, EPA will hold a public availability session for the Vestal community to discuss the next steps in the progress of the project. The subsequent remedial action will also depend on the availability of federal funds.

# Attachment 1

## Proposed Plan

*Superfund Proposed Plan*

U.S. Environmental Protection Agency
Region II

# Vestal Water Supply Well 1-1 Superfund Site
# Town of Vestal, Broome County, New York

**August 2016**

## ◄ MARK YOUR CALENDAR ►

**August 22, 2016 – September 21, 2016:**
The public comment period for this Proposed Plan.

**Public Meeting to Discuss the Proposed Plan**
**Vestal Town Hall**
**Tuesday, August 30, 2016**
**From 7:00 to 9:00 PM**

The **Administrative Record** file contains the documents upon which EPA based its selection of the preferred remedy and is available at the following locations:

Vestal Public Library
320 Vestal Parkway
East Vestal, New York 13850
Phone: (607) 754-4243
*Hours*: Mon: 10:00 am to 9:00 pm
Tues – Thurs: 9:00 am to 9:00 pm
Fri: 9:00 am to 5:00 pm

EPA Region II - Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
Phone: (212) 637-4308
*Hours:* Mon-Fri: 9:00 am to 5:00 pm

EPA's website for the Vestal Water Supply Well 1-1 site: www.epa.gov/superfund/vestal-well-1-1

## EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for amending the remedy selected in the U.S. Environmental Protection Agency's September 27, 1990 Record of Decision (ROD) for Operable Unit Two (OU2) at the Vestal Water Supply Well 1-1 Superfund site (Site). The Proposed Plan identifies the EPA's preferred amendment to the OU2 ROD for the Site and provides the rationale for this preference. This Proposed Plan was developed by the EPA, in consultation with the New York State Department of Environmental Conservation (NYSDEC). The preferred remedial action described in this Proposed Plan addresses human and environmental risks associated with contaminants present in soils in two areas in the Stage Road Industrial Park part of the Site. These areas are identified as Area 3 and Area 4 (described below).

In accordance with Section 117(a) of the Comprehensive Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. § 9617(a), and Section 300.435(c)(2)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.435(c)(2)(ii), if the EPA decides to fundamentally alter a remedy selected in a ROD, the EPA's proposed changes must first be made available for public comment in a proposed plan before the EPA amends the ROD. The EPA is issuing this Proposed Plan as part of its public participation responsibilities under CERCLA Section 117(a) and Sections 300.430(f) and 300.435(c) of the NCP, 40 C.F.R. §§ 300.430(f) and 300.435(c).

The nature and extent of the soil contamination at Areas 3 and 4, the associated human health and ecological risks and the remedial alternatives that are summarized in this Proposed Plan are described in greater detail in the following documents: 1) Conceptual Site Model (CSM) for Non-Aqueous Phase Liquid (NAPL) Sources – June 2015 Final Report (compared to a Remedial Investigation (RI) report), 2) Human Health Risk Assessment Report (HHRA) – December 2015 and 3) the Focused Feasibility Study (FFS) Report (August 2016). The EPA and NYSDEC encourage the public to review these documents, as well as other documents in the OU2 Administrative Record and OU2 Administrative Record Update for the Site, in order to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

This Proposed Plan is being provided as a supplement to the above-noted documents to inform the public of EPA's preferred remedy and to solicit public comments pertaining to all of the soil remedial alternatives evaluated.

In this Proposed Plan, the EPA proposes a change to the original soil cleanup technology which was soil vapor extraction (SVE) for Area 4. The EPA is also including an additional area of soil contamination (Area3). Area 3 is located off the northeast corner of the Site building. Area 4 is located in the parking lots on the south side of the Site building. The SVE system was not effective in treating the soils in Area 4; therefore, the EPA is selecting a new soil remedial technology, in-situ thermal treatment (ISTT), for removing volatile organic compounds (VOCs) in both Areas 3 and 4. In addition, the EPA proposes to excavate and dispose of off-site soils contaminated with recently discovered polychlorinated biphenyls (PCBs) in Area 3.

The EPA is soliciting public comment on all the alternatives considered in both the Proposed Plan and the FFS report.

Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made if public comments and/or additional data indicate that such a change would result in a more appropriate remedial action. The final decision regarding the selected remedy will be made in a ROD Amendment after the EPA has taken into consideration all public comments.

## COMMUNITY ROLE IN SELECTION PROCESS

The EPA relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the CSM, HHRA, FFS reports and this Proposed Plan have been made available to the public for a 30-day public comment period which begins on August 22, 2016. See above for document repositories.

A public meeting will be held during the public comment period on Tuesday, August 30, 2016 to present the findings and conclusions of the CSM, HHRA and FFS reports, to elaborate further on the reasons for recommending the preferred remedy and to receive public comments.

The EPA response to comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary section of the OU2 ROD Amendment which formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

Damian Duda
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telephone: (212) 637-4269
Fax: (212) 637-3966
Email: duda.damian@epa.gov

## SCOPE AND ROLE OF ACTION

Site remediation activities are sometimes segregated into different phases, or operable units (OUs), so that remediation of different aspects of a site can proceed separately, resulting in a more expeditious cleanup of the entire site. This Site is being addressed by the EPA in two OUs. OU2, which is the subject of this Proposed Plan, addresses soil contamination in discrete source areas (Areas 3 and 4) that has resulted in downgradient groundwater contamination. OU1 addresses contaminated groundwater.

With this Proposed Plan, the EPA is modifying the scope and role of the response action identified in the 1990 OU2 ROD, which selected the treatment of soil contamination in Areas 2 and 4 using SVE (no action was deemed necessary for Areas 1 and 3 at that time). Remediation of contaminated soils in Area 2 was successfully completed in November 2000. In 2003, a larger, full-scale SVE system was installed in Area 4. However, after operating the system for several years, it was determined that SVE would not be able to achieve cleanup objectives in portions of Area 4. Additional evaluation of the soils was performed at the Site to further characterize the Area 4 soils to determine what technologies could be used to achieve cleanup objectives in this area; this evaluation also led to the identification of additional contamination in Area 3. As a result, the EPA proposes to change the soil cleanup technology for Area 4 from SVE to ISTT. In addition, the EPA is proposing that Area 3 soils that are contaminated with PCBs be excavated and disposed off-site and that Area 3 soils contaminated with VOCs be treated by ISTT subsequent to the excavation of PCB-contaminated soils.

The primary objectives of this action are to remediate the source contamination (soils) at the Site which continues to affect Site groundwater.

## SITE BACKGROUND

*Site Description*

The Vestal Water Supply Well 1-1 Site is located in the Town of Vestal, southwestern Broome County, New York, approximately 10 miles west of Binghamton, New York and is divided into a western portion and an eastern portion. Several marshy areas and drainage ditches bound the Site to the north, east and south.

The western portion, located between the Susquehanna River and New York State Route 17, includes a wellfield (Well 1-1) is located on Pumphouse Road), a fire department training center, state-owned forest lands and a recreational field is not being addressed in this Proposed Plan. The eastern portion of the Site is the Stage Road Industrial Park which is located approximately 1500 feet southeast of Well 1-1.This study area occupies approximately 5.5 acres (Figure 1). This area is generally flat and lies approximately 1,180 feet south of the Susquehanna River (within the 500-year flood plain).

Four areas located within the Stage Road Industrial Park, identified as Areas 1-4, were originally investigated as potential sources of contamination to Well 1-1 in OU2.

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For the purposes of this Proposed Plan, the EPA is focusing on the 200 Stage Road (Stage Road) location within the larger Stage Road Industrial Park. Stage Road is zoned for commercial/light industry. It is anticipated that Stage Road will continue to be zoned and used for commercial/light industrial activities.

Stage Road includes a 60,000 square foot building that was formerly used to manufacture transformers and, later, electronic circuit boards. The circuit board manufacturing operations ceased in May 2002. From 2007 through 2013, the building was used to recycle electronic equipment. Currently, a portion of the building is being used for light automotive work.

Two Stage Road areas, identified as Area 3 and Area 4 (see Figure 2), are located adjacent to the main building and are considered to be current sources of groundwater contamination and are the subject of this Proposed Plan.

Area 3 is located on the northeast side of the building. Area 4 is located along the entire southern perimeter of the building, primarily within an asphalt-covered parking lot.

*Site History*

In 1979, a chemical spill (or leak) occurred from an underground storage tank at the IBM Endicott facility, located on the north side of the Susquehanna River (approximately one mile north of the Site). In response to the spill, all drinking water supply wells in the area were tested for synthetic organic chemicals. Water samples from Vestal Well 1-1 were found to contain high concentrations of chlorinated VOCs, including trichloroethene or TCE, 1,1,1-trichloroethane or TCA, cis-1,2-dichlorothene or DCE and 1,1-dichloroethane or DCA. However, subsequent investigations determined that the IBM spill was not the source of VOCs found in Well 1-1. In 1986, a remedial investigation/feasibility study (RI/FS), conducted by the NYSDEC, focused on the contamination of groundwater by VOCs in the Vestal Well 1-1 study area. This RI/FS suggested that the source of the VOC contamination in groundwater was located in Stage Road area. A supplemental RI/FS, conducted by the EPA in 1988-89, confirmed that the VOC contamination originated from Stage Road and indicated that releases of VOCs had occurred in several areas there.

Since 1990, when the Vestal Water Supply Well 1-1 was abandoned, the entire impacted area was and continues to be addressed in two OUs. OU1 addresses groundwater contamination through groundwater extraction and treatment (air stripping) of Well 1-1A which was installed subsequent to the abandonment of Well 1-1. The OU1 treatment system has been operational since 1993. OU2 addresses discrete source areas (Areas 1, 2, 3 and 4) of subsurface contaminated soils at Stage Road that resulted in downgradient groundwater contamination.

Since limited soil contamination was found in Areas 1 and 3, no action was deemed necessary. To address contaminated soils in Areas 2 and 4, two separate SVE systems were installed as called for in the 1990 ROD. Remediation of contaminated soils in Area 2 was completed in November 2000.

In 2003, a larger, full-scale SVE system was installed in Area 4. After approximately two years of operation, the EPA conducted soil and groundwater sampling in Area 4 to evaluate the cleanup progress. Soil sampling results showed that high levels of VOCs still remained at two locations that had been treated with the SVE system, *i.e.*, areas beneath a parking lot, just south of the Stage Road building. Because of the fine-grained soils in the saturated zone in Area 4, the soils here was not as conducive to SVE remediation as that in Area 2. As a result, the SVE system would not achieve the cleanup goals identified in the 1990 ROD for all of Area 4.

Subsequently, in January 2006, the Area 4 SVE system was shut down after removing approximately 2,300 pounds of VOCs from the subsurface soils. The EPA's Environmental Response Team (ERT) subsequently conducted additional field investigations which delineated the horizontal and vertical extent of Area 4 contamination, as well as determined that an additional soil contamination source was located in Area 3.

These investigations also revealed that the soil contamination from Areas 3 and 4 extended partially beneath the building and that a different suite of VOCs, as well as PCBs, was found in soils on the northeast side of the building (Area 3). These additional VOCs include DCE, 1,2,4-trimethylbenzene (1,2,4-TMB) and 1,3,5-TMB. These contaminants appeared to have originated from another source than that found on the south side of the building.

Further investigation within Area 4 identified the presence of residual non-aqueous phase liquid (NAPL) within the subsurface. Additionally, one monitoring well in Area 3 (ERT-1S) was found to contain evidence of light non-aqueous phase liquid (LNAPL).

*Site Geology/Hydrogeology*

Within the source areas at the Site, a number of distinct stratigraphic units are known to occur based on examination of records and drilling logs from previous investigations.

The individual geologic units are briefly described below:

Post-Glacial Alluvial Deposits and Fill: Primarily silt and clay with occasional inter-bedded lenses of sand and infrequent gravel. Surficial silty "fill" material occurs from approximately 0 to 5 feet below ground surface (bgs) in most areas of the Site. The average thickness of this layer is approximately 19 feet. The horizontal hydraulic conductivity of these unconfined deposits ranges from approximately 0.04 to 1.4 feet per day.

Upper Glaciofluvial Sand & Gravel Deposits: This is a mixture comprised of sand and gravel. The average thickness beneath the Site is approximately 18.5 feet. The horizontal hydraulic conductivity of these semi-confined deposits ranges from approximately 120 to 380 feet per day.

Glacial Till: An un-stratified mixture of sand, silt, clay, and gravel. The average horizontal hydraulic conductivity of this leaky-confined layer is estimated to be less than 1-foot per day.

Bedrock: The bedrock is comprised of shale and siltstone; the upper 10 to 15 feet is highly weathered and broken. Fractures and bedding planes form a small part of the unweathered rock volume and provide the only significant void spaces in which water can be stored and transmitted. The horizontal hydraulic conductivity of this upper, leaky-confined layer is estimated to range from less than 1 foot per day to approximately 3 feet per day.

