

**FOURTH FIVE-YEAR REVIEW REPORT FOR  
RESIN DISPOSAL SUPERFUND SITE  
ALLEGHENY COUNTY, PENNSYLVANIA**



**December 2015**

**Prepared By:  
United States Environmental Protection Agency  
Region 3  
Philadelphia, Pennsylvania**

A handwritten signature in black ink, appearing to read "Karen Melvin", is written over a horizontal line.

**Karen Melvin, Acting Director  
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U.S. EPA, Region 3**

**DEC 29 2015**

**Date**

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## LIST OF ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
BTAG	Biological Technical Assistance Group
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
COC	Chemical of Concern
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
ESL	Ecological Screening Level
FYR	Five-year Review
ft	Feet
GPRA	Government Performance and Results Act
HAZMAT	Hazardous Materials
HI	Hazard Index
IC	Institutional Control
LNAPL	Light Non-aqueous Phase Liquid
LTGM	Long-term Groundwater Monitoring
MCL	Maximum Contaminant Level
MSL	Mean Sea Level
NAPL	Non-aqueous Phase Liquid
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
OWS	Oil/Water Separator
PADEP	Pennsylvania Department of Environmental Protection
PADER	Pennsylvania Department of Environmental Resources
PICCO	Pennsylvania Industrial Chemical Corporation
POTW	Publicly Owned Treatment Works
PRP	Potentially Responsible Party
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SI	Site Investigation
SWRAU	Site-wide Ready for Anticipated Use
TBC	To-be-considered
µg/L	Micrograms per Liter
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
WESA	West Elizabeth Sanitary Authority

## EXECUTIVE SUMMARY

The Resin Disposal Superfund site (the Site) is located in Jefferson Hills Borough, Allegheny County, Pennsylvania. The Site includes a capped industrial waste landfill used between 1950 and 1964 for disposal of resin manufacturing waste. The landfill covers about 2 acres within a 30-acre parcel of land. Disposal activities at the Site contaminated soil, groundwater, surface water and sediment with petroleum- and coal-derived chemicals.

The United States Environmental Protection Agency (EPA) divided the Site into two operable units (OUs) to manage site cleanup. OU1 addresses waste material in the landfill, contaminated soil, non-aqueous phase liquid (NAPL) and on-property groundwater. OU2 addresses off-property groundwater, seeps and residential wells.

EPA selected the Site's remedies in Records of Decision (RODs) dated 1991 and 1995. Cleanup included installation of a multi-layer cap system over contaminated soils and waste, collection and treatment of leachate, upgrades to the lower landfill dike, installation of infiltration controls, upgrades to the oil/water separator, installation of a skimmer well network, institutional controls and monitoring. EPA deleted the Site from the Superfund program's National Priorities List (NPL) in October 2003.

Since 2011, multiple releases have occurred at the Site as a result of the currently undersized leachate collection and treatment system. In March 2015, EPA approved a remedial design for an upgraded leachate treatment system at the Site. Construction for the upgraded system is currently underway. EPA plans to issue an Explanation of Significant Differences (ESD) to detail design changes determined necessary to the original remedy.

This is the fourth five-year review (FYR) for the Site. The triggering action for this FYR was the signing of the previous FYR on December 30, 2010.

This FYR has concluded that the remedy for OU1 is not protective of human health and the environment in the short or long-term. The remedy for OU1 is not protective due to the following issues: the current leachate treatment system is undersized; the absence of discharge criteria for the leachate treatment system; the presence of contaminated soil and groundwater at the toe of the landfill below the leachate interceptor trench; the current long-term groundwater monitoring (LTGM) program is inadequate; an EPA-approved Operation and Maintenance (O&M) Plan for the Site is not in place; the landfill perimeter fence is damaged; and the presence of contaminated sediment in the unnamed stream. A protectiveness determination of the remedy for OU2 could not be made at the time of the Five-Year Review due to insufficient data available to evaluate potential off-property groundwater contamination. The FYR Summary Form and Section 10.0 document actions required to ensure protectiveness.

## **Government Performance and Results Act (GPRA) Measure Review**

As part of this FYR, the GPRA Measures have also been reviewed. The GPRA Measures and their status are provided as follows:

### **Environmental Indicators**

Human Health: Current human exposure is not controlled (HENC).

Groundwater Migration: Contaminated groundwater migration is under control (GMUC).

### **Site-wide Ready for Anticipated Use (SWRAU)**

The Site originally achieved the SWRAU Measure on June 15, 2006; however, the SWRAU was rescinded on September 27, 2011 due to a series of releases at the Site in 2011.

## FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION				
<b>Site Name:</b> Resin Disposal				
<b>EPA ID:</b> PAD063766828				
<b>Region:</b> 3	<b>State:</b> PA	<b>City/County:</b> Jefferson Hills Borough/Allegheny		
SITE STATUS				
<b>NPL Status:</b> Deleted				
<b>Multiple OUs?</b> Yes	<b>Has the site achieved construction completion?</b> Yes			
REVIEW STATUS				
<b>Lead agency:</b> EPA				
<b>Author name:</b> Robert Wallace, with support provided by Skeo Solutions.				
<b>Author affiliation:</b> EPA Region 3				
<b>Review period:</b> March 2015 – December 2015				
<b>Date of site inspection:</b> May 27, 2015				
<b>Type of review:</b> Statutory				
<b>Review number:</b> 4				
<b>Triggering action date:</b> December 30, 2010				
<b>Due date (<i>five years after triggering action date</i>):</b> December 30, 2015				
Issues and Recommendations Identified in the Five-Year Review:				
<b>OU(s):</b> OU1	<b>Issue Category:</b> Remedy Performance			
	<b>Issue:</b> The current leachate treatment system is undersized as evidenced by the significant hydraulic fluctuations experienced at the Site, which has resulted in multiple releases during the FYR period.			
	<b>Recommendation:</b> Complete construction and begin operation of the new leachate treatment system and decommission the old system. This action is required by the December 2011 Enforcement Letter pursuant to the June 1992 Consent Decree (CD). EPA will document these modifications in an Explanation of Significant Differences (ESD)			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
Yes	Yes	PRP	EPA	12/30/16

**FIVE-YEAR REVIEW SUMMARY FORM (CONTINUED)**

Issues/Recommendations				
<b>OU(s): OU1</b>	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> There are no discharge criteria for discharge of treated effluent into the sanitary sewer system.			
	<b>Recommendation:</b> Establish discharge criteria for the treated effluent that are protective of human health and the environment and document that criteria in an ESD.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA	12/30/16

<b>OU(s): OU1</b>	<b>Issue Category: Operations and Maintenance</b>			
	<b>Issue:</b> An EPA-approved O&M Plan for the Site is not in place.			
	<b>Recommendation:</b> Prepare an O&M Plan for the new treatment system, landfill cap, drainage channels, fence, monitoring points and all associated remedy components.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA	12/30/16

<b>OU(s): OU1</b>	<b>Issue Category: Remedy Performance</b>			
	<b>Issue:</b> Contaminated soil and groundwater are present at the toe of the landfill below the trench system as a result of the 2011 and 2012 releases.			
	<b>Recommendation:</b> Evaluate if response actions are warranted to address the soil and groundwater contamination. This action is required by the December 2011 Enforcement Letter pursuant to June 1992 CD.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA	12/30/16



**FIVE-YEAR REVIEW SUMMARY FORM (CONTINUED)**

<b>OU(s):</b> OU1/OU2	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> The current LTGM program is inadequate to monitor potential releases from the landfill and other areas of the Site.			
	<b>Recommendation:</b> Re-evaluate the LTGM program and incorporate additional existing and/or new wells to adequately monitor potential contaminant migration from the landfill and other areas of the Site. Residential well RW-4 should be sampled prior to the next FYR. RW-4 and LTGM groundwater samples should be analyzed for the full suite of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). This action is required by the December 2011 and August 2012 Enforcement Letters pursuant to the June 1992 CD.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA	12/30/16