Generally, groundwater flows in a west/northwest direction across the Site (toward Vestal Well 1-1). The water table depth at the Site has an average range from approximately 12 to 14 feet bgs.

*Site Characterization and Response*

In 1980, after chlorinated organic solvents were discovered in Well 1-1, the well was taken out of service.

The Site was formally added to the National Priorities List (NPL) on September 8, 1983.

In April, 1985, the NYSDEC began an RI/FS of the Site. The RI/FS and risk assessment were completed in 1986 and confirmed the presence of VOCs in the groundwater southeast and east of Well 1-1 and identified a future risk to residents consuming drinking water contaminated with TCE. The contaminants of concern identified in the risk assessment for the ingestion of groundwater were primarily the VOCs TCE, TCA, DCE and DCA. Based on the RI/FS and the risk assessment, the EPA issued a ROD for OU1 in June 1987 which selected a remedy that addressed the VOCs in the groundwater. The OU1 ROD also recommended that a second RI/FS be undertaken to evaluate suspected source areas of contamination upgradient of Well 1-1.

In November 1988, the EPA conducted an RI/FS for OU2. The EPA investigated four areas of concern in Stage Road (Areas 1-4, as shown on Figure 1). The results of the RI/FS revealed significant VOC contamination in subsurface soils located in Areas 2 and 4 and limited soil contamination in Area 1 and Area 3. Most of the subsurface contamination was determined to reside between five and 25 feet below ground surface with the highest VOC concentrations at depths greater than 10 feet.

The original OU2 risk assessment identified unacceptable risks to future construction workers exposed through ingestion and dermal contact with the contaminated soils and inhalation of VOCs in Areas 2 and 4. In addition, the risk assessment identified unacceptable risk to residents within the entire Site area from the ingestion of groundwater contaminants which were leached from the soils. Potential exposure pathways considered were ingestion of groundwater from directly below source Area 2 and Area 4 and from Well 1-1. VOCs, including TCE, TCA, DCE, DCA and tetrachloroethene or PCE were identified as contributing to the health risks to construction workers and to residents.

The OU2 ecological risk assessment determined that it is unlikely that the soil and groundwater contamination in the study area has adversely affected any plant life in the study area, particularly wetlands, as a result of the considerable depths at which the higher concentrations of contaminants have been detected (*i.e.*, below root levels). As a result, EPA considered the study area to have limited ecological significance to both flora and fauna. Based on the RI/FS and risk assessment, the EPA signed a ROD for OU2 on September 27, 1990 which addressed the contaminated soils located in the two discrete source areas, Area 2 and Area 4.

The EPA performed the remedial design/remedial action (RD/RA) for OU1 and for Area 2 of OU2 because no viable potentially responsible parties were identified. In March 1991, the EPA issued a unilateral administrative order (UAO) to three potentially responsible parties for the performance of the RD/RA at Area 4. Two of the potentially responsible parties (PRPs) initially complied with the order; however, subsequently they indicated that financial constraints would prevent their full compliance the UAO. The EPA, therefore, assumed performance of the remaining work. In May 1999, the EPA completed a settlement with the PRPs that provided for the payment of $775,000 towards the EPA's costs of performing the Area 4 RA.

<u>OU1</u>

In May 1989, the EPA began construction of the air stripping facility which was completed in July 1990. In December 1993, as a result of poor performance of an aged Well 1-1, Well 1-1 was abandoned and a new well, Well 1-1A, was installed with a maximum pumping capacity of 1150 gallons per minute (gpm), averaging 300 to 500 gpm.

In March 1995, the EPA issued a RA Report which determined that Well 1-1A and the associated air stripping facility were fully operational and functional as a potable water supply. In May 1995, the Town of Vestal indicated that it no longer required the water from Well 1-1A for its drinking water supply. As a result, the EPA performed the first 10 years of the long term response action to treat the extracted groundwater and discharged the treated water from Well 1-1A to the Susquehanna River.

In 2006, NYSDEC assumed responsibility for the operation and maintenance (O&M) of the groundwater extraction and treatment facility for Well 1-1A. In 2014, NYSDEC performed a remedy system optimization (RSO) for the groundwater remedy in order to evaluate the current OU1 remedy. Even though the treatment system was effective in treating the contaminated groundwater down to maximum contaminant levels (MCLs), the groundwater concentrations within the aquifer were not being reduced. This indicated that a continuing source of groundwater contamination was still present, *i.e.*, contaminated soils. The RSO determined that continued operation of the treatment facility was no longer necessary to protect the operating Vestal public water supply wells from the groundwater plume. Vestal current public water supply wells (Vestal 1-2A and 1-3) are approximately 1500 feet west of the treatment facility and are both fitted with treatment units. As a result, NYSDEC decided to shut down the facility but continue monitoring the groundwater plume which continues to show VOC concentrations above maximum contaminant levels (MCLs).

In 2014, NYSDEC performed a remedy system optimization for the groundwater remedy. As a result, the current OU1 remedy was found to be not effective in remediating the groundwater and that its operation was no longer necessary to protect Vestal's water supply. As a result, NYSDEC decided to shut down the facility but continue monitoring the groundwater plume which continued to show VOC concentrations above maximum contaminant levels (MCLs). Subsequently, NYSDEC requested that the EPA investigate the apparent continuing source (soils) of groundwater contamination.

<u>OU2</u>

In January 1997, as per the OU2 1990 ROD remedy, the SVE system, designed to remove VOCs from the unsaturated soils, began operation in Area 2. In December 1997, four additional vertical SVE wells were installed to extend the treated area to the contaminated soils in the eastern portion of Area 2. In November 2000, the SVE was terminated in Area 2 as a result of successfully achieving the ROD soil cleanup levels.

During September and October 2001, soil sampling was performed in Area 4 to delineate further the area of contamination. In June 2003, the SVE system, similar to that in Area 2, began operating in Area 4. In February, September and October 2005, as a result of low VOC contaminant removal rates, the EPA conducted soil and groundwater sampling at the Site to evaluate the progress of the SVE system in cleaning-up Area 4. The results of the sampling showed that very high levels of VOCs still remained in the deep unsaturated and shallow saturated zones. In January 2006, the SVE system was temporarily shut down in order to determine if the modifications to the SVE system could achieve OU2 soil cleanup levels.

Based on the results of this evaluation, the EPA determined that, without enhancement, the SVE system in Area 4 would be unable to address the remaining VOC contamination in the fine-textured soils at the Site.

In order to evaluate alternatives methods of remediating the soils in Area 4 as well as identify additional areas of contamination at the Site, the EPA conducted further soil and groundwater sampling to delineate fully the horizontal and vertical extent of VOC contamination remaining at the Site and to evaluate the subsurface geology/hydrology.

During August and September 2006, 56 soil borings were drilled at the Site as an initial effort for defining the extent of subsurface contamination. A total of 133 soil samples was collected for VOC analyses.

In November and December 2007, an additional 54 soil borings were drilled at the Site to define the horizontal and vertical extents of subsurface contamination. A total of 153 soil samples were collected for analysis of VOCs.

During May and June 2008, four monitoring well clusters (ERT-1 through ERT-4) were installed at the Site to assess concentrations of VOCs in groundwater with depth. In July 2008, as part of this field effort, nine soil borings, all 20 feet in depth, were drilled around the northeast corner of the Site building to investigate the extent of subsurface contamination within this area, based on initial detections in previous borings. A total of 39 soil samples were collected from the nine borings for analysis of VOCs.

During this time, LNAPL was detected in well ERT-1S. A groundwater sample from this well indicated the presence of VOCs and petroleum hydrocarbons.

In March 2009, eight additional soil borings were drilled around the northeast corner of the Site building (Area 3) to characterize further the nature and extent of subsurface VOC contamination. A total of 27 soil samples were collected for analysis of VOCs.
During June and July 2009, five 1.5-inch diameter PVC monitoring wells were installed around the northeast corner of the Site building to define the extent of LNAPL source contamination within this area. Three deep 2-inch diameter PVC monitoring wells were additionally installed during this investigation to assess VOC concentrations in groundwater within the weathered bedrock beneath the Site. A total of 20 soil samples were collected from the borings associated with the deep wells for analysis of VOCs and PCBs.
In May 2010, four 2-inch stainless steel monitoring wells were installed on the northeast side of the building (near well ERT-1S) to delineate the horizontal extent of the LNAPL within this area. One additional 2-inch PVC monitoring well was installed along the northwest side of the building to monitor groundwater quality within deeper strata, *i.e.*, lower glacial till and upper weathered bedrock.

In December 2012, over 250 soil samples were collected from 44 borings to characterize the horizontal and vertical extents of additional contaminants of concern at the Site; namely, PCBs and semi-volatile organic compounds (SVOCs). A total of 13 surface samples (between 0 and 1-foot depth) were additionally collected at 13 borehole locations for analysis of VOCs. The results of this investigation, along with previously acquired data, were used to support the human health risk assessment for the Site.

In July 2013, nine directional or horizontal borings were drilled beneath the northeast corner of the building to assess the horizontal and vertical extents of contamination in subsurface deposits. A total of 18 subsurface samples was collected for analysis of VOC, SVOCs and PCBs. The results of the soil sampling revealed that the TCA and TCE were the most prevalent contaminants, exhibited the highest concentrations and are expected to be the primary focus of the VOC soil cleanup. These VOC concentrations were detected in the 10-to-20 foot depth range where fine-textured soils and the capillary fringe of the aquifer exist. The VOCs were detected in two areas of the parking lot, located on the south side of the building, underneath the building and in the northeast corner of the Site.

**RESULTS OF THE REMEDIAL INVESTIGATION**

The evaluation of the nature and extent of contamination focuses on Site-related contaminants that were identified during previous and recent investigations.

The primary contaminants of concern (COCs) at the Site include the following:

- 1,1,1-TCA
- TCE
- cis-1,2-DCE
- 1,2,4-TMB
- 1,3,5-TMB
- PCBs

The selection of the above contaminants as primary COCs is based on 1) frequency of detection, 2) wide-spread occurrence in soils, 3) higher concentrations relative to other contaminants found at the Site and 4) need for remediation. Additionally, based on their overall physical properties, the above contaminants (excluding PCBs) are considered to be representative of other VOCs detected at the Site.

The characterization of Site conditions emphasizes the spatial distribution of contaminants in Site soils (*i.e.*, unconsolidated deposits) based on approximately 640 samples collected from 180 borings that were advanced up to 30 feet bgs. Analytical results indicate that VOCs are ubiquitous in Areas 3 and 4.

Figure 2 illustrates the lateral extent of the primary COCs at Stage Road. Most of the contamination resides between five and 25 feet bgs. Around the northeast corner of the building, most of the contamination is between five and 20 feet bgs.

The highest level of contamination detected in the Area 4 parking lot for TCA was 23,600 milligrams per kilogram (mg/kg) or parts per million (ppm) at approximately 17.5 feet bgs and for TCE was 13,000 mg/kg or ppm at approximately 16.5 feet bgs. These high concentrations indicate the presence of dense non-aqueous phase liquid (DNAPL).

This VOC contamination appears to be limited to 1) an area approximately 20 feet long by less than 10 feet wide in the eastern area of the parking lot and 2) an area approximately 25 feet by 20 feet in the western area of the parking lot. Lower levels of VOCs were also detected beneath the building, up to 83 mg/kg TCA and 108 mg/kg TCE.

In the northeast corner of the Site (Area 3), the highest concentration found for TCA, TCE and 1,2,4-TMB were 5.9 mg/kg, 244 mg/kg and 107 mg/kg, respectively. The highest concentration of other COCs (DCE, 1,3,5-TMB and 1,2,4-TMB) detected in unconsolidated deposits around the northeast corner of the building (Area 3) are as follows:

- DCE – 19.6 mg/kg, average depth at around 19 feet
- 1,3,5-TMB – 45.9 mg/kg, detected at around 6.9 feet
- 1,2,4-TMB – 107 mg/kg, detected at around 9.5 feet

The presence of TMBs around the northeast corner of the building suggests they originated from a different source, as compared to the two source areas in the parking lot on the south side of the building (Area 4).

In Area 3, the depths of PCB soil samples ranged from approximately five to 20 feet with concentrations ranging from 0.13 to 31.4 mg/kg. In Area 3, total PCBs sampled below one foot only exceeded 10 mg/kg in in one samples. Also, low concentrations of PCBs, up to 8.5 micrograms per liter (μg/L), were detected in groundwater from two monitor wells within this area (MW-F and MW-I).

Because PCBs are known to be present in the LNAPL in Area 3, their extent would essentially be limited to the extent of the LNAPL (approximately 110 cubic yards). In Area 4, approximately 120 cubic yards of DNAPL, contained in the soils, is located in the western parking lot area and approximately 160 cubic yards of DNAPL, contained in the soils, is located in the eastern parking lot area. The presence of PCBs is believed to result from their association with NAPLs that were previously released to (or spilled onto) the ground surface. Other chemicals or compounds in the NAPLs could have increased the mobility of PCBs (through co-solvency), which caused them to vertically migrate through the shallow unconsolidated deposits. As part of this investigation, the EPA and ERT developed the FFS to identify remedial alternatives for cleaning up the contaminated soils located in Areas 3 and 4.

Also, in order to be protective, the EPA currently performs biennial subslab and indoor air sampling at the Stage Road building.

## PRINCIPAL THREAT WASTES

**What is a "Principal Threat"?**

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

As an ongoing source of groundwater contamination, approximately 28,000 cubic yards of VOC-contaminated soils and 730 cubic yards of PCB-contaminated soils would be considered principal threat wastes.

## RISK SUMMARY

The purpose of the risk assessment is to identify potential cancer risks and noncancer health hazards at the Site assuming no further remedial action and in the absence of institutional controls to prevent exposures. A baseline HHRA was developed to evaluate potential exposures to soils in Area 3 and 4 in order to assess current and future cancer risks and noncancer health hazards, based on the data results of the CSM.

A screening-level ecological risk assessment (SLERA) was also conducted to assess the risk posed to ecological receptors as a result of Site-related contamination.

### Human Health Risk Assessment

EPA conducted a baseline HHRA in order to estimate the cancer risks and non-cancer hazards associated with the current and future effects of contaminants on human health and the environment. A baseline HHRA is an analysis of the potential adverse human health effects caused by hazardous-substance exposure in the absence of any actions to control or to mitigate such exposure under current and future land uses. The EPA's evaluation of potential exposure during the development of a risk assessment uses the term Chemicals of Potential Concern or COPCs.

### Site Description

The baseline HHRA for the Site focused on Stage Road, which is zoned for commercial-light industry use. The property is expected to continue to be zoned for commercial/light industrial use. Stage Road consists of a large one-story building, with an area covering approximately 60,000 square feet, an adjacent parking lot and surrounding open space. Based on its small area, the Stage Road property was addressed as a single exposure unit (EU). The building was used to manufacture transformers and later electronic circuit boards. The circuit board manufacturing operations ceased in May 2002. From 2007 through 2013, the building was used to recycle electronic equipment and is currently being used for storage and automotive accessory installations.

Numerous studies have documented the presence of VOCs in surface and subsurface soils at this Site; (SVOCs) and (PCBs) were also identified as being present. Future residents, although unlikely, as well as current and future outdoor workers or trespassers may be exposed to surface soils (*e.g.*, depths of zero to one foot) at the Site through incidental ingestion, dermal contact, and/or inhalation. Construction workers may be exposed to both surface and subsurface soils (from zero to 10 feet) at the Site through incidental ingestion, dermal contact and/or inhalation of COPCs in soils Exposure to groundwater through consumption of tap water was not evaluated in this BHHRA since it was previously addressed in the 1986 OU1 ROD.

**WHAT IS RISK AND HOW IS IT CALCULATED?**

**Human Health Risk Assessment:** A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

*Hazard Identification*: In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

*Exposure Assessment*: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

*Toxicity Assessment*: In this step, the types of adverse health effects associated with chemical exposures and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

*Risk Characterization*: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a $10^{-4}$ cancer risk means a "one in ten thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of $10^{-4}$ to $10^{-6}$, corresponding to a one in ten thousand to a one in a million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is $10^{-6}$ for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a $10^{-4}$ cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final Record of Decision.

**Risk Assessment Process**

A four-step human health risk assessment process was used for assessing site-related cancer risks and non-cancer health hazards. The four-step process is comprised of: Hazard Identification of Chemicals of Potential Concern (COPCs), Exposure Assessment, Toxicity Assessment, and Risk Characterization. For further information, please see the previous box: <u>What is Risk and How is it Calculated?</u>.

The baseline HHRA began with selecting COPCs in surface and subsurface soils that could potentially cause adverse health effects in exposed individuals.

**Exposures**

The primary receptors of concern at the Site are as follows: 1) under current conditions, outdoor workers and teenage trespassers and 2) under future conditions: residents and construction workers.

Exposed individuals and potential receptor pathways are listed below.

- Outdoor Worker: Adults (18 years and older) who may be exposed through current and future ingestion, dermal contact and inhalation of surface soils (depth of zero to 1 foot) surrounding the building.
- Teenage Trespasser: Adolescents (ages 7 to 18 years) who may be exposed under current and future land use conditions through ingestion and dermal contact with surface soils.
- Residents. Resident (adult older than 18 years) /child (6 years and younger)) who may be exposed through future ingestion and dermal contact with surface soils (zero to 1 feet in depth) and to VOCs in indoor air off-gassing from surface soils or subsurface soils excavated to the surface and not managed consistent with a Site Management Plan for contaminated soils.
- Construction Worker: Adult (18 years and older) who may be exposed in the future through the ingestion, dermal contact and inhalation of surface and subsurface soils (zero to 10 feet in depth).

In this assessment, exposure point concentrations were estimated using either the maximum detected concentration of a contaminant or the 95% upper-confidence limit (UCL) of the average concentration. Chronic daily intakes were calculated based on the reasonable maximum exposure (RME), which is the highest exposure reasonably anticipated to occur at the Site. The RME is intended to estimate a conservative exposure scenario that is still within the range of possible exposures.

Central tendency exposure (CTE) assumptions, which represent typical average exposures, were also developed. A complete summary of all exposure scenarios can be found in the BHHRA that is part of the Administrative Record.

**Toxicity Assessment**

Toxicity information that was obtained is consistent with the Superfund Toxicity Hierarchy (USEPA 2003).

**Risk Characterization**

<u>Surface and Subsurface Soils</u>

Risks and hazards were evaluated for the potential current and future exposure to surface and subsurface soils. The populations of interest included outdoor workers, future residential adults and children and future construction workers. The cancer risks were below or within the EPA acceptable ranges for all receptors. The non-cancer hazards exceeded the goal of protection of an HI = 1 for the construction worker with an HI = 2 from exposure to PCBs in surface and subsurface soils. Therefore PCBs were identified as a COPC for the surface or subsurface soils (see Table 1 below).

The risks and hazards associated with soil exposure to all receptors, with the exception of exposures to the construction worker, were within the risk range and below an HI = 1. As a result, there is a need to address the soils through a remedial action for this exposure. A complete discussion of the risks and hazards can be found in the baseline HHRA in the Site repository.

<u>Impact to Groundwater</u>

The risks and hazards associated with soil exposure in to all receptors, with the exception of exposures to the construction worker in Area 3, were within the risk range and below an HI = 1. The OU1 and OU2 RODs addressed groundwater contamination. The soil concentrations in the EU are above the concentrations that are associated with an adverse impact to groundwater; thus, there is a need to address the soil contamination to protect the groundwater resource.

A complete discussion of the risks and hazards can be found in the baseline HRRA.

**Table 1.** Summary of Hazards and Risks Associated with Surface and Subsurface Soil at Vestal 1-1

| Receptor | Hazard Index | Cancer Risk |
|---|---|---|
| *Surface Soils* | | |
| Outdoor Worker - adult (current) | 0.2 | $9x10^{-7}$ |
| Trespasser - adolescent (current / future) | 0.02 | $4x10^{-7}$ |
| Residential - adult/child (future) | 0.05 A<br>0.2 C | $1.1 x10^{-5}$ |
| *Surface/Subsurface Soils* | | |
| Construction Worker – adult (future) | 2.0 | $2x10^{-5}$ |

## Ecological Risk Assessment

The OU2 ROD indicated that study area was determined to have limited ecological significance to both flora and fauna. The ecological assessment for the Site addressed the potential impact on ecological receptors of soil contamination. Although elevated concentrations of volatile and semi-volatile organic compounds (VOCs and SVOCs) at the Site were detected at considerable depths (*i.e.,* well below root levels), EPA requested that a focused screening level ecological risk assessment (SLERA) be conducted to evaluate potential ecological risk posed by surface soil contamination.

Surface soil concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. Food chain modeling using various exposure scenarios was also utilized to assess potential risks to upper trophic level receptors (vermivores). A complete summary of all exposure scenarios can be found in the SLERA.

Based on food chain calculations conducted in the SLERA, there is a potential risk to vermivorous birds using conservative exposure parameters for PCBs. Risk from exposure to PCBs were calculated for vermivorous mammals also using conservative parameters. Additionally, the comparison of COPC concentrations in surface soils with ecological soil screening values indicates a potential for ecological risk from several polycyclic aromatic hydrocarbons (PAHs) including anthracene, fluoranthene, naphthalene, phenanthrene and pyrene. Although PAHs are not identified as primary COCs for the Site, these will be addressed during remedial action.

### Conclusion

Based upon the results of the CSM and the risk assessments, EPA has determined that actual or threatened releases of hazardous substances from the Site may present a current or potential threat to human health and the environment if they are not addressed by the preferred alternative or one of the other active measures considered.

## REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are based on available information and standards, such as applicable relevant and appropriate requirements (ARARs) and to-be-considered guidances (TBCs).

The specific RAOs identified for the Site in the 1990 OU2 ROD were as follows:

- Ensure protection of groundwater from the continued release of VOC contamination from soils.
- Ensure protection of Vestal Well 1-1 water quality from any groundwater contamination not addressed in the first operable unit.
- Ensure protection of human health, presumably that of site workers who are exposed to contaminated soils through excavation.

Note that first and third RAOs identified above are applicable to the soils being addressed in this Proposed Plan. The second RAO was intended to ensure that if the potential existed for Well 1-1 to be impacted by metals contamination, appropriate measures would be taken; monitoring subsequent to the issuance of the 1990 ROD, confirmed the EPA's belief that Well 1-1 would not be impacted by metals contamination.

The revised RAOs for OU2 are as follows:

- Prevent and or minimize human and ecological exposures, including ingestion, inhalation and dermal contact to the contaminants present in soils.
- Ensure protection of construction workers who could be exposed to contaminated soils through excavation.
- Ensure protection of groundwater from the continued release of VOCs from soils.

As part of the evaluation of remedial alternatives in the FFS, primary and secondary preliminary remediation goals (PRGs) were included as part of each remedial alternative for contaminated soils. These PRGs were based on NYS Part 375 soil cleanup objectives (SCOs) and NYS CP-51 soil cleanup guidance. The primary PRGs are SCOs identified for protection of public health under the "restricted commercial land use" SCO category. The secondary PRGs are SCOs identified for the protection of groundwater under the "restricted use" SCO category.

In this Proposed Plan, the PRGs for the VOC-contaminated soils ensure the protection of groundwater. The PRGs for the PCB-contaminated soils ensure the NYS presumptive remedy is achieved.

**Table 2.** The PRGs for the Site and this Proposed Plan

| Contaminants of Concern (COCs) | Preliminary Remediation Goals (mg/kg) |
|---|---|
| 1,1,1-Trichloroethane (TCA) | 0.68 |
| Trichloroethene (TCE) | 0.47 |
| cis-1,2-Dichloroethene (DCE) | 0.25 |
| 1,2,4-Trimethylbenzene (1,2,4-TMB) | 3.6 |
| 1,3,5-Trimethylbenzene (1,3,5-TMB) | 8.4 |
| Total PCBs (0 to 1 foot) | 1.0 |
| Total PCBs (greater than 1 foot) | 10.0 |

## SUMMARY OF REMEDIAL ALTERNATIVES

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

With respect to the areas to be remediated, as shown on Figure 2, Area 3 is divided into two locations: Area 3 is outside of the building and Area 3B is under the building. Area 4 is divided into three locations: Area 4-1 is the western parking lot area, Area 4-2 is the eastern parking lot area and Area 4-2B is under the building.

**Table 3.** Distribution of COCs, Based on the PRGs

| Areas | Primary COCs | Impacted Area ($ft^2$) | Impacted Soil Volume ($yd^3$) | Contaminant Mass (kg) |
|---|---|---|---|---|
| Area 4-1<br>Depth:<br>5-25 ft. | TCA<br>TCE | 8,457 | 6,264 | 874 |
| Area 4-2<br>Depth:<br>5-25 ft. | TCA<br>TCE | 9,419 | 6,977 | 715 |
| Area 4-2B<br>Depth :<br>5-25 ft. | TCA<br>TCE | 9,010 | 6,674 | 17 |
| Area 3<br>Depth:<br>5-20 ft. | 1,2,4-TMB<br>TCE<br>TCA | 12,839 | 6403 | ≤ 125 |
| Area 3<br>Depth:<br>5-10 ft. | PCBs | 1,517 | 730 | ≤ 10 |
| Area 3B<br>Depth:<br>5-20 ft. | TCE<br>DCE | 1,984 | 1,102 | < 1 |

Common Elements

Each soil remedial alternative has common elements which will be included as part of each soil remedial alternative. With the exception of five-year site reviews, the common elements listed below do not apply to the No Action alternatives. The common elements include the following:

Institutional Controls (ICs): A governmental IC in the form of the commercial/light industrial zoning that is currently in place would be relied upon as an IC until the preferred remedial alternative is fully implemented and allows for unrestricted use/unlimited exposure. The original 1990 OU2 ROD did not include ICs as part of the selected remedy.