<b>OU(s):</b> OU1	<b>Issue Category: Remedy Performance</b>			
	<b>Issue:</b> Additional response actions may be necessary to address contaminated media at the Site resulting from remedy performance issues and to ensure long-term protectiveness of the remedy.			
	<b>Recommendation:</b> Evaluate if additional enforcement actions or a decision document are necessary to require the performance of the additional response actions.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	EPA	EPA	12/30/16

<b>OU(s):</b> OU1/OU2	<b>Issue Category: Remedy Performance</b>			
	<b>Issue:</b> Sediment in the unnamed stream is impacted as a result of the 2011 and 2012 releases.			
	<b>Recommendation:</b> Evaluate response actions to address contaminated sediment in the unnamed stream. This action is required by the December 2011 Enforcement Letter pursuant to the 1992 CD.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA	12/30/16

OU(s): OU1/OU2	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> Sampling of off-property wells TW-19 and TW-24 and perimeter well TW-21 prior to the FYR, as required by the 2012 LTGM Plan, was not conducted. It is unknown if groundwater contamination has migrated off-property to the west in the Pittsburgh Coal formation.			
	<b>Recommendation:</b> Sample wells TW-19, TW-21 and TW-24 to evaluate groundwater concentrations off-property and at the property perimeter as required by the 2012 LTGM Plan.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA	12/30/16

OU(s): OU2	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> Insufficient data currently exists to evaluate potential vapor intrusion in the residential area located downgradient of the Site (OU2).			
	<b>Recommendation:</b> Sample wells TW-13, TW-14, TW-19, TW-20, TW-21, and TW-24 to evaluate groundwater concentrations in the vicinity of downgradient residences and to determine if vapor intrusion sampling is warranted.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA	12/30/16

OU(s): OU1	<b>Issue Category: Operations and Maintenance</b>			
	<b>Issue:</b> Vegetation has invaded the drainage channels of the landfill and landfill perimeter fence			
	<b>Recommendation:</b> Conduct maintenance of site vegetation on a regular basis.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	PRP	EPA	6/30/16

OU(s): OU1	<b>Issue Category: Operations and Maintenance</b>			
	<b>Issue:</b> The landfill perimeter fence is damaged along the eastern boundary.			
	<b>Recommendation:</b> Repair the landfill perimeter fence.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA	6/30/16

### Protectiveness Statements

<i>Operable Unit:</i> OU1	<i>Protectiveness Determination:</i> Not Protective	<i>Addendum Due Date (if applicable):</i>
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*Protectiveness Statement:*  
The remedy for OU1 (waste material in the landfill, contaminated soil, NAPL and on-site groundwater) is not protective of human health and the environment in either the short or long-term. The remedy for OU1 is not protective in the short term because construction of the new leachate treatment system is incomplete; the current LTGM Program is insufficient to monitor releases from the Site; contaminated soils and groundwater are present at the toe of the landfill below the leachate interceptor trench system; and because contaminated sediment has not been addressed in the unnamed stream. The remedy for OU1 is not protective in the long-term because an EPA approved O&M plan is not in place, discharge criteria have not been established for the treatment system effluent. For the remedy to be protective in the short and long-term, the following actions need to be taken: complete construction and begin operation of the new leachate treatment system and decommission the old system; revise the LTGM program and incorporate additional wells to adequately monitor releases from the landfill; address sediment contamination in the unnamed stream; prepare an O&M Plan for the new treatment system, landfill cap, drainage channels, fence, monitoring points and all associated remedy components; and establish discharge criteria for the treated effluent that are protective of human health and the environment.

<i>Operable Unit:</i> OU2	<i>Protectiveness Determination:</i> Protectiveness Deferred	<i>Addendum Due Date (if applicable):</i> 12/30/2016
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*Protectiveness Statement:*  
A protectiveness determination of the remedy for OU2 (off-property groundwater, seeps and residential wells) cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions: sample wells TW-19, TW-20, TW-21, and TW-24 as well as TW-13 and TW-14 to evaluate groundwater concentrations off-property and at the property boundary as required by the 2012 LTGM Plan; evaluate on and off-property groundwater data (TW-14 and TW-20) to determine if vapor intrusion sampling is warranted.

### Sitewide Protectiveness Statement

<i>Protectiveness Determination:</i> Not Protective	<i>Addendum Due Date (if applicable):</i> 12/30/2016
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*Protectiveness Statement:*  
Because the remedial action at OU1 is not protective in the short or long-term and the protectiveness cannot be determined for OU2, the Site is not protective of human health and the environment in the short or long-term. The actions listed above for OU1 and OU2 need to be taken to ensure protectiveness.

# **Fourth Five-Year Review Report for Resin Disposal Superfund Site**

## **1.0 Introduction**

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

EPA Region 3, with contractor support from Skeo Solutions, conducted the FYR and prepared this Report regarding the remedy implemented at the Resin Disposal Superfund site (the Site) in Jefferson Hills Borough, Allegheny County, Pennsylvania. EPA conducted this FYR from March to December 2015. EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. The Pennsylvania Department of Environmental Protection (PADEP), as the support agency representing the Commonwealth of Pennsylvania, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the fourth FYR for the Site. The triggering action for this statutory review is the signing of the previous FYR on December 30, 2010. The FYR is required because hazardous substances,

pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of two operable units (OUs). OU1 addresses waste material in the landfill, contaminated soil, non-aqueous phase liquid (NAPL) and on-property groundwater. OU2 addresses off-property groundwater, seeps and residential wells. This FYR report addresses both OUs.

## 2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

**Table 1: Chronology of Site Events**

Event	Date
Pennsylvania Industrial Chemical Corporation (PICCO) disposed of resin-based waste materials in the landfill	1950-1964
Hercules Incorporated (Hercules), the PRP, purchased the PICCO business and facilities	1973
EPA discovered contamination at the Site	April 1, 1979
Various parties conducted environmental investigations at the Site on behalf of the PRP	1980-1984
EPA completed the site investigation (SI)	April 1982
EPA proposed the Site to the Superfund program's National Priorities List (NPL)	December 30, 1982
The PRP installed a leachate collection trench below the lower landfill dike	1983
EPA listed the Site on the NPL	September 8, 1983
The PRP entered into a Consent Order and Agreement with the Pennsylvania Department of Environmental Resources (PADEP) to conduct a remedial investigation/feasibility study (RI/FS). The PRP began the RI/FS for OU1	October 26, 1987
The PRP completed human health and ecological risk assessments	June 15, 1991
EPA approved the RI/FS and issued the Record of Decision (ROD) for OU1 cleanup	June 28, 1991
The PRP began the remedial design (RD) for OU1	May 11, 1992
EPA issued a Consent Decree for OU1 RD and remedial action (RA)	June 10, 1992
The PRP began the RI/FS for off-site groundwater (OU2)	June 24, 1992
The PRP finished the RD for OU1	December 21, 1994
The PRP began the RA for OU1	June 5, 1995
The PRP finished the RI/FS for groundwater; EPA issued the OU2 ROD	September 29, 1995
EPA issued the close-out report for OU1	November 20, 1996
EPA discontinued regular sampling of residential wells	1999
EPA completed the first FYR	September 19, 2000
The PRP implemented institutional controls at the Site	August 2002
EPA deleted the Site from the NPL	October 21, 2003
EPA completed the second FYR	September 21, 2005
The PRP installed an aqueous phase treatment system for the oil/water separator (OWS)	August 2008
EPA completed the third FYR	December 30, 2010
The PRP's contractor discovered a release of untreated leachate upstream of the OWS	March 31, 2011
The PRP's contractor released untreated leachate and product to the West Elizabeth Sanitary Authority (WESA) sewer system	April 15, 2011
An uncontrolled release occurred at the Site. PADEP observed overflow of the aqueous phase pretreatment system at the Site, downstream of the OWS	July 19, 2011
An uncontrolled release occurred at the Site. Untreated liquid from a 55-gallon drum, used as overflow containment for the pretreatment system, was released	August 10, 2011
The PRP conducted a supplemental site investigation	2012-2013
A release from the OWS occurred as result of a major storm event	July 20, 2012
The PRP began the remedial design to upgrade the Site's leachate treatment system	December 1, 2012
EPA required the PRP pay \$2 million in penalties to settle violations of the 1992 CD	July 8, 2013
EPA approved the design for the new leachate pretreatment system	March 24, 2015

## 3.0 Background

### 3.1 Physical Characteristics

The Site is located about one-half mile west of the town of West Elizabeth, between Stilley Street, Maryland Avenue and Circle Glenn Drive in Jefferson Hills Borough, Allegheny County, Pennsylvania (Figure 1). The Site landfill is located at the head of a narrow valley that was formerly strip mined and deep mined for coal. The landfill cap portion of the Site consists of about 2 acres on a 30-acre property. The Site also includes a gravel access road, a landfill perimeter fence, a leachate collection trench, a leachate treatment system and a network of monitoring wells. Recent additions to the Site include concrete foundations for an upgraded leachate treatment system (Figure 2).