Five-Year Site Reviews: As per CERCLA, alternatives resulting in contaminants remaining above levels, which allow for unrestricted use and unlimited exposure, require that the Site be reviewed at least once every five years. If justified by the review, additional remedial actions may be implemented to remove, to treat or to contain the contaminated soils.

### Alternative #1: No Action

| | |
|---|---|
| Capital Cost | $0 |
| Annual OM&M | $0 |
| Construction Time | N/A |

A "no action" alternative is required by the NCP to provide an environmental baseline against which impacts of the various remedial alternatives can be compared. Under this alternative, no further action would be taken to remedy the contaminated soils or to monitor contaminant concentrations to address the associated risks to human health or the environment. Because this alternative would result in contaminants remaining on-site above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, remedial actions may be implemented to remove or treat the wastes.

**Alternative R2: Excavation and Off-site Disposal**

| | |
|---|---|
| Capital Cost | $39,223,160 |
| Present Worth | $39,223,160 |
| Annual OM&M | $0 |
| Construction Time | ~12 months |

Under this alternative, contaminated soils in the source areas (Areas 3 and 4) outside the Site building footprint would be excavated and transported off-site for disposal at a Resource Conservation and Recovery Act (RCRA) permitted Subtitle C or D landfill based on results of Toxicity Characteristic Leaching Procedure (TCLP) testing. All excavated areas would be backfilled with clean soils. Based on the extent of source areas shown in Figure 2, in order to achieve the PRGs for VOCs, approximately 32,000 cubic yards would need to be excavated and transported off-site from Areas 3 and 4; in order to achieve the PRGs for PCBs, approximately 730 cubic yards of soils would need to be excavated from Area 3 only.

With the exception of PCBs around the northeast corner of the building, most of the contaminated areas are fairly well defined. It is, therefore, assumed that a pre-design investigation would only be necessary around the northeast corner of the building, prior to excavation, in order to delineate the volume of PCBs in the subsurface.

Post-excavation samples in Area 3 would additionally be collected to verify that the PRGs are achieved. Excavated material would be loaded into dump trucks and transported to a RCRA Subtitle C or D landfill for disposal, as applicable. If post excavation sampling shows that some contaminated soils are above 50 mg/kg PCBs, then this soils would need to comply with the disposal requirements of the Toxic Substance Control Act. For purposes of costing, it is assumed that 50% of the soils would require disposal at a Subtitle C landfill as a result of the high VOC concentrations in some areas beneath the Stage Road property.

In summary, excavation and off-site disposal would include (but not be limited to) the following:

- Decommissioning of existing monitoring wells (those within and around the excavation footprints).
- Installation (and removal) of sheet piling and associated tie-backs.
- Excavation dewatering.
- On-site treatment of contaminated groundwater that is collected as part of any necessary dewatering operations and subsequent discharge to a publicly-owned treatment works or other permitted outfall.
- Excavation and removal of contaminated soils.
- Trucking and off-site disposal of contaminated soils, along with any ex situ pre-treatment (e.g. chemical oxidation, incineration), if required, and
- Backfilling excavations with clean fill - along with asphalt paving, topsoil, seeding, etc.

**Alternative R3: In situ Thermal Treatment and Excavation and Off-site Disposal[1]**

| | |
|---|---|
| Capital Cost | $14,500,000 |
| Present Worth | $14,500,000 |
| Annual O&M | $0 |
| Construction Time | 11-14 months |

Under this alternative, soil contamination would be addressed by ISTT and limited excavation and disposal. For the purposes of evaluation, comparison and costing, Thermal Conductive Heating (TCH) and Steam Enhanced Extraction (SEE) were used as the representative thermal technologies. However, Electrical Resistance Heating (ERH) or some combination of three processes may be considered during the RD phase. TCH can achieve very high contaminant removal efficiency in soils and SEE overcomes heat losses in soils where groundwater flow is greater than one foot per day, *i.e.*, sand & gravel deposits.

The conceptual ISTT approach includes:

- Installation of TCH heater wells (at a spacing of approximately 15 feet) with area-specific treatment temperatures;
- Application of steam to the sand & gravel (beneath the overlying alluvial deposits) to control heating;

[1] *Note: The FFS described Alternative R3 as In Situ Thermal Treatment for the VOC-contaminated soils. This Proposed Plan now defines Alternative R3) as ISTT for the VOC-contaminated soils and the excavation and off-site disposal of the PCB-contaminated soils (as indicated in Alternative R2).*

- Extraction of soil vapor and steam from centroid multiphase extraction (MPE) wells and SVE wells to capture vaporized contaminants;
- Treatment of extracted liquid (condensate) and vapor using granular activated carbon (GAC), and monitoring for mass removal and discharge compliance; and
- Monitoring of temperature and pressure to track subsurface heating, pneumatic, and hydraulic control.

Since there is a potential for significant groundwater flow within the subsurface remediation areas, which would adversely affect an ISTT remedy, it may be necessary to install sheet piling prior to any thermal treatment in order to reduce such groundwater flow in the more transmissive zones of the subsurface environment.

If the treatment beneath the building is considered necessary in order to achieve the PRGs, the installation of treatment wells beneath the building will be further evaluated during the RD. Hence, under the building only, all well types would either be installed either at an angle or horizontally (via directional drilling) in order to reach the treatment areas.

To achieve the PRGs for VOCs, approximately 28,000 cubic yards of soils would need to be treated within the areas 3 and 4, as shown in Figure 2.

To achieve the PRGs for PCBs in Area 3, approximately 730 cubic yards of contaminated soils would be excavated down to 10 feet bgs. The excavated soils would then be transported off-site for disposal at a RCRA permitted Subtitle C or D landfill. To achieve the PRGs for VOCs, ISTT would be used to address the remaining targeted treatment zone in Area 3 subsequent to backfilling of clean soils in the excavation area for PCBs.

Because the Site geology is well-defined and the thermal technologies are well-proven, it is assumed that pre-design treatability testing (*i.e.*, pilot studies) would not be required prior to the implementation of the full-scale ISTT at the Site. It is also assumed that a pre-design sampling investigation would be necessary around the northeast corner of the building (Area 3) to define further the nature and extent of PCBs in the subsurface. Subsequent to the ISTT, post-remediation soil samples would be collected to verify that the RGs are achieved.

## COMPARATIVE ANALYSIS OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria: overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance. These criteria are explained below.

The first two criteria above (overall protection of human health and the environment and compliance with ARARs) are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy. The next five Superfund criteria (long-term protectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability and cost) are known as "primary balancing criteria" and are factors with which tradeoffs between response measures are assessed so that the best option will be chosen, given site-specific data and conditions. The final two evaluation criteria (state acceptance and community acceptance) are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may cause the EPA to modify the preferred response measure or cause another response measure to be considered.

Overall Protection of Human Health and the Environment

Alternative R1 would not protect human health and the environment. Alternatives R2 and R3 would provide overall protection to human health and the environment. For Alternative R2, human health risk would be eliminated through removal of contaminated soils. Contaminated land could be restored to beneficial use, and groundwater quality would be protected by treatment or removal of the contaminated soils to meet the PRGs. Alternative R3 eliminates human health risk by reducing the mass of contamination in both subsurface soils and groundwater in the source areas. Alternative R1 would not meet the RAOs. Alternatives R2 and R3 would meet the RAOs.

Compliance with ARARs

The EPA has identified New York State's soil cleanup objectives (SCOs) for protection of groundwater (6 NYCRR Part 375-6) as ARARs, TBCs or other guidelines to address contaminated soils in Areas 3 and 4. Alternative R1 would not comply with the SCOs because no action would be taken. Alternatives R2 and R3 would comply with the SCOs through contaminated soil removal and off-site disposal and contaminant mass removal of COCs via ISTT. Action-specific and location-specific ARARs are not applicable to Alternative R1, since no action would be taken. Alternatives R2 and R3 would comply with action-specific ARARs by implementing health and safety measures during the remedial action and (for R2) by meeting transportation and disposal requirements for excavated soils. Alternatives R2 and R3 would also comply with location-specific ARARs.

**NINE EVALUATION CRITERIA FOR REMEDIAL ALTERNARTIVES**

- Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks posed through each exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls or institutional controls.
- Compliance with ARARs addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes, regulations and other requirements or provide grounds for invoking a waiver.
- Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.
- Reduction of toxicity, mobility, or volume through treatment is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.
- Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.
- Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
- Cost includes estimated capital costs, operation and maintenance costs and net present worth costs.
- State acceptance indicates if, based on its review of the RI/FS and Proposed Plan, the State concurs with the preferred remedy.
- Community acceptance will be assessed in the ROD and refers to the public's general response to the alternatives described in the Proposed Plan and the RI/FS reports.

Long-Term Effectiveness and Permanence

Alternative R1 is not considered a permanent remedy since no action would be taken. Alternatives R2 and R3 would achieve long-term effectiveness through the removal of contaminated soils through excavation and off-site disposal and through contaminated mass removal though ISTT, resulting in unrestricted land use.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative R1 would not reduce toxicity, mobility, or volume through treatment since no treatment would be implemented. Alternative R2 would reduce the volume of on-Site contaminated soils through excavation and removal. Alternative R3 would provide the greatest level of reduction of toxicity, mobility and volume through ISTT.

Short-Term Effectiveness

Alternative R1 would not have any short-term impact since no action would be taken. Alternative R2 would have some impact to the surrounding areas during excavation activities. Alternative R2 and R3 would also result in short-term risk to Site workers and the local community during system construction. Alternatives R2 and R3 would generate noise and impact traffic as a result of heavy construction equipment. These would need to be mitigated through Site control and traffic control measures. Alternatives R2 and R3 also may temporarily increase particulate emissions. Dust control would need to be implemented through the use of dust suppression techniques (*e.g.*, water or foam sprays) to minimize impact to the workers and the local community. Storm water runoff would need to be controlled through the use of conventional, temporary storm water/erosion control features (e.g., berms, ditches, or silt fences). In addition, air monitoring would be required to reduce risks to workers and the local community from fugitive emissions during on-Site activities. Potential risks to workers associated with direct contact with contaminated material would be mitigated through the use of personal protective equipment (PPE) and standard health and safety practices. Alternative R2 would have the biggest impact to the local community since it would involve heavy traffic on local roadways (during Site transportation of contaminated soils and transportation of clean fill to the Site). Truck traffic needed for the R3 PCB excavation and the thermal treatment equipment also would impact local roadways but to a significantly lesser degree than R2.

Implementability

Alternative R1 would be the easiest to implement since it involves no action. Alternative R2 would use conventional construction equipment and is technically implementable. Alternative R3 is technically and administratively implementable although a limited number of vendors will be able to provide the technology. While permits are not required for on-site activities at Superfund sites, the technical requirements contained within the permits (regarding air emissions, installation of wells, piping, and related remediation system equipment) would be met. The estimated time frame for the construction and implementation of Alternatives R2 and R3 is approximately one year.

Cost

Alternative R1 would not involve any costs. The capital costs associated with Alternative R2 are approximately $39.2 million for the excavation and off-site disposal of contaminated soils. The capital costs associated with Alternative R3 are $14.5 million if contamination beneath the building is addressed. There are no O&M costs associated with any of the alternatives.

**Table 4.** Cost Estimates for the Three Alternatives

| Alternatives | Capital Cost | Annual O&M Costs | Total Present Worth Cost |
|---|---|---|---|
| RI | $0 | $0 | $0 |
| R2 | $39,223,160 | $0 | $39,223,160 |
| R3 | $14,500,000 | $0 | $14,500,000 |

State/Support Agency Acceptance

NYSDEC concurs with the preferred alternative for the Site.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends, and this evaluation will be further detailed in a Responsiveness Summary for the OU2 ROD Amendment.

**PREFERRED REMEDY**

Based on an evaluation of the three remedial alternatives, the EPA and NYSDEC recommend Alternative R3 – In situ Thermal Treatment for VOCs and Excavation and Off-Site Disposal for PCBs along with the common elements noted above.

Under this alternative, soil contamination would be addressed by ISTT. The conceptual ISTT approach includes:

- Installation of TCH heater wells  with area-specific treatment temperatures;
- Application of steam to the sand & gravel (beneath the overlying alluvial deposits) to control heating;
- Extraction of soil vapor and steam from centroid MPE wells and SVE wells to capture vaporized contaminants;
- Treatment of extracted liquid (condensate) and vapor using GAC, and monitoring for mass removal and discharge compliance; and
- Monitoring of temperature and pressure to track subsurface heating, pneumatic, and hydraulic control.