The Site is located within the Allegheny Plateau Physiographic Province, in southwestern Pennsylvania. The topography of the area is characterized as an eroded plateau with relatively level highlands, dissected by typically narrow, deeply eroded stream valleys. At the Site, the elevation change between the leachate collection trench on the landfill cap and the new concrete foundations is about 50 feet. The bedrock underlying the area is sedimentary, consisting of interbedded sandstone, shale, siltstone, limestone, and coal. Bedding in these units appears horizontal in outcrop, but is actually gently folded and exhibits dips from one to five degrees in the Site area.

Rocks of the Pennsylvanian age including the Pittsburgh and Casselman Formations are the primary hydrogeologic units of interest in the Site area. The bottom of the resin waste material is at approximately the same elevation as the base of the Pittsburgh Coal Formation. The Pittsburgh Coal is the marker bed for the bottom of the Pittsburgh Formation and has been extensively mined in the area surrounding the Site. The Pittsburgh Coal is the most recognizable geologic unit in the Site area. It occurs at an elevation of approximately 950 feet above mean sea level (msl) in the Site area. The unit is gently folded, and lies within the southwest-plunging Murrysville-Roaring Run Anticline.

The hills surrounding the Site are immediately underlain by a relatively thin (less than 20 feet thick) mantel of clayey soil lying upon rocks of the lower Pittsburgh Formation and the upper Casselman Formation.

Water-bearing units include perched groundwater aquifers found in the shallow, unconsolidated soils around the landfill, in mined and un-mined sections of the Pittsburgh Coal formation, and in perched groundwater within the waste pile of the landfill, and downgradient of the lower landfill dike. Groundwater flow in the unconsolidated soils downslope of the landfill generally parallels the surface topography to the southeast. Groundwater flow in the Pittsburgh Coal formation is generally west.

An unnamed intermittent stream originates in the northeastern portion of the Site and runs downslope through the Site to the southeast, ultimately discharging into the Monongahela River about one-half mile from the Site.

### **3.2 Land and Resource Use**

Jefferson Hills Borough is located in the suburbs of Pittsburgh within the South Hills region. The Site is surrounded by residential areas to the north, south and west, and by undeveloped property to the east. Historically, the land to the east of the Site was extensively slope mined and strip mined for coal. A mobile home community and several residential homes are located about one-quarter mile southeast and downslope of the Site. The town of West Elizabeth, a mixed commercial, industrial and residential area, is located further to the southeast and east.

Groundwater at the Site is not used for drinking water. The Pennsylvania-American Water Company provides public water for residents and businesses in the area. The Monongahela River, located about one-half mile from the Site, is the source for the public water system. Private wells near the Site are still used for washing cars or watering lawns; however, these wells are either located upgradient of the Site or recent sampling in October 2014 has shown they are not impacted by the Site (Test America Analytical Report, dated October 13, 2014). Section 5.0 describes the status of residential wells near the Site and Figure C-7 in Appendix C shows the locations of the residential wells.

Land use in the site area is anticipated to remain the same as current land use. Construction for a larger, upgraded leachate treatment system is currently underway at the Site.

### **3.3 History of Contamination**

Prior to 1950, deep mining and strip mining for coal occurred in the site area. The deep mining resulted in mine voids throughout the Site. At the location of the landfill, coal waste about 20 feet deep was deposited into a mine void.

Between 1950 and 1964, Pennsylvania Industrial Chemical Corporation (PICCO) disposed of an estimated 85,000 tons of production wastes from its resin manufacturing plant into the landfill. The wastes were composed of petroleum and coal-derived chemicals mixed with clay. The primary chemicals of concern (COCs) associated with the wastes were benzene, toluene, ethylbenzene, xylenes (BTEX), styrene, naphthalene, 1,2,4-trimethylbenzene, 1,2,5-trimethylbenzene and 2-methylnaphthalene. The waste, a wet viscous sludge, was dumped down a topographic chute above the landfill. Two earthen dikes contained the waste within the landfill.

After landfill activities ceased, PICCO covered the landfill with 4 to 10 feet of soil. Precipitation and runoff from the surrounding hills ponded on the landfill cover. Some of the water infiltrated the cover and waste materials. The remainder of the water evaporated or ran off to the unnamed stream. Over time, free product and perched groundwater within the landfill migrated to the southeast through the landfill dike into downslope soils and to the southwest within the mine voids of the adjacent Pittsburgh Coal formation.

### **3.4 Initial Response**

Hercules, Inc. (Hercules), a subsidiary of Ashland, Inc., purchased the business and facilities from PICCO in 1973. Hercules, the PRP, never operated at the Site, but initiated site

investigation activities after the discovery of contamination at the landfill in 1979. Investigations conducted by the PRP between 1980 and 1984 found that contaminants had migrated beyond the landfill. EPA completed a site investigation in April 1992. EPA proposed the Site for the Superfund program's National Priorities List (NPL) in December 1982 and finalized the listing in September 1983.

In 1983, the PRP installed a leachate collection trench below the lower landfill dike to collect leachate seepage from the landfill. Liquids in the trench were directed to an oil/water separator (OWS). Initially, the oil was burned at the Hercules Jefferson Plant boiler off site. Beginning in June 2002, the oil was transported off site for recycling. The water from the OWS was discharged to the Jefferson Hills Borough sanitary sewer system and then treated at the West Elizabeth Sanitary Authority (WESA), a publicly-owned treatment works (POTW).

In October 1987, the PRP entered into a Consent Order and Agreement with the Pennsylvania Department of Environmental Resources (PADER), now the Pennsylvania Department of Environmental Protection (PADEP), to conduct a Remedial Investigation/Feasibility Study (RI/FS) for OU1. The PRP conducted the RI/FS between October 1987 and June 1991. The PRP signed a Consent Order with EPA to perform an RI/FS for OU2 in June 1992. The PRP completed a focused RI for OU2 in August 1994 and a focused FS in April 1995.