During the RD, the need for installation of treatment wells beneath the building will be further evaluated. For purposes of developing this alternative, installation of treatment wells below a portion of the building is considered to be necessary. For the treatment under the building only, all well types would either be installed either at an angle or horizontally (via directional drilling) in order to reach the treatment areas.

This alternative would also require that Area 3 soils containing PCBs above the PRGs in the source areas outside the Site building footprint be addressed prior to implementation of ISTT as follows:

- Pre-design sampling to identify the limits of excavation..
- Decommissioning of existing monitoring wells (those within and around the excavation footprints).
- Installation (and removal) of sheet piling and associated tie-backs.
- Excavation dewatering.
- On-site treatment of contaminated groundwater that is collected as part of any necessary dewatering operations and subsequent discharge to a POTW or permitted outfall.
- Excavation of soils to a depth of approximately 10 feet yielding approximately 2,640 cubic yards of soils.
- Transport and off-site disposal of excavated soils in accordance with applicable RCRA and TSCA requirements.
- Backfilling excavations with clean fill - along with asphalt paving, topsoil, seeding, etc.

The Stage Road building is expected to remain in place both during and after Site remediation although some operations within the building may need to be temporarily relocated during the remedial action.

Even though the action that is identified with the preferred remedy is anticipated to allow for unrestricted use and unlimited exposure, the Site-wide remedy will be reviewed at least once every five years, since VOC concentrations in groundwater remain above MCLs. If justified by the review, additional remedial actions may be implemented to remove, treat or contain the contaminants.

The environmental benefits of the preferred alternative may be enhanced by consideration, during the design, of technologies and practices that are sustainable in accordance with the both the EPA Region 2's Clean and Green Energy Policy and NYSDEC's Green Remediation Policy[2]. This would include consideration of green remediation technologies and practices.

**Basis for the Remedy Preference**

Although both Alternatives 2 and 3 would achieve the RAOs. Alternative 3 will do so at substantially less cost. The preferred remedy Alternative 3 is protective of human health and the environment because it will significantly reduce the principal threat mass of COCs in both surface and subsurface soils through treatment. Achieving these reductions would substantially reduce contaminants within residual source areas so that downgradient concentrations in groundwater would decrease at a more rapid rate than currently exists. The reduction in contaminant mass through both excavation and thermal treatment would also reduce the risk to human health and the environment and eliminate exposure pathways. The estimated present-worth cost of the preferred alternative is $14.5 million.

Additional investigations conducted subsequent to the release of the OU2 ROD revealed conditions that were not known at the time of its issuance. The additional investigations revealed additional VOC contamination, as well as PCB contamination, in previously investigated areas, both outside and beneath the Site building. The geological conditions prevented the original OU2 SVE remedy from fully achieving remediation goals in Area 4.

Based upon the information currently available, the EPA and NYSDEC believe that the assessment of the three alternatives has produced a preferred remedy that would provide the best balance of trade-offs in assessing the evaluating criteria and satisfy the statutory requirements of CERCLA §121(b) in that the remedy be 1) protective of human health and the environment; 2) be cost effective; and, 3) utilize permanent solutions, alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred alternative will comply with ARARs and satisfy the preference for treatment as a principal element. With respect to the two modifying criteria of state and community acceptance, NYSDEC concurs with the preferred alternative. Community acceptance will be evaluated upon the close of the public comment period.

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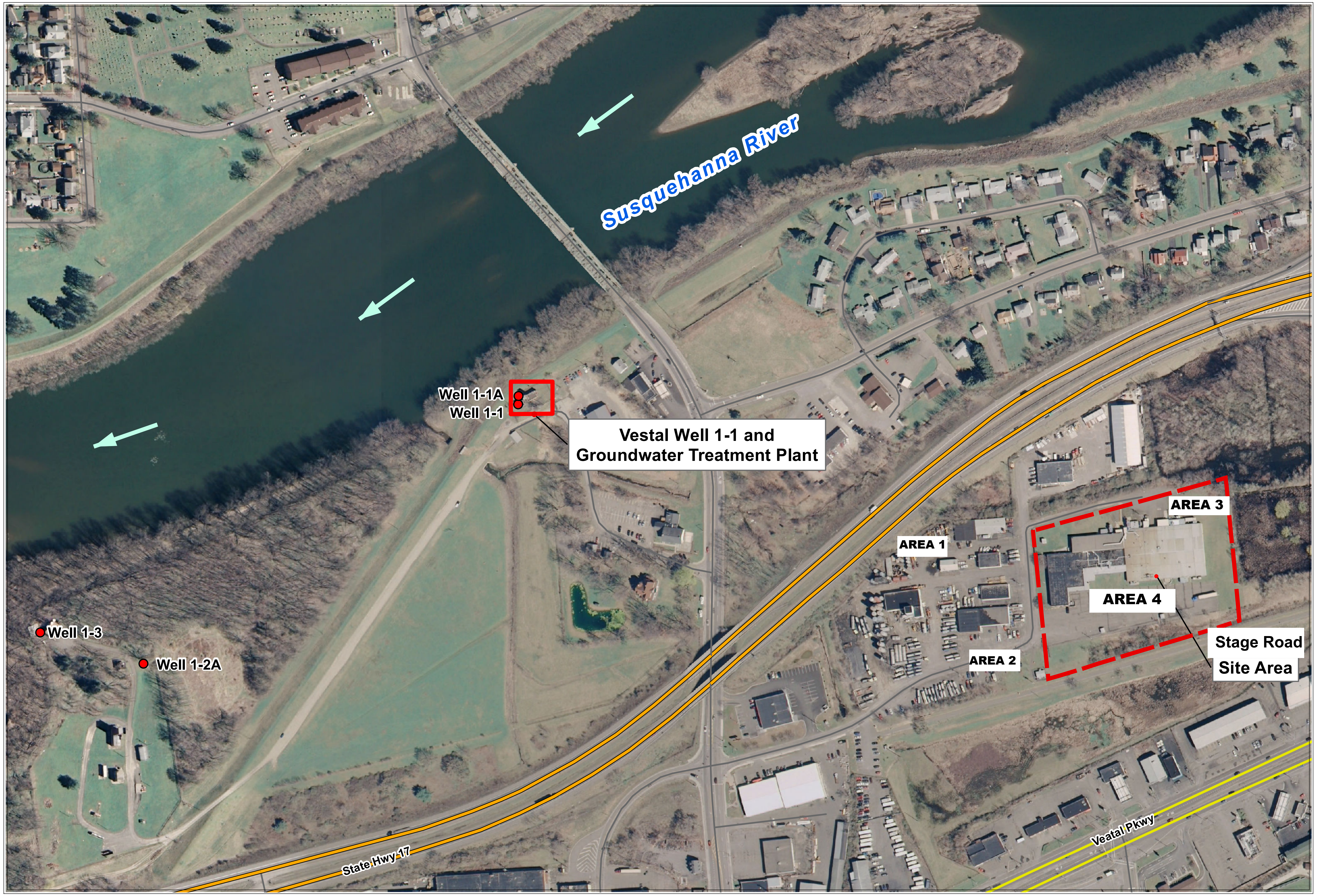
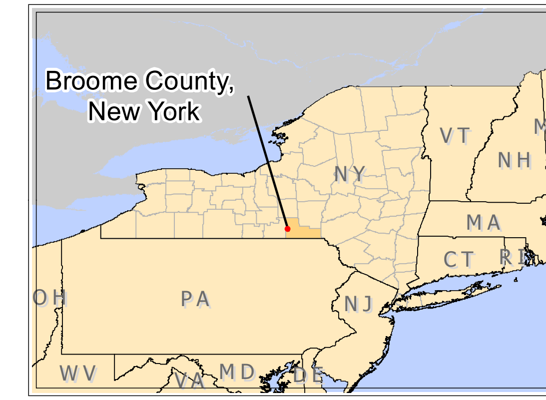
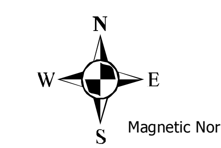
[2] See http://www.epa.gov/greenercleanups/epa-region-2-clean-and-green-policy and http://www.dec.ny.gov/docs/remediation_hudson_pdf/der31.pdf








**Legend**

- Well Location
- Flow Direction

Map created using orthoimagery data from NY state website, sample result data in 2010.

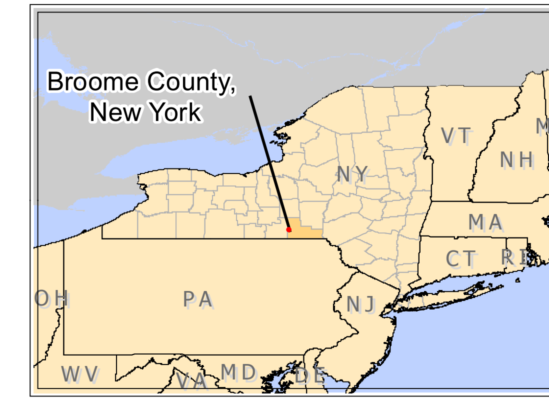
Map Creation Date: 11 April 2016

Coordinate system: New York State Plane (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

300 0 300 Feet

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\arcinfoprojects\SERAS01\SERA00064_Vestal_Chlorinated\FS_Report_2016\064_FS2016_f1_SIteLocation_SurroundingAreas_f1.mxd

| U.S EPA Environmental Response Team<br>Scientific Engineering Response and Analytical Services<br>EP-W-09-031<br>W.A.# SERAS-064 | Figure 1<br>Site Location and Surrounding Areas<br>Vestal Chlorinated Solvent Site<br>Vestal, New York |
|---|---|



N
W
E
S
Magnetic North

## Legend

Potential Excavation Areas

- West Parking Lot Area (9,300 sq.ft., 386 ft.)
- East Parking Lot Area (9,950 sq.ft., 413 ft.)
- Northeast Corner of Building (15,619 sq.ft., 537 ft.)

Contaminated Areas

- West Parking Lot Area (8,457 sq.ft.)
- East Parking Lot Area (9,419 sq.ft.)
- Northeast Side of Building (12,839 sq.ft.)
- Beneath Northeast Corner(1,984 sq.ft.)
- Beneath Building (9,010 sq.ft.)
- Defined Extent of PCB Contamination > 3 mg/kg (1,517 sq.ft.)

Map created using orthoimagery data from NY state website, sample result data in 2012.

Map Creation Date: 30 March 2016

Coordinate system: New York State Plan (Central)
FIPS: 3102
Datum: NAD83
Units: Feet

60 0 60
Feet

The above areas represent the extent of all contaminants of concern (COCs) that are discussed in the FS narrative.

Note:
sq.ft. = square feet

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# SERAS-064

Figure 2
Maximum Extents of Contamination Exceeding Secondary Remediation Goals
Vestal Chlorinated Solvent Site
Vestal, New York

Data: g:\arcviewprojects\SERAS01\00-064
MXD file: g:\ArcInfoProjects\SERAS01\SER00064_Vestal Chlorinated\FS_Report_2016\064_FS2016_f9_MaxI_Extents_ofContamination_ExceedingSecondaryRemediationGoals_f9V2.mxd

# Attachment 2

## Public Notice – Commencement of Public Comment Period

## SOUTHERN TIER VIEWS

JEFF KELLAM

A building which was the former site of Binghamton State Hospital

Upload your panoramas at pressconnects.com/myphotos

# Veterans support program coming to Broome County

ANTHONY BORRELLI
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Veterans in Broome County will be getting their own peer-to-peer support program, courtesy of $120,000 in state funding, officials announced Wednesday.

The Joseph P. Dwyer Peer-to-Peer Veterans Support Program is designed to provide a safe space for counseling among veterans, outreach and education opportunities, while aiming to help deal with the gap between clinical services and family support, according to state Sen. Fred Akshar's office.

Through the program, local veterans will conduct one-on-one and group setting support meetings, offer referral services, help integrate veterans into the community and provide discussion forums.

Broome will be among 16 counties statewide to enact the program, which is expected to begin locally by the end of 2016 after officials coordinate with local veterans to identify specific needs.

On Wednesday, Akshar said it became clear to him early on that more support services were essential for local veterans. Akshar said his office worked to secure $120,000 in the state's budget to expand the Dwyer program to the Southern Tier.

"The Dwyer Program is very versatile," he said. "Each county can use a bottom-upapproach to identify the needs of veterans in their area and structure their program accordingly."

Reports from the U.S. Department of Veterans Affairs say one in three veterans who served in Iraq and Afghanistan suffer from some degree of post traumatic stress disorder (PTSD).

The department also reports 19 veterans commit suicide every day across the country.

Broome County Executive Debbie Preston said the new program will help veterans begin to heal after returning home from service.

"This new peer-to-peer program will be a great benefit because the veterans will be able to confide in other veterans, who understand what they went through," Preston said Wednesday.

*Follow Anthony Borrelli on Twitter* @PSBABorrelli

# New York eyes challenge to ban on sports betting

JOSEPH SPECTOR
JSPECTOR@PRESSCONNECTS.COM

ALBANY – A state assemblyman says he may seek a state law that would legalize sports betting in New York in a bid to fight the federal ban.

After New Jersey's sports-betting law was struck down in federal court this month, Assembly Racing Committee chairman Gary Pretlow, D-Mount Vernon, said he'll try a similar path in New York.

Pretlow said he hopes to introduce legislation that would allow New York to take sports bets, aiming to take away from Nevada's sports books.

"I am a believer in legalizing sports betting," Pretlow said.

The legislation faces long odds, as it would in the courts even it was passed by the Legislature and signed into law by Gov. Andrew Cuomo. The state Legislature returns to Albany in January.

Senate Racing Committee chairman John Bonacic, R-Mount Hope, Orange County, was circumspect of a possible New York bill

"Any discussion of legalizing sports betting in NY is premature at this point. There are significant legal issues to consider before undertaking this endeavor," he said in a statement.

New Jersey has tried repeatedly to legalize sports betting to help its ailing casinos and racetracks, but federal courts have rejected each attempt.

Pretlow's effort — which he first mentioned earlier this month at a gambling conference in Saratoga — comes amid an increasingly saturated gambling market in the Northeast.

New York has nine racetracks with video-lottery terminals, as well as five American Indian-run casinos and four upstate casinos that are set to open as early as next year.

The state is facing growing competition from casinos planned in Massachusetts, as well as the potential of casinos in northern New Jersey.

In June, the state Legislature passed a bill to legalize daily fantasy sports contests, and Cuomo signed it earlier this month.

Pretlow said his bill would largely seek to pressure Congress to change the nation's sports betting laws.

# Attachment 3

## August 30, 2016 Public Meeting Transcript

UNITED STATE ENVIRONMENTAL PROTECTION AGENCY

REGION II

- - - - - - - - - - - - - - - - - - - - - - - - - - -

VESTAL WELL 1-1 SUPERFUND SITE

PUBLIC MEETING OU-2 PROPOSED PLAN

- - - - - - - - - - - - - - - - - - - - - - - - - - -

Vestal Town Hall

605 Vestal Parkway West

Vestal, New York

August 30, 2016

A P P E A R A N C E S:

SAL BADALAMENTI
Chief, Eastern NY Remediation Section

CECELIA ECHOLS
Community Involvement Coordinator

DAMIAN DUDA
Remedial Project Manager

TERRENCE JOHNSON
Project Manager(Environmental Response Team)

MS. ECHOLS: Thank you all for coming. My name is Cecelia Echols, and I'm the community involvement coordinator for the Vestal water supply Well Superfund Site 1-1, and we're here to discuss operable unit 2 in terms of how we're going to approach the cleanup, the cleanup for the site.

We have several speakers, and as I said, I'm Cecelia Echols. We have Damian Duda, he's the remedial project manager; Sal Badalamenti, section chief; Rob Alvey, hydrogeologist; Terrence Johnson, project manager; Dave Aloysius, he's EPA consultant, along with Terrence, he's with the environmental response team. We have Payson Long, he's with the New York State Department of Environmental Conservation as a project manager, and the New York State Department of Health is Anthony Perretta. He's a public health specialist.

We're here to discuss how we're going to clean up the soil and groundwater. In addition, after the public comment period, which ends September 21st, we will have a responsive summary. Once all of the comments, written, oral or e-mailed to Damian are received, then we will answer all the questions. We'll compile them and put them as part of the responsiveness summary, and then the document will be given to the regional administrator, and she will sign the record of decision.

The proposed plan that we're discussing today, several of you may have a copy, are on our website. You will see the name at the end of the presentation. The PowerPoint presentation should also be on our website. So, you will be able to get a copy of that as well as we only had a few made.

This meeting was announced in the PRESS & SUN BULLETIN, and it started the public comment period on August 23rd. We would like for everyone to hold their questions until the end of Damian's presentation, and then we will open up for questions and answers. I hope everyone has signed in so once the record of decision is finalized, you can be notified that it has been finalized. You will see it on the website. You will be able to go and see how, you know, EPA's put the whole package together. If you don't sign in or if you don't give us your e-mail, you won't be informed. So, I would encourage each and every one to please sign in, and legibly as well.

So, we will move on to Damian's presentation. We also have a stenographer who has to take a record of everything. So, if you can speak up so he can hear and maybe spell your name for him, we would appreciate it. Thank you.

MR. DUDA: This is just a quick agenda. We have welcome and introductions. I'm going to talk a little bit about the Superfund remedial process. Then we're going to talk about the site history of the well, and then the proposed plan of this OU2. This is actually a ROD amendment because we had a project decision for OU2 back in 1990. So, this is the second amendment to that. Then I'm going to talk about the preferred remedy for this. Then we will have questions and answers and closing.

The Comprehensive Environmental Response, Compensation and Liability Act was something that Congress enacted back in 1980 to give the federal government authority to clean up contaminated hazardous waste sites, and under the program federal funds are allocated to do that.

The Superfund remedy selection process is basically these steps. We list the site on the National Priorities List so that we can start working on it. Then we do a remedial investigation and feasibility study for the project. We investigate, we sample, we drill wells, sample groundwater, soils, whatever we need to on that particular site. Then we propose a feasibility -- we do a feasibility study where we propose a preferred remedy for the cleanup of that site. We issue a proposed plan, which we have which is what we're going to be discussing tonight. Then ultimately, as Cecelia said, we have a record of decision and then we go into the actual nitty-gritty of the cleanup of the project.

We have a design. We have remedial action where we do construction. We also have operation and maintenance requirements depending on what kind of a treatment plant it is, if we have a treatment plant. Then we do a long-term response action; in other words, we clean up the groundwater for a period of time, ten years at that point.

The National Priorities List is how we get the Superfund Site on our cleanup agenda. So, we basically -- it enables -- it basically enables EPA to initiate and oversee the cleanup of hazardous waste sites. And the Vestal Water Supply Well 1-1, the Superfund Site, was added to the NPL in September of '83 as a result of all the volatile organic compounds which were found in 1-1.

The Vestal Well 1-1 is located in Vestal, of course, Broome County, near the Susquehanna. The groundwater flows in a northeasterly direction -- I'm sorry, a northwest direction. Approximately 28,000 people live in the Vestal area, and the majority of the population is on public water. We set up the site investigation into the western and eastern portions of the site.

In the western portion we actually had the wellfield and the treatment plant, and there's also a fire department training center there, some state-owned forest lands, and a recreational field. We are not discussing that part of the site tonight. We are discussing the eastern portion of the site tonight, which is the Stage Road Industrial Park. Now, that occupies about 5.5 acres, and we're focusing down to the 200 State Road operation, which is the huge, the 60,000-square-foot building. In the original OU2, we divided the Stage Road Industrial Park into four areas.

So, this is the map of all the area. This is the wellfield and this is the treatment plant area here. Then this is the Stage Road Industrial Park, and this is where we had four areas, area one, area two, area three, and area four (indicating). And tonight we're going to be discussing area three and area four.

The Vestal 1-1 Site was divided into what we call operable units so that we can focus our investigation on groundwater and soils, and soils mainly is the reason we have the issue at the groundwater because the soils are contaminated and they're continuing to contaminate the groundwater.

So, for the groundwater in 1986 we issued a record of decision, which is EPA's documentation of the selected remedy, and in that case we installed an air stripper on the well. We sampled the groundwater for VOC contamination. It was about the restoration of the water district one, hydraulic containment of the contaminant plume, and an issue of an investigation for the soil contamination. So, all that started back in '86.

In 1990 for the second operable unit or the soils, the selected remedy at that time, 26 years ago, was in-situ vapor extraction for the VOC contaminated soils in all four areas. And what that is is it extracts the vapors from the soil and treats them so that we eliminate the possibility for further contamination.

The monitoring program was to evaluate how the SVA was working, and the monitoring program, also, the original remedy was to assess inorganic contamination, which ultimately we determined that there was no issue with respect to inorganics. That's metals, lead, that sort of thing. It was all volatile organic compounds.

So, the site history is pretty much in '78, that's when they first found volatile organic contamination in the wells, and they were chlorinated VOCs like TCE, DCE, those sorts of contaminates. And in '86 and '88, through '88, the New York State Department of Conservation was in charge of the investigation, and they did a lot of investigatory work on the groundwater that was contaminated with VOCs.

During this time the VOCs were found in the soils at the Stage Road Industrial Park and they were determined to be the primary source of the contamination to the groundwater. In 1990, because of the contamination, the Vestal Water Supply Well 1-1 was shut down and abandoned.

In early 1995, a new well was drilled to supply water, and that's 1-1A, which still is in there now, and that was installed to provide public water for the Vestal water supply. However, pretty much five months or six months later it was removed from the town's water supply service because the town no longer needed that water.

So, in '93 that treatment plant was constructed to treat the VOC contaminated water from well 1-1A, but since the town no longer needed it, we still treated the well, though, we still treated the well. Early in 1997 that soil vapor extraction which was part of the selected remedy was installed in area two and it worked in area two. It was able to remove all of volatile organic vapors that were there. But in 2000, as a result of the completion, we -- the soil was -- we were done. Let's put it that way.

In 2003, we installed the soil

vapor extraction system for area four, and that operated for about two years. Then, unfortunately, because of the nature of the hydrogeology in that location it was very hard for us to extract vapors from the tight soils. As a result, we got some VOCs out but not enough, and because we could no longer operate the system efficiently, we had to close it down.

So, as a result of that, there was the EPA started to get involved again to do further investigation of the soil contamination. So, in 2010, the EPA's environmental response team performed -- proposed a work plan to go out there and really do some thorough investigation of the soils in that area, areas three and four. VOC contamination was ultimately found in areas three and four, and also a little bit beneath the building that was there.

One other thing that we found during the investigation was some PCB contamination that was in area three. This is area three, it's in the northeast corner of the building. So, as a result of all our investigation, we sampled a lot in that area, in three and four, and we came up with it this year, but the focus feasibility study which identified the contamination. It identified selected remedial alternatives that we could do to remedy the soils and clean them up.

Right now DEC still maintains the groundwater treatment plant for well 1-1A, and we also sample sub-slab vapors and indoor air on the building on a biennial basis just as a protective measure. Then we also perform five-year reviews of the site to make sure that it's still protected, and that's mostly because of the groundwater treatment plant.

Now, 200 Stage Road is the focus of the investigation. The area is zoned commercial/industrial and enclosed, as I said, a 60,000-square-foot building formerly used to manufacture transformers and electric circuit boards. It's currently used for automotive work. Area three, as I said, northeast, and areas south are the focus of the investigation. Also adjacent to and underneath the main building in the parking lot are -- and, obviously, once again, the contaminated soils are a continued source of groundwater contamination.

So, this is the building. This is area four down here, and as a result of the investigation, we divided it into two areas; one here and one here for the area fours, and this is the parking lot area. Then also area three is up here, and this little area is where we found the PCBs. This shows contamination, some slight contamination under the buildings both here and here (indicating).

So, as a result of the investigation, we identified these primary contaminants of concern: TCE or trichloroethene; 1,1 trichloroethane or TCA; cis-1,2 dichloroethane or DCE; 1,2,4 trimethylbenzene, and 1,3,5 trimethylbenzene; and also polychlorinated biphenyls, which is PCBs.

The EPA took hundreds of samples, and most of the contamination was found to be between 5 and 20 feet deep.

So, we found high levels of TCE and TCA in area four in those two parking lot areas. They were the primary contaminants of concern there. Then on the northeast corner we found the trimethylbenzene compounds and PCBs as the primary areas of concern in area three.

The trimethylbenzenes is area three were determined to be from a different source of contamination than the VOCs in the southern part of the -- in area four since they weren't found there at all. These were new contaminants that we found on the northeast corner of the building. Then, of course, we did find lower levels of volatile organic compounds under the building; and the presence of PCBs in the soils is believed to have come from the manufacturing, releases from the former transformer manufacturing.

So, I brought this slide in because I just wanted to show you the scope of our investigation. I mean, these are soil samples, borings, installation of groundwater wells, just to show you the extent that we covered on this one Stage -- 200 Stage Road building. So, we know what we have as a result of that.

We also performed a human health risk assessment. In general, the EPA uses a four-step process to cite any human health risks. One is hazard identification, and in this case we found VOCs and PCBs. We have an exposure assessment, whether we have direct contact, ingestion or inhalation. And then a toxicity assessment, and that's the evaluation of the health effects of the chemicals. Then a risk characterization. It's a calculation of cancer risk or non-hazard -- a non-cancer hazard risks.

For this site, the majority of the risk is from the exposures in soils for future construction workers. That's because we're planning on excavating the PCBs. So, there would be an exposure. For the VOCs, the VOCs are so far down in the soils that there's no exposure.

So, for Superfund sites we try to identify remedial action objectives and, of course, cleanup levels. You know, we want to prevent and minimize exposure of the contaminants of concern through those inhalation, direct contact and ingestion. And, in short, protection of future construction workers from VOCs during any excavation.