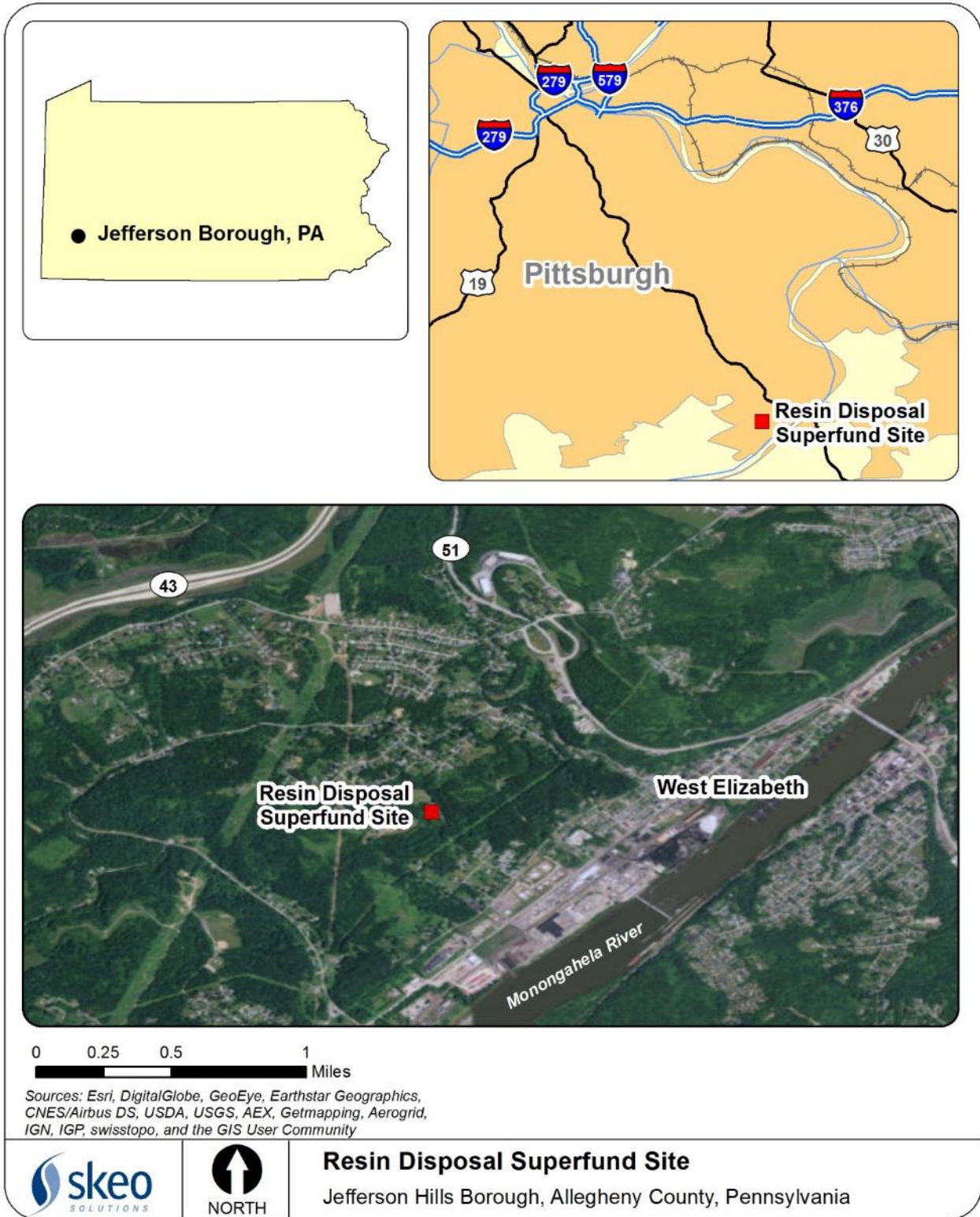
### **3.5 Basis for Taking Action**

Disposal activities at the Site contaminated soil, groundwater, surface water and sediment with chemicals associated with resin production waste, including BTEX, styrene, naphthalene, 1,2,4-trimethylbenzene, 1,2,5-trimethylbenzene and 2-methylnaphthalene. Results of a 1991 human health risk assessment (HHRA) found that the lifetime cancer risk for a future onsite resident based on the most probably exposure concentrations ( $3 \times 10^{-4}$ ) exceeded EPA's risk management range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ . The waste material posed a threat to human health because of risks primarily associated with ingestion of contaminated groundwater by a future resident. The waste also posed a risk to the environment because of the threat of contamination migrating to and adversely impacting the unnamed stream that runs through the Site and slightly impacting the forest ecosystem next to the unnamed stream.

The predominant risk to human health was based on the possibility that a future resident might ingest water contaminated with benzene. Benzene was detected in some of the groundwater monitoring wells above the federal maximum contaminant level (MCL) of the Safe Drinking Water Act (5 micrograms per liter [ $\mu\text{g/L}$ ]).

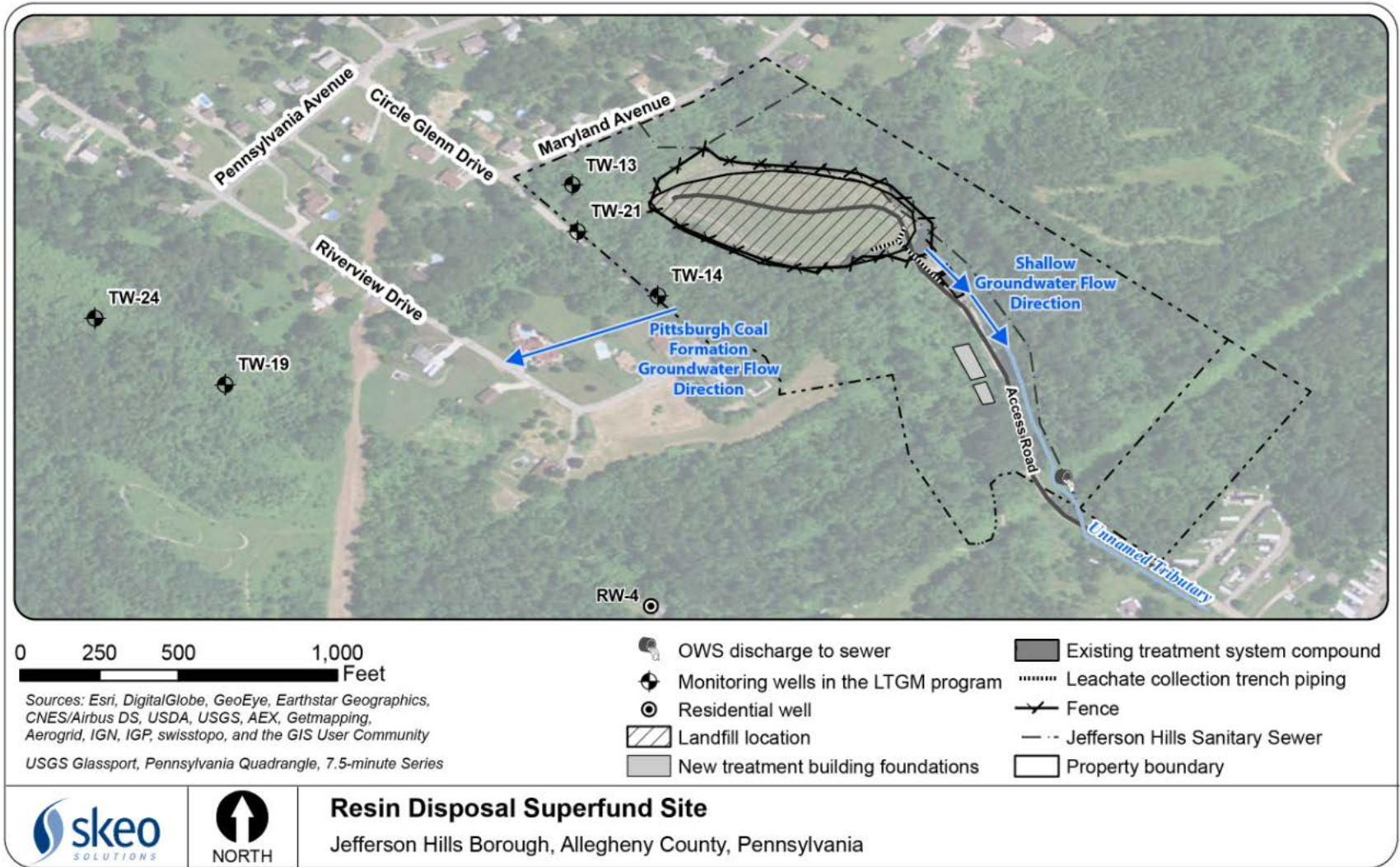


**Figure 1: Site Location Map**



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

**Figure 2: Detailed Site Map**



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site

## 4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP.

### 4.1 Remedy Selection

EPA selected the OU1 remedy in a June 1991 ROD. The primary goal of the remedy was to prevent contaminated groundwater from migrating off property. The ROD did not define specific remedial action objectives (RAOs), but the following RAOs were inferred:

- Prevent ingestion of and dermal exposure to industrial waste, for the industrial workers, trespassers and nearby residents.
- Prevent inhalation of vapors in air above health-based action levels so that Site conditions do not pose an unacceptable risk for the industrial workers, trespassers, and nearby or potential future residents.
- Reduce future migration of chemicals into the bedrock aquifer and mine voids beneath and downgradient of the Site, thus slowly reduce the toxicity, mobility, and volume of waste.
- Reduce surface runoff including storm water and discharge of leachate from the landfill into the unnamed stream that originates at the Site.

The OU1 remedy included the following major components:

- Installation of a multi-layer cap system on the landfill and on the soils between the lower landfill dike and the leachate interceptor trench.
- Upgrades to the lower landfill dike.
- Relocation of the sanitary sewer along the northeast border.
- Installation of infiltration controls to reduce leachate generation.
- Upgrades to the OWS.
- Installation of a skimmer well network to intercept NAPL in the Pittsburgh Coal mine voids.
- Implementation of surface water and groundwater monitoring.
- Institutional controls in the form of deed restrictions and upgrades to site security.

The OU1 ROD did not define specific numeric cleanup goals for site media including soil, groundwater surface water or sediment.

EPA selected the OU2 remedy in a September 1995 ROD. The goal of the remedy was to further reduce the risk to human health and the environment from the Site. The OU2 remedy consisted of no further action with periodic monitoring of off-property monitoring wells, seeps and downgradient residential wells. The ROD required quarterly monitoring for the first three years and semi-annual monitoring thereafter. The risk of ingestion of groundwater from a new well drilled into the Pittsburgh Coal seam was considered unlikely, because a public water supply was and is readily available to residents in the area surrounding the Site. In addition, a future well in the deeper bedrock aquifer in the vicinity of the

Site was also considered unlikely because the bedrock in this area is dry. Periodic monitoring has met the evaluation criteria of protecting human health and the environment. Additionally, the source control measures implemented as required by the OU1 ROD have reduced the presence of groundwater contamination in the Pittsburgh Coal, further reducing the site-related risks in the future.

## **4.2 Remedy Implementation**

### OU1

In 1992, the PRP signed a Consent Decree (1992 CD) to perform the remedial design/remedial action (RD/RA) at the Site. EPA approved the final remedial design (RD) Work Plan in December 1992. EPA approved the final design for the OWS in December 1994 and for the landfill cap and fence in September 1995.

In 1993, the PRP installed four free-product recovery wells along the landfill perimeter. Construction of the landfill cover system began in June 1995 and finished in the fall of 1996. The completed landfill cover system included a low permeability clay liner, geomembrane, a drainage layer and surface drainage channels. The remedial action also included reinforcement of the lower landfill dike, installation of infiltration controls around the perimeter of the landfill to control run on and runoff, installation of a 6-foot high security fence around the perimeter of the landfill, and replacement of the OWS with an upgraded unit.

After considering several options for relocating the sewer line as specified in the ROD, the PRP proposed in the Remedial Design (RD) to leave existing line in place because it was above groundwater and a sewer bedding cutoff line would be installed to insure potential rising groundwater would be diverted to the trench system. EPA inadvertently allowed leaving the sewer line in place when it approved the RD. However, additional documentation of this change may be required in a future decision document if it is determined that the current sewer line location does not impact the remedy.

Surface water sampling from 1991 to 1998 showed that the multi-layer cover and product recovery program resulted in a decrease of Site-related constituents in the unnamed stream to levels at or below MCLs. Regular surface water sampling was discontinued in 1998; however, surface water sampling has been conducted periodically since that time (2010, 2012).

### OU2

The PRP initiated the OU2 groundwater monitoring program in 1997. Monitoring included quarterly sampling of off-property monitoring wells TW-17, TW-18, TW-19 and TW-24, quarterly sampling of three seeps and sampling of residential wells in 1999. Site-related constituents were not detected in seep or residential well samples during the first FYR period. As of the fourth quarter of 1999, concentrations of site-related constituents in off-property monitoring wells were also at or below detection limits. Quarterly sampling of the off-property monitoring wells, seeps and residential wells was discontinued during the second FYR period. Groundwater elevations in the off-property monitoring wells continue to be measured on a quarterly basis. The sampling of off-property wells TW-17, TW-19 and TW-24 prior to preparation of the FYR was required by the 2012 LTGM Plan, but was not implemented as of the writing of this document.

In August 2002, the PRP implemented institutional controls at the Site in the form of a Declaration of Restrictions. Section 6.2 provides further information on the institutional controls.

#### Site Events, Enforcement Actions and Additional Response Actions

In 2002 and 2006, residents of West Elizabeth complained of odor problems in the area, which were attributed to the Site and to the Jefferson Eastman Plant tank farm, located southeast of the Site along the Monongahela River. To address odors potentially originating from the Site, in July 2008, the PRP installed a pretreatment system for the water generated from the OWS. The aqueous phase pretreatment system included an equalization tank, bag filters, organoclay filters and two granulated activated carbon vessels. The PRP discharges the treated aqueous phase of the leachate through the Jefferson Borough sanitary sewer system to the WESA POTW. Discharge criteria have been governed by a series of contractual agreements between WESA and Hercules based on constituent concentration and flow rates. However, before 2008, data to support these agreements were not collected by both the PRP and WESA. The PADEP Clean Water Program regulates discharges of water to the Monongahela River by WESA via a National Pollutant Discharge Elimination System (NPDES) permit. Discharge criteria are currently based a 2006 draft Borough of West Elizabeth Ordinance, which has been incorporated into contractual agreements between WESA and the PRP. PADEP Clean Water requires periodic reporting of VOC concentrations at three points during treatment: Before – influent to OWS; Middle – after OWS treatment and before polishing; and After – after final effluent after polishing.

Between 2008 and 2010, the PRP reported no operational issues or releases of untreated leachate to the ground surface based on sampling of the OWS and aqueous phase pretreatment system. However, multiple releases occurred in 2011 and were reported later, as summarized below:

- March 31, 2011: The PRP's operation and maintenance (O&M) contractor discovered an untreated leachate seep beneath the location where the 6-inch diameter conveyance line from the leachate interceptor trench to the OWS daylights at ground surface, approximately 20 feet upgradient of the OWS.
- April 15, 2011: The PRP's contractor attempted to correct the problems that caused the seep. The contractor released untreated leachate and product to the WESA sewer system. This release resulted in a local hazardous materials (HAZMAT) response, hospitalization of a WESA treatment plant worker and shut-down of the plant for four days. The PRP removed surface soils impacted by the seep and overflows, as well as visually-impacted material from the adjacent unnamed streambed.
- July 19, 2011: A resin-like material was detected at the WESA treatment plant. At the Site, PADEP personnel observed overflow of the aqueous phase pretreatment system, downstream of the OWS. The system had ceased to operate due to a storm-related power loss. The PRP again removed visually-impacted soils around the treatment compound and from the adjacent unnamed streambed and transported eight drums of soil and sediment offsite for disposal. As a temporary measure to address the overflow problem, the contractor piped in a 55-gallon drum to the equalization tank to collect potential overflows.
- August 10, 2011: An increase in naphthalene odors was again detected at the WESA treatment plant. It was determined that a release of untreated liquid from the temporary overflow containment 55-gallon drum had occurred. For a third time, the PRP removed impacted soils in the treatment compound area and along the adjacent unnamed stream, and transported three drums of soil and sediment off site for disposal at an appropriate facility.

EPA issued an Enforcement Letter on December 12, 2011 requiring the PRP to address the releases in accordance with the Emergency Response and Additional Response Actions provisions of the 1992 CD. The letter was hand delivered at a meeting between EPA, the PRPs and PADEP, which was held in Philadelphia at EPA Region 3 Headquarters. In accordance with the Emergency Response provision, the December 2011 Enforcement Letter required the following immediate actions to be performed within 14 days of receipt:

- Installation of large capacity storage tanks to contain high volumes of leachate.
- Supply of a backup power generator for the leachate treatment system.
- Cleaning of the OWS immediately and on a monthly basis.
- Removal of sludge from the leachate treatment system immediately and on a monthly basis.