We also want to ensure the protection of groundwater from the continued release of those VOCs from the soils, and our soil cleanup levels are preliminary remediation goals, and these are based on the New York State Department of Environmental Conservation, Part 375 soil cleanup objectives. We call them SVOs.

So, these are the soil cleanup objectives that we want to get down to for all of these compounds and they're all in milligrams, and they relate directly to those identified in Part 375.

So, as a result of the focus feasible study that we did, we identified three alternatives for the remediation of the soils. The first, and EPA always considers no action as a base for starting remedial alternatives, and in this case no action means no action. So, there's no cost and there's -- you know, it basically stays as is.

The second alternative we looked at was an excavation and offsite disposal, in which case we would dig up all of the soils that were contaminated and ship them off to a facility that accepts them subtitle C or subtitle D depending. And for those -- for that it would cost almost $40 Million to excavate all those soils and dispose of them properly and take about a year.

Alternative three was in-situ thermal treatment and excavation and offsite disposal. In-situ thermal treatment is a common way of releasing VOCs from the soils, in which case we would install some sort of a heat treatment into those soils and that would release the VOCs. Then we would have to take them to an offsite disposal of the PCB soils. That capital cost is about $14.5 Million, which includes both actions and take about 11 to 14 months.

This in-situ thermal treatment,

there are a number of methods that we can use to do that. We have electrical and resistance heating, which is ERH. Then we have steam enhanced extraction, which is SEE. Thermal conduction heating, which is TCH, and those are common acronyms for those methods. Then also we have a combination of methods; in other words, you can use one or two of the methods together.

Like, okay, ERH delivers electrical current installed underground. The heat generated meets resistance from the soil. It converts groundwater and water into steam, vaporizing the contaminants.

Then the steam-enhanced extraction injects steam underground and the steam heats the area immobilizing and evaporating the contaminants.

Then thermal conduction heating is heaters placed in underground steel pipes, and that heats the area hot enough to destroy the chemicals. So, they're all a bit different and all can be used in combination.

Now, when EPA evaluates

alternatives we go through a nine-criteria step process, and the first criteria is threshold criteria, and that's overall protection of human health in the environment. The next one is compliance with what we call applicable or relevant and appropriate -- these are basically the cleanup levels, the maximum contaminant levels for groundwater. There's all sorts of ways that we can make sure that the cleanup goes down to those levels and creates a good environment.

Our next one we call primary balancing criteria, and these are we evaluate the alternatives with respect to long-term effectiveness and permanence. We want to reduce the toxicity, mobility and volume. And also short-term effectiveness in like how long is -- you know, if the site is going to be cleaned up in a month, a year, that would be the short-term. Then the long-term would also be involved with respect to once we finish up the project.

Then also the implementabiilty. Can we do this here, is this something that we can do. So, we evaluate that. And, of course, cost is always an issue.

The modifying criteria is basically state and community acceptance. So, we consult with our state, in this case the New York State Department of Environmental Conservation, and we evaluate the remedy with them to make sure that they're on board with what we're going to do. Then, of course, the community, we want to make sure that they're aware of what we're doing and make sure that they are on board with what we are planning.

So, in this case our preferred remedy was alternative three, which is the ISTT and the excavation and offsite disposal. The excavation of the PCBs is about 730 cubic yards. Then, of course, the thermal treatment of the VOC-contaminated soils.

In our focus feasibility study we put -- we identified a conceptual approach. It isn't necessarily an approach that we will definitely do, but during our design of the preferred remedy we will evaluate it a little bit further. But in this case we decided to use the TCH, which are the thermal conductive wells, in combination with the steam where we extract the soil vapors steaming from the wells. We capture the vaporized contaminants and then treat the extracted liquid with grandular activated carbon, and then we also monitor the temperature and pressure with respect to the subsurface heating.

Right now we have the administrative record file, which are all the documents that we have used to make this decision. It includes the feasibility study. It includes our conceptual site model, which is like our remedial investigation, and the health - the human health risk assessment. A number of documents, and they are in the administrative record and they have been added to our original OU2 record, which was done in 1990. So, the full record is there.

If you look at the index, the last reports are the one that were used in this evaluation. So, we have that at the town library, and then also at the EPA records center, which is in New York on our 18th floor.

For any general inquiries, Cecelia is our community involvement coordinator, and any additional information is at that website. That's -- we have new websites now for all of our sites. So, they're a little bit more usable and you can find out many, many documents, they're all linked to that site about that document.

So, if you have any specific questions or if you have any written comments you want to send to me or any additional information, I'm available at this -- unfortunately, my phone number is not on there. I can get that to you anytime. And as Cecilia said, Wednesday, the 21st of September, is the last day we accept comments on the preferred remedy and this presentation of the proposed manner. And, also, I said the administrative record can be found at the site.

So, that's about all I have. If you have any questions --

MS. ECHOLS: Any questions?

MR. ROMA: My name is Frank Roma, I'm a member of the Western Broome Environmental Stakeholders Coalition, and this is about as far western Broome as we can get. We've been following basically the IBM cleanup, but at the same time there's a lot of contamination in the area, of course, this being one.

What were the -- two things on the contamination. What were the sources of the contamination?

MR. DUDA: Historically -- we don't have a lot of information about the original occupants. There are a number of ideas that we have. There was a manufacturer of transformers which would have resulted in the PCBs. VOCs were used as solvents in many situations. I don't know if we have any further information.

Terrence Johnson from ERT.

MR. JOHNSON: They manufactured circuit boards there. So, it was used in the process either to degrease or to clean equipment, I suppose. That's usually how it's used.

MR. ALVEY: I'm Rob Alvey, hydrogeologist with the EPA. The original responsible parties were connected with the contaminants that came out, other than the PCBs, which we didn't know at that time, and there was a settlement with the state based on the liability that had been determined.

MR. DUDA: I think there was some indiction in the press release about the responsibile parties, if I'm not mistaken.

MR. ROMA: I think you can see over the years it's been kind of a learning process for what we -- what's needed to be done and, you know, I think what you're coming up now, as far I can tell, is probably one of the good ways to do it. But I was a little concerned that that large difference between this remedy and the second remedy where you're taking all the soil out before you treat it; in other words, it seems like you could treat all that soil somewhere and bring it or landfill it, however you want to do it, but maybe you can comment on that.

MR. DUDA: I can ask Dave Aloysius.

MR. ALOYSIUS: Yeah. The costs that were presented were excavation and offsite disposal. All of -- basically that covers everything as far as treatment. So, those soils would be treated offsite.

Now, obviously, with our analysis, in-situ thermal treatment appears to be the most ideal way to treat the soils. Even just from a health safety standpoint, clearly, the in-situ thermal treatment, the risks to offsite population are significantly less, and even to onsite workers would be less as opposed to excavation and offsite disposal.

Excavation and offsite disposal, you know, again, it was just generically touched on, but that -- and, obviously, you know, the cost. You know, you're dealing with installing sheet piling, which could be -- which could cause like a noise factor for the surrounding areas. Then you have to de-water the excavation and that water has to be dealt with.

So, I'm not really sure what your

exact question is. I'm not sure if I answered your question.

MR. DUDA: Just for the excavation, you would have many, many trucks leaving the site, and that also would create kind of a short-term impact to the community. Whereas this would actually treat the soil in place and you wouldn't have the disturbance to the community or the industrial park, for that matter.

MR. BADALAMENTI: And it would be just as effective.

MR. ROMA: I think I can narrow down my question a little better.

You're hauling away soil only from area three?

MR. DUDA: And four.

MR. ROMA: And four, both. So --

MR. DUDA: Well, what do you mean? Do you mean the preferred remedy?

MR. ROMA: The preferred remedy.

MR. DUDA: The preferred remedy, we're only hauling away the PCB-contaminated soil from area three. That's a much smaller cubic yardage than it would be for the thousands of cubic yards --

MR. ROMA: Right. Got you.

MR. DUDA: -- that we would have to excavate from the entire area at three and four.

MR. ALVEY: That would all require a quite -- a little bit more of a treatment through thermal onsite and the health and safety, and it's small enough that we can get that out.

MR. ROMA: Then my last question for now. How are you treating the contamination under the building?

MR. DUDA: We -- until we get to the design, we won't know exactly how we will do that. There's a possibility of drilling, putting wells directly down through the floor or directionally drill underneath, and also whether or not at this point depending on what we -- we probably would resample. At this point those volatile organics under the building are much, much less and really may or may not need to be even treated once we've started remedying the outside soil. I don't know.

Terrence, you have any comment on that?

MR. JOHNSON: Yeah. I think we would propose to treat the entire contaminated area from my perspective. We may probably ask, well, what is the margin of cost to treat under the building where the contaminations are, say, 100 times more lower than the concentrations that we see outside the building in the parking lot, for example.

So, if that margin of cost is 5 or 10 percent above the cost of treating everything else -- I'm just throwing numbers out -- it would probably go off. We wouldn't treat under the building just because that would double your cost for what you're going to get. It may not be worth it.

MR. ROMA: You're still going for the goals?

MR. DUDA: Yes.

MR. BADALAMENTI: Yes, we are.

MR. DUDA: The cleanup goals are still going through.

As you can see in area -- well, in area four here, that there's a little more contamination in the building at this point, whatever, what we've found, and there's a little bit of contamination here. So, this is a little smaller area than here but, you know, depending on how when we get to the point of the design of the project, we will make a determination at that point and see where we go from there.

But at this point in time we don't -- and we will also probably do a further evaluation of the PCB contaminants once we've gone into design to make sure that we get everything.

MR. JOHNSON: It may well be that once we heat up that close to the building the temperature, you will have by conduction sort of a heat treatment in the building.

MR. DUDA: There will be a residual effect.

MR. JOHNSON: The concentrations will be lower for this building. We may not have to get a higher concentration to have a positive impact. So, once we get there we will kind of, you know, check out the logistics and see what makes sense. We may not have to heat as much and just suck the vapors out.

MR. ALOYSIUS: As far as the mass of contamination, we also have to just look at, you know, the total mass. So, we deal like in kilograms. So, you know, let's just arbitrarily say we are dealing in pounds.

Underneath the building there is only about 1 percent of the contamination that is found elsewhere across the entire site. So, even though that pink blob beneath the building looks relatively large, there's only a pound of contamination and, again, it's just an arbitrary number. A pound of contamination compared to the 99 pounds that are dispersed across.

So, you know, again, it will be somewhat of a cost benefit analysis when we get to that point whether or not that area will be treated.

MR. JOHNSON: That's the 100 times that I mentioned. If the concentrations are 100 times higher than the mass to the mass.

MR. DUDA: Any further questions?

MR. MAJEWSKI: Fran Majewski, the Town of Vestal Council. You're claiming that you're going to use the alternative three method, and I'm looking at your description and it says it destroys some of the chemicals. Can you tell us what chemicals remain and at what levels?

MR. DUDA: Well, I mean, nothing is totally foolproof, but at this point in time all the VOCs that we have there will be treated. I mean, some of the chemicals, I don't know exactly --

MR. JOHNSON: There will be destruction, but the primary mode of action is you heat it up and it vaporizes and then you would capture the vapors. So, even though some of it could be destroyed, basically the higher temperature from the heat conduction, primarily it is still looking like this is going to primarily get the vapors out.

MR. MAJEWSKI: You've done this in the past?

MR. DUDA: Yes.

MR. MAJEWSKI: What kind of a success rate?

MR. JOHNSON: It's pretty successful. I mean, you could -- typically you get over 99 percent of it out, the mass in there.

MR. ALVEY: We did one in conjunction with New York State and the New York State DEC down in New York next to a bus depot. The bus depot, it stayed in service the whole time and passengers and the repairs could be done there. The thermal oxidation primers or TCHs you have controlling the spills over the years worked and it was gone.

MR. DUDA: One thing about that page identifying the IST methods, that is actually a statement from our citizen's guide. So, it's not specifically geared to this site, it's a general description of the process.

So, in this case when we're talking about our chemicals, they're not just some chemicals, they're our contaminants of concern, and those are the ones that we are focusing on and those are the ones that will be treated and destroyed.

MR. TORRANCE: Hi, I'm Larry Torrance. You said that this just deals with, I think you said the west but not the east, or the other way around?

MR. DUDA: Well, I sort of put this together with respect to organizing the sites, because it's the whole site. The whole Vestal Water Supply Well 1-1 Site is this part and the wells, that's all one Superfund Site.

But at this point in time for this preferred remedy, we're only dealing with the eastern portion of that particular site, of this site.

MR. TORRANCE: Is the other portion being addressed in some similar fashion?

MR. DUDA: The other portion is not. There's no soil contamination there. We are still -- the groundwater is still contaminated. So that's part of the project. The treatment plant is still in place, and DDC is monitoring it at this point and sampling. Doing monitoring, well sampling and also sampling of the well itself, continuing. That's continuing.

And we've done these five-year reviews. I think we're in -- the next one will be the fourth one, but since the groundwater is still above what we call maximum contaminant levels, we will still do a five-year review, including this project as part of that, hoping that those groundwater levels will be reduced to below our cleanup levels.

MR. TORRANCE: So, just so I understand. So, then, am I correct in understanding that the contamination is really derived from this plant?

MR. DUDA: Yes. We call this the source --

MR. BADALAMENTI: The source.

MR. DUDA: -- of the contamination.

So, if this area is treated, the groundwater should clean up. I mean, that's the logic we're trying to put across here.

MR. TORRANCE: Then kind of a related question.

So, if I understand correctly that

well 1-1 and 1-1A, you're not using them right now?

MR. DUDA: No. Well 1-1 just does not exist anymore. That was abandoned many years ago. Well 1-1A was not used as a water supply since 1995.

So, at this point in time I don't see that well 1-1A would ever be used for drinking water, but there is a possibility that if something happens to the water supply, that Vestal may come back at us, but I have no information to indicate that.

MR. LONG: No.

MR. DUDA: At this point in time it hasn't been used as a water supply for 20 years. So, I can't imagine that it would be used again as a water supply since they have enough wells on other areas to satisfy the 28,000 people. But if that were ever considered, we certainly would take a strong look at that groundwater.

Any other questions?

MR. ELDER: Dave Elder, resident of the Town of Vestal. The thermal treatment sounds -- you know, seems like it makes a lot of sense, but I'm just curious as to how that will affect the air quality in the area while it's being conducted?

MR. DUDA: He wanted to see how the air quality would be affected if we did the thermal treatment.

MR. JOHNSON: Because of the way the system -- it's a two-step process. One, you heat the soil, and the second phase is you kind of just suck the vapors out. So, it's going to be under negative pressure.

So, there should be, in theory, no impact on the atmosphere because you're pulling air -- as a matter of fact, the atmosphere is feeding, ultimately feeding that air into the subsurface that's being pulled out to get the contaminated vapors out. So, in principle, there should be no impact on the atmosphere.

What's typically done at sites is that you monitor anyway to make sure there's no fugitive emissions. So, before you start, you come out. You set up your monitoring system and get some background air to establish what your background concentrations are in the atmosphere, and then while -- you monitor through the system through the operation to make sure that there's no adverse impact.

MR. DUDA: Because it's a pretty contained system when we're doing the work.

Any further questions?

MR. TORRANCE: No.

MS. AGNESHWAR: Shoba Agneshwar, Vestal Town Board. My question is -- I think you addressed it in one your slides. The last well was closed in 1990 or something?

MR. DUDA: 1995, I think.

MS. AGNESHWAR: So, 1995. So, when was the last -- any remediation done on this area, do you know?

MR. DUDA: On the well, you mean?

MS. AGNESHWAR: On the contaminated soil?

MR. DUDA: On this area?

MS. AGNESHWAR: Uh-huh.

MR. DUDA: Like I said, they had an SV system in there and --

MS. AGNESHWAR: Way back in 2000 or

something?

MR. DUDA: Yes, and that operated, I don't know....

MR. JOHNSON: 2002.

MR. DUDA: 2002, and that's the last time anything was treated.

MS. AGNESHWAR: Between then and now has the contaminated field expanded or contracted or remained the same?

MR. DUDA: At this point in time I don't have any -- I don't see that the contaminate, the aquifer contamination has expanded, and the soil seems pretty contained. It's just around those areas in the parking lot and that northeast corridor.

We don't have any information, and as I showed you that one slide with the soils, all the investigation. Hold on one second.

As you can see, I mean, Terrence and Dave covered that whole area and that's the resulting investigation and the data is what we found, and that's why we're going the way we're going here. So, as far as expanding outside of this area, there doesn't seem to be any indication of that.

MS. AGNESHWAR: So, when was that done, that testing?

MR. DUDA: Well, we did this in the last five or six years.

MS. AGNESHWAR: So, that data was gathered within the past five years?

MR. DUDA: Yes. Oh, yes. In fact, when was the last time we got this data, Terrence?

MR. JOHNSON: 2014.

MR. DUDA: 2014, okay.

MS. ECHOLS: He can't hear you.

MR. JOHNSON: Probably 2014.

MR. DUDA: So, the last sampling was 2014. They put the conceptual seg model together identifying that all and we did a risk assessment. Then we did the feasibility study and here we are now.

MR. JOHNSON: It was a step process.

MR. DUDA: Right.

MR. JOHNSON: We did phase one. Based on what we found, we had to collect more data to completely do the assessment.

The nature of the contaminants, the way the contaminant is, it's bound to the soil, it's a solvent in what we call a residual phase with the soil, which means it is trapped within the soil so you cannot take it or move it. So, the footprint or the three-dimensional geometry of the source will be stable over time.

MS. AGNESHWAR: So, is it dormant as we speak?

MR. JOHNSON: It's not dormant but it's stable in its current configuration, but it continues to feed the groundwater, and it feeds it for --

MS. AGNESHWAR: If left untreated, it will continue to feed, is that what I'm hearing?

MR. JOHNSON: Correct, for hundreds of years. Beyond our lifetime.

MR. DUDA: So, the ultimate goal to, as I said, is to make sure that the groundwater is being treated. It makes perfect sense to destroy the source and then the groundwater will be clean. At many Superfund sites we work on the concept of source feeding groundwater contamination.

MS. AGNESHWAR: But at what point do you consider it a success, like is there a certain percentage you're wanting to hit; 80 percent, 90 percent, 70 percent? When do you consider this a success?

MR. JOHNSON: You have the target concentrations, right?

MR. DUDA: Yes. When these -- when our soil cleanup objectives are met, it's a success. So, when we've sampled the soil and we've gotten these levels or below these levels, we are a success. And historically the information that I've read about the thermal treatment is that we should be able to get to these levels or below.

But until we actually do the work and sample, you know, we don't have the exact numbers there.

Anything else?

MS. MESSINA: I'm Sue Messina, the Vestal Town Council. So, you said the PCBs appeared after the fact?

MR. DUDA: Yes. When they did the investigation back when the OU2 ROD was done back 1990, there did not seem to be that issue. I don't know why the sampling didn't pick it up back then, but it's hard to say at this point. There might have been more activity since that point. That was 26 years ago.

MS. MESSINA: I guess my question is, though: Is that a separate contamination, are you looking at it as a separate contamination --

MR. DUDA: Yes.

MS. MESSINA: -- or a part of the initial?

MR. DUDA: At this point --

MR. ALVEY: Separate and only limited to soils. The PCBs never show up in groundwater.

MS. MESSINA: Okay. That was my next question. Thank you.

MR. JOHNSON: Also those concentrations, those concentrations on the slide there, they are very, very protective. You know, I mean, you can get -- the idea is to get rid of the source. The source is the solvent that's trapped in the soil, the PCE solvent that's trapped in the soil that's feeding the groundwater.

So, you get to those concentrations, we've seen these for a long time. So, that's already protective. You can get to a higher concentration in the soils and it will be protective, but we still aim for those anyway to be -- to err on the side on conservatism and get to a point where we're spinning our wheels and we know we're safe and will make -- we will -- we can make that type of call.

We're spending more money and we're not seeing the value for our money spending, but we know we're protecting the groundwater. Then we have intermediate concentrations that we would have in that phase, then we have protected groundwater.

MR. DUDA: Any follow-up questions?

MR. TORRANCE: Larry Torrance again. Just more questions.

So, the thermal treatment would work on these contaminants?

MR. DUDA: Yes, just these contaminants here, and any other residual chlorinated solvents that might be in the ground that aren't listed here, but these are the primary contaminates that we have.

So, ultimately, if we clean up these, we clean up others. We've cleaned up a lot of chlorinated solvents.

MR. TORRANCE: So, that treatment would work on stuff you don't have listed there?

MR. DUDA: Yes. Yes. Any volatile organic compound it would work on.

MR. JOHNSON: Or semivolatile.

MR. DUDA: Or semivolatile, which are PHs and things like that.

MR. ROMA: After you do all the treatment and excavation, that area, the OU2 is cleaned up?

MR. DUDA: Yes, area three and four.

MR. ROMA: Then would you expect well 1-1A to be cleaned up eventually?

MR. DUDA: Yes. I mean, that's the logic.

MR. ALVEY: We also have groundwater monitoring wells near this area itself. We would expect to see them clear up first. That will give us a better indication as we go further out, that it will clean up that way, too. That is monitoring.

MR. DUDA: The wellfield is about 1,500 feet west of this side. So, that's a fairly close distance.

MR. ROMA: But it will take a while, years?

MR. DUDA: It will take time.

MR. JOHNSON: This particular groundwater plume that extends from the source to the wells, and that will flush over time as you keep pumping. So, it may be 10 years, it may 20 years, but it certainly won't be --

MR. DUDA: A hundred years.

MR. JOHNSON: Your grand-kids will be alive.

MR. DUDA: Feel free to take home one of the citizen's guides to in-situ thermal treatment. That pretty much explains in a little bit more detail of how we're going to be do this. And, as I said, during the design phrase of this project, we'll be assessing all those methods, a combination of methods and we'll also probably be further defining the PCBs that are out there as far as how far we could excavate and, you know, remove it. So...

MR. ROMA: Will you have another information meeting at some point?

MR. DUDA: I would think -- we were just talking about that. We'll probably have, you know, some sort of an informational session or an availability session we call it, where before we actually do the work, would come up and say: This is what we're going to be doing, you know, that sort of thing. It's not like a public meeting where you have a court reporter, but, you know, we put up information about what we're going to be doing and, you know, all that air sampling that we might be doing externally and that sort of thing to make sure everybody -- especially the people that might be working in the building where we're going to be operating to make sure that everybody's okay.

MR. BADALAMENTI: We'll have a lot more of the details nailed down after the design is done and we will be able to --

MR. ROMA: When would you expect that?

MR. BADALAMENTI: Well, that's going to be dependent upon the federal budget and when this project gets the funding.

MR. ROMA: The project isn't funded yet?

MR. BADALAMENTI: It is not.

MR. DUDA: But we've gotten this far and it's a great step, it really is; that we have a preferred remedy and that we are able to move forward from there.

MR. ALVEY: And with the RODs coming up, you will know what to request on the budget.

MR. DUDA: I mean, these cost figures are obviously estimated, but it gives us some idea of the scope of the project with respect to costs. And, obviously, costs, as I said before, is one of the comparative analyses that we do and, you know, it does come into play. I mean, if something is exorbitantly expensive and something isn't, and the something that isn't is equally protective and would be able to clean up the environment, it just makes sense to go with the cheaper alternative because it's going to do the same job with less impact to the community.

MR. ROMA: Thank you for not using acronyms.

MR. DUDA: Yes, the government does use acronyms quite a bit. I mean, when you have these compounds like TCE and TCA and PCE or something, at this point it's just easier to use those than to say trichloroethene, dichloroethane, those sort of things.

MR. BADALAMENTI: That is correct. I'm sorry.

MS. ECHOLS: Does anyone else have any questions?

(Whereupon there was no response)

MS. ECHOLS: No.

MR. DUDA: Like I said, you know, you call me. You know, I'm on the last slide, or e-mail me or anything that I can respond quickly. It's Duda.damian@epa.gov. It's pretty simple.

MS. ECHOLS: We would like to thank the town hall for allowing us to have the meeting here tonight. Thank you so much for working with us.

MR. SCHAFFER: John Schaffer, the Town of Vestal supervisor. We are going to invest in another well site. We've got two drilled and capped, way far away from those. So, our system is healthy, and we did abandon those in our lifetime.

MR. DUDA: You're talking about the water supply?

MR. SCHAFFER: The water supply. We took a lot of precautions over the last 20 years to get away from that place.

So, it's nice to have you guys out, take your time away from your families to come and explain it to our community. We deeply appreciate it and we hope to see you soon.

MR. DUDA: I know some of these technical terms can be a little hard to understand, but we're here to inform you and help you.

MR. SCHAFFER: We truly appreciate it.

MS. ECHOLS: The public comment period ends on September 21st. So, if you have any other comments, please send them to Damian as soon as possible.

MR. DUDA: I will be tied to my desk.

MS. ECHOLS: Thank you all for coming.

(Whereupon the meeting was adjourned at 8:04 PM)

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STATE OF NEW YORK :

COUNTY OF BROOME :

I, TROY KELLEY, Shorthand Reporter, do certify that the foregoing is a true and accurate transcript of the proceedings In the Matter of a Public Hearing regarding the Vestal Well 1-1 Superfund Site, held in Vestal, New York, on August 30, 2016.

I further certify that I am neither counsel for nor related to any party of said action, nor in any way interested in the result or outcome thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 30th day of August, 2016.

________________________________

TROY KELLEY, Shorthand Reporter

COMPUTER OPERATOR: LORI KRALY