In accordance with the Additional Response Actions provision, the December 2011 Enforcement Letter also required the submission of a work plan within 60 days of receipt to complete the following additional response actions:

- Upgrading the onsite treatment system to prevent additional releases of leachate.
- Installation of flow meters upstream of the OWS.
- Location and repair of seepage leaks observed in March 2011.
- Assessment and remediation of soil and groundwater contamination resulting from the releases from March through August 2011.
- Operation of the existing leachate treatment system until the upgraded leachate treatment system is installed and operational.
- Operation and maintenance of the upgraded leachate treatment system, when installed.
- Surveying of the manhole at the OWS.

The PRP complied with the immediate actions component of the December 2011 Enforcement Letter and installed supplemental storage for untreated leachate totaling approximately 24,500 gallons. Additionally, a 500-gallon storage tank located between the OWS and the polishing system also takes overflow from the equalization tank in the event the flow exceeds the capacity of the polishing system during high rain events.

As a result of the PRP's failure to notify EPA of the releases that occurred in March, April and July 2011, the PRP paid \$2 million in penalties to settle violations of the 1992 CD. PADEP also issued several Notices of Violation for the incidents.

However, before the additional response actions could be implemented, an additional release from the OWS occurred as result of a major storm event on July 20, 2012. The PRP's contractor recovered material from the ground and adjacent unnamed stream using a vacuum extraction truck. The contractor also excavated visually-impacted surface soils, containerized them in three drums and shipped the drums off site for disposal at an appropriate facility.

On August 9, 2012, EPA issued a second Enforcement Letter to the PRP requiring additional immediate actions in accordance with the Emergency Response provision of the 1992 CD. The following immediate actions were required within 30 days of receipt:

- Mobilization of personnel to the Site in order to monitor the treatment system at the Site when over 0.5 inches of rain was forecast for the area by the National Weather Service. EPA later increased to the requirement for Site mobilization to 0.75 inches of rain in March 2013.
- Installation of a flow meter in the transfer pipe between the storage tanks and leachate collection trench.
- Installation of piezometers to monitor potential for the presence of resin in the vicinity of the Jefferson Hills sewer line and effluent discharge pipe.
- Implementation of a monitoring plan to document surface and subsurface water conditions during storm events.
- Inspection and repair, if necessary, of the effluent discharge line.
- Installation of an onsite rain gauge.

The PRP initiated a supplemental site investigation and additional data collection activities required by the December 2011 and August 2012 Enforcement Letters in late 2012. Supplemental site investigation activities included evaluation of the leachate collection trench, investigation of the Jefferson Hills sewer line, investigation of perimeter groundwater and upgradient Pittsburgh Coal formation groundwater, and investigation of deep soil gas. Additional activities also included an engineering evaluation, a transducer study, stormwater runoff controls evaluation, sewer bedding material evaluation, and evaluation of surface water and sediment in the unnamed stream.

The investigation of the Jefferson Hills sewer line resulted in the detection of a small seep located within a concrete seam of Jefferson Hills manhole 736, located on-Site. In 2014, the PRP replaced manhole 736 with a high density polyethylene manhole and installed a French drain system within the bedding material surrounding the manhole.

The engineering evaluation concluded that the current leachate treatment system is undersized given the significant hydraulic fluctuations experienced at the Site. EPA and the PRP agreed that the leachate treatment system needed to be replaced. In March 2015, EPA approved the design for an upgraded leachate treatment system at the Site. While the treatment technologies will be the same as the old system, the new system is substantially larger and will have capacity to manage up to 50 gallons per minute. The treatment system processing equipment will be separated into two climate-controlled buildings: an “Oil Side” that contains the equipment for separating the oil and aqueous phases and storage for the oil, and a “Water Side” that contains the aqueous phase treatment equipment. Both buildings will have secondary containment and multiple controls systems. Construction for the upgraded system is currently underway and is expected to be completed in 2016. EPA will issue an Explanation of Significant Differences (ESD) to document the changes to the system.

### **4.3 Operation and Maintenance (O&M)**

An O&M Plan was never prepared following construction of the remedy in 1996. In response to the releases in 2011, a draft O&M Plan dated December 5, 2011 was hand delivered to EPA by the PRPs at the December 12, 2011 meeting with EPA and PADEP. EPA sent a comment letter to the PRP on July

10, 2012. However, due to an additional release in July 2012, a final O&M Plan for the current leachate treatment system was never submitted. A revised O&M plan for the new leachate treatment system and Site-wide maintenance activities is required following construction of the new system in 2016.

Although no current O&M Plan exists, the PRP's contractors periodically inspect the landfill cap, surface drainage channels, security fencing and general site conditions during site visits to maintain the OWS. Contractors also mow the landfill cap and dike on an as-needed basis to maintain the vegetative cover. The landfill cover and drainage channels remain in operational condition. Section 6.5 describes additional observations made during the FYR site inspection.

The PRP's contractors regularly monitor the system and provide O&M services for the OWS, including product removal and off-site disposal, and maintenance and sampling of the aqueous phase pretreatment system. As of June 2012, the PRP's new contractor, EHS Support, has been tracking instantaneous leachate production and average light non-aqueous phase liquid (LNAPL) recovery rate. Between May 2012 and November 2014, about 3,200 gallons of oil were collected. Over the same period, the aqueous phase leachate volume was about 1,760,400 gallons.

The PRP's contractors have collected system performance samples from the aqueous phase pretreatment system on an approximately monthly basis since installation of the system in August 2008. The sampling was required by PADEP in 2008. Samples are collected from the influent, mid-point and effluent for analysis of volatile organic compounds (VOCs). Results of influent total VOC analysis presented in the May 2013 Supplemental Investigation Report (SI Report) indicate generally consistent VOC concentrations over time with a slight decrease since about November 2011. The SI Report also indicates that the aqueous phase pretreatment system generally achieves a 98 percent or better total VOC removal efficiency with exceptions noted in June and August 2010 (74 percent and 88 percent, respectively) and February 2012 (91 percent). It is expected that the new aqueous phase pretreatment system under construction will result in continued effective treatment of VOCs prior to discharge.

Currently, discharge criteria for the treatment system are based on a contractual agreement between WESA and the PRP. However, EPA has proposed new criteria which will be protective of human health and the environment. The new aqueous phase pretreatment system has been designed to meet those criteria. EPA will issue an ESD to document the discharge criteria.

## **5.0 Progress Since the Last Five-Year Review**

The protectiveness statement from the 2010 FYR for the Site stated the following:

*A protectiveness determination of the remedy at the Resin Disposal Site cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions:*

*Re-sample all 2010 surface water locations to verify detections of contaminants at SW-1. If detections are verified and results remain above ecological protectiveness levels, then an investigation of contaminant sources should be conducted.*



*Perform maintenance on the potentially contaminated fittings downstream of the oil/water separator carbon treatment system. Sample the Jefferson Hills sewer line at key locations (on-site, upgradient, downgradient, and at on-site sewer intersections) to establish a baseline for the current water quality of the sewer system near the oil/water separator discharge.*

*Update the well survey and document the location of the waterline. If residential wells are in use, EPA recommends collecting samples to ensure their protectiveness.*

*Determine if an unconfined groundwater barrier is present over the former mine area in the Pittsburgh Coal Formation in the vicinity of the residential area to rule out the potential for vapor intrusion.*

*It is expected that these actions can be conducted in the next year and that an Addendum to this Five Year Review will be completed by January 2012, at which time a protectiveness determination will be made. [An addendum to the 3<sup>rd</sup> Five Year Review was never completed due to the uncontrolled releases in 2011 and 2012 and responses to those releases.]*

The 2010 FYR included four issues and recommendations. This report summarizes each recommendation and its current status below.

**Table 2: Progress on Recommendations from the 2010 FYR**

<b>Recommendations</b>	<b>Party Responsible</b>	<b>Milestone Date</b>	<b>Action Taken and Outcome</b>	<b>Date of Action</b>
Resample all surface water locations under similar water flow conditions to verify detections at SW-1. If detections are verified and remain above ecological protection levels, then an investigation of contaminant sources should be conducted.	PRP	05/11/2011	Hercules conducted surface water and sediment sampling of the unnamed stream in August 2012. Surface water results were at or below PADEP Water Quality Criteria for Toxic Substances and EPA Region 3 Biological Technical Assistance Group (BTAG) Freshwater Screening Benchmarks. Sediment results exceeded EPA Region 3 Sediment Screening Benchmarks and/or EPA Region V Ecological Screening Levels (ESLs) for sediment. Sediment excavation is currently planned following construction of the upgraded leachate treatment system.	08/29/2012

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
<p>The OWS pipe fittings have not been replaced. This maintenance should be completed to ensure the OWS is operating properly. In addition, water samples should be collected at strategic on-site locations within the Jefferson Hills sewer line to determine if the Resin Disposal Site is currently contributing to volatile odors in the WESA sewer system.</p>	PRP	06/11/2011	<p>Maintenance on the potentially contaminated fittings downstream of the OWS carbon treatment system was performed in 2012. In addition, leachate flow buffering tanks, an electrical generator and a water polishing system were added to the OWS. A more extensive upgrade to the treatment system, including the addition of climate controlled buildings, is currently underway.</p> <p>An investigation of the Jefferson Hills sewer line was conducted in March 2013. The investigation identified a seep at manhole 736. The PRP replaced this manhole in 2014.</p>	2012
<p>Continue to sample RW-4 on an annual basis to verify detections and to determine if contaminant levels are stable or rising. Conduct an updated well survey to determine the extent of residential well use and determine the extent of public water use on Circle Glen Drive, Maryland Avenue and Riverview Drive. This survey should also include homes downgradient of the contaminated area in the immediate vicinity of the Site. If additional residential wells are found being used, samples should be collected.</p>	PRP	06/11/2011	<p>Residential well RW-4 was not sampled on an annual basis; however, the well was sampled in October 2014. Site-related COCs were not detected.</p> <p>The PRP's contractor obtained a map of areas around the Site served by public water. From a review of the map, it was determined to be inadequate. Therefore, an updated residential well survey is required.</p> <p>The 2012 Revised LTGM Plan states that all but two residences in the site vicinity were connected to public water (RW-4, discussed above, and another residence located 2,300 feet east-northeast and upgradient of the landfill). One additional well (RW-5) was reportedly abandoned and the house was in a state of disrepair. EPA and the PRP determined that the well located east-northeast of the landfill did not require sampling because of its distance and upgradient location relative to the Site.</p>	2012

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
<p>Determine if an unconfined groundwater barrier is present over the former mine area in the Pittsburgh Coal Formation in the vicinity of the residential area to rule out the potential for vapor intrusion.</p>	<p>PRP</p>	<p>06/11/2011</p>	<p>The PRP initiated a deep soil gas investigation/vapor intrusion assessment in November 2012. Ten soil borings were advanced to refusal at bedrock to the east and south of the landfill. Hercules installed soil vapor monitoring points at these locations but was unable to collect samples due to high vacuum conditions and the fine-grained nature of the soils. Hercules proposed modifications to the sampling procedure in an April 2013 technical memorandum but EPA did not approve the modifications. Instead, Hercules evaluated the potential for vapor intrusion using a lines of evidence approach, submitted in the revised Supplemental Investigation Report, dated September 2015.</p> <p>EPA's evaluation of the assessment indicates that there is insufficient data to evaluate the potential for vapor intrusion at this time due to the lack of data from on and off-property monitoring wells. Monitoring wells TW-19, TW-20, TW-21, and TW-24 should be sampled to determine if vapor intrusion sampling is warranted.</p>	<p>2015</p>

## **6.0 Five-Year Review Process**

### **6.1 Administrative Components**

EPA Region 3 initiated the FYR in March 2015 and scheduled its completion for December 2015. EPA remedial project manager (RPM) Robert Wallace led the EPA site review team, which also included EPA site attorney Benjamin Cohan EPA community involvement coordinator (CIC) Trish Taylor and contractor support provided to EPA by Skeo Solutions. In March 2015, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

The Pennsylvania Department of Environmental Protection has contributed to on-going technical reviews and site inspections subsequent to the previous FYR, and has provided input relevant to the current FYR process.

### **6.2 Community Involvement**

On October 26, 2015, EPA published a public notice in the *Daily News* announcing the commencement of the FYR process for the Site, providing contact information for EPA CIC Trish Taylor and inviting community participation. The press notice is available in Appendix B. EPA did not receive any comments as a result of the advertisement. In May 2015, EPA interviewed approximately twelve residents regarding the Site. Findings from the interviews are described in Section 6.6 Interviews.

The final FYR Report will be made available to the public. EPA will place copies of the document in the designated Site repository, the Jefferson Hills Borough Municipal Building, located at 925 Old Clairton Road, Jefferson Hills, Pennsylvania 15025.

### **6.3 Document Review**

This FYR included a review of relevant, site-related documents including the RODs and recent monitoring data. Appendix A includes a complete list of the documents reviewed.

#### ARARs Review

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain “a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment.” The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

*Groundwater*

The 1991 and 1995 RODs established federal MCLs and state drinking water standards under the Pennsylvania Safe Drinking Water Act (35 PS 722.1-721.17 & 25 PA Code Chapter 109) as groundwater ARARs, but the RODs did not provide a list of MCLs or state drinking water standards available at the time. In accordance with the EPA-approved 2012 LTGM Plan, groundwater is monitored for benzene, ethylbenzene, toluene, total xylenes (sum of m-/p-xylene and o-xylene) and naphthalene. Table 3 compares the MCLs used in the monitoring program against the current federal MCLs. Naphthalene does not have an MCL, and therefore under the NCP, its goal should be a risk-based standard [40 CFR 300.430(e)(2)(i)(A)(2)]. See Section 7.2 for evaluation of naphthalene compared to the current risk-based USEPA Regional Screening Level (RSL).

**Table 3: MCL Review for Groundwater COCs Included in LTGM**

COC	LTGM Report MCL (µg/L) <sup>a</sup>	Current Federal MCL (µg/L) <sup>b</sup>	MCL Change
Benzene	5	5	None
Ethylbenzene	700	700	None
Toluene	1,000	1,000	None
Total Xylenes	10,000	10,000	None
Naphthalene	NE	NE	None

*Notes:*

- a. Obtained from Table 3 of the February 2015 PICCO Resins Disposal Site Biannual Groundwater Monitoring and Product Recovery Report
- b. Current federal MCLs were obtained from <http://water.epa.gov/drink/contaminants/index.cfm> (accessed June 16, 2015)

NE – MCL is not established for this contaminant

*Surface Water*

The 1991 and 1995 RODs did not establish chemical-specific ARARs for surface water. However, according to the 2010 FYR, surface water was sampled downstream of the OWS in January 2010 and compared to state surface water standards for the protection of fish and aquatic life. National recommended water quality criteria protective of aquatic life have not been established for the detected compounds; however, national recommended water quality criteria protective of human health have been established for two of the detected compounds (ethylbenzene and toluene). A discussion of surface water and sediment are presented in Appendix C.

Institutional Control Review

On June 22, 2015, Skeo Solutions staff conducted research at the Allegheny County Real Estate website (<http://www2.county.allegheny.pa.us/RealEstate/search.aspxs>) and found property information pertaining to the Site (Table 4). The Site consists of two parcels, both owned by the PRP. The total acreage of the Site parcels (about 30 acres) exceeds parcel acreage reported in the RODs and prior FYRs (26 acres).

**Table 4: Site Property Ownership**

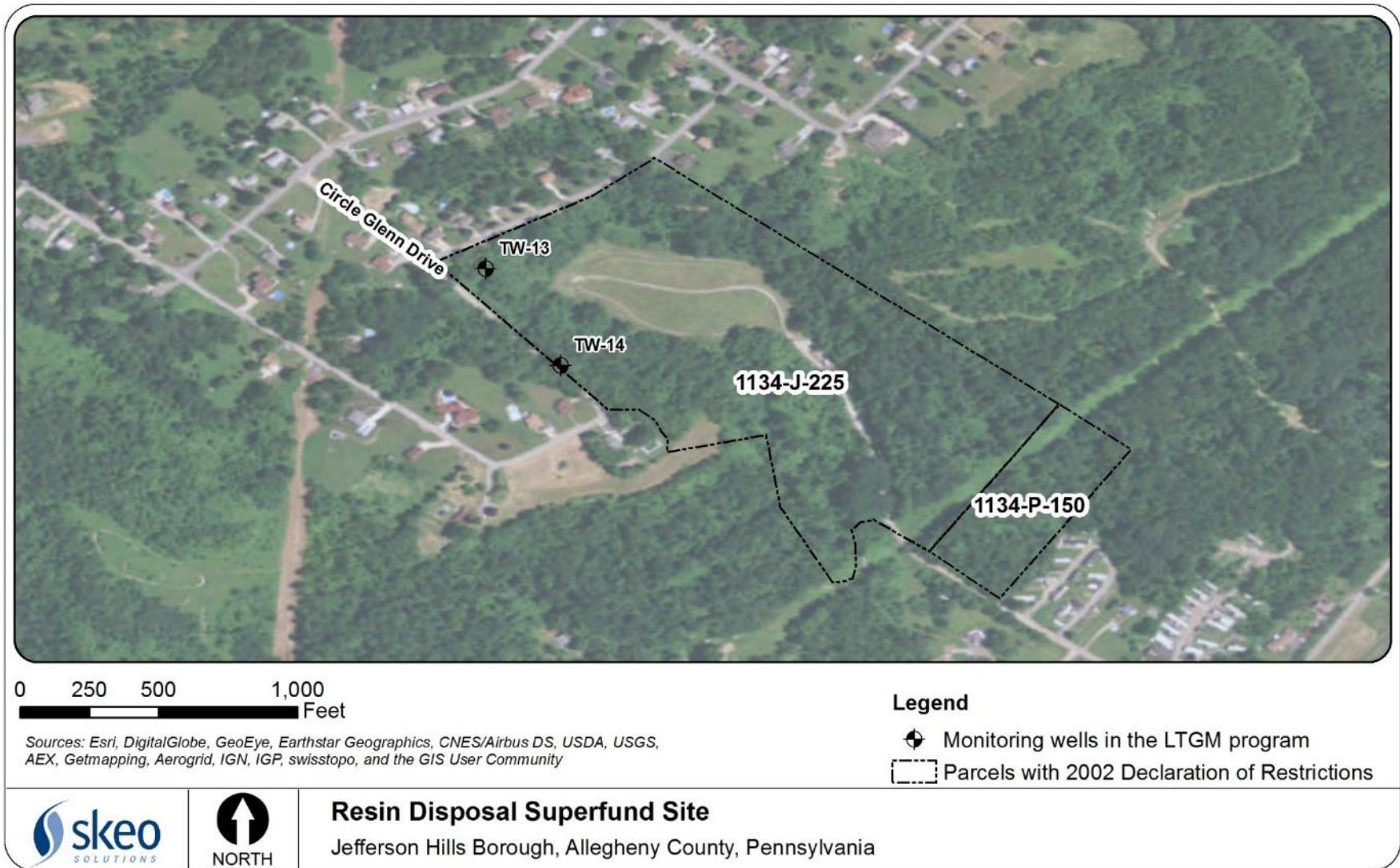
Parcel ID	Lot Area (acres)	Owner	Recording Date
1134-J-225	25.42	Hercules, Inc.	5/31/1973
1134-P-150	4.52	Hercules, Inc.	1/13/1989

On March 19, 2002, the PRP recorded a Declaration of Restrictions in the Office of the Recorder of Deeds of Allegheny County, Pennsylvania for the two parcels owned by the PRP. A copy of the Declaration of Restrictions was included in the 2010 FYR. Table 7 lists the institutional controls associated with areas of interest at the Site. Figure 3 shows the institutional control areas of interest.

**Table 5: Institutional Control (IC) Summary Table**

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Instrument in Place	Notes
On-Site Soil, Surface Water, Groundwater	Yes	Yes	1134-J-225, 1134-P-150	Prohibit construction on the cap or anywhere on the Site that could disturb remedy components or create a risk to human health or the environment; prohibit use of groundwater and surface water; maintain the integrity of the groundwater monitoring wells; restrict site use to commercial or industrial uses	Declaration of Restrictions	Recorded with the Office of the Recorder of Deeds of Allegheny County, Pennsylvania, March 19, 2002

**Figure 3: Institutional Control Base Map**



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

## 6.4 Data Review

This data review incorporates groundwater and LNAPL monitoring data originally presented in the 2013 through 2015 Biannual Groundwater Monitoring Reports, prepared by the PRP's current contractor EHS Support. Prior to 2013, Weavertown Environmental (1997-2011) and Antea Group (2012) prepared the monitoring reports. This FYR also evaluates data presented in the May 2013 SI Report, and residential well sampling data, dated October 2014. Appendix C includes a detailed evaluation of recent data, as well as figures that depict sampling locations discussed in the data review. Figure C-2 of Appendix C shows all groundwater monitoring locations, including those not routinely sampled as part of the LTGM program.

Site contractors conduct LNAPL monitoring and recovery from site wells on a quarterly basis. The long-term LNAPL monitoring and recovery indicated no significant change in LNAPL recovery from wells over the past 20 years. Typically, only well PH-10 contains recoverable LNAPL.

Quarterly groundwater monitoring continues for Pittsburgh Coal formation wells TW-13 and TW-14, the only two wells currently included in the LTGM program (with the exception of select wells that are to be sampled every five years prior to the FYR). Only benzene exceeded the MCL in these wells during the FYR period. Naphthalene, which does not have an MCL, exceeded the EPA tapwater RSL. Benzene, toluene, ethylbenzene and xylenes (BTEX) also exceeded their applicable RSLs during multiple sampling events. Overall, Site COC concentrations in wells TW-13 and TW-14 have declined significantly since baseline sampling, conducted prior to remedy implementation (Appendix C, Table C-1, Figure C-1, and Figure C-2)

Additional investigations outside of the LTGM were conducted during the FYR period in accordance with EPA's December 2011 and August 2012 Enforcement Letters as described in detail in Section 4.2 Remedy Implementation. The results of the investigations are summarized below:

- Soil investigations identified two primary areas of soil impacts: the area downslope of the south leg of the leachate collection trench and the area along the leachate collection conveyance line, both of which may be related to recent releases from the leachate collection and treatment system. The primary Site COCs present in soils are BTEX, styrene, naphthalene and 2-methylnaphthalene. Of these COCs, only ethylbenzene and naphthalene exceeded their respective industrial soil RSLs (Appendix C, Table C-2 and Figure C-3). Additional investigation and remediation of these areas is required by the December 2011 Enforcement Letter. EPA and PADEP are currently reviewing the December 2015 PRP submittal entitled, *Leachate Conveyance Piping Installation And Soil Management Work Plan* that is expected to describe the remediation to be done.
- Supplemental groundwater investigations identified additional areas of groundwater impacts. Benzene, ethylbenzene, styrene, toluene or total xylenes exceeded their applicable MCLs at several of the sample locations and naphthalene, chloroform, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and 2-methylnaphthalene exceeded their



current tapwater RSLs (Appendix C, Table C-3 and Figure C-3). The greatest concentrations were detected at monitoring location SB-11 in the area downslope of the leachate collection trench, and at SB-16 and SB-17, along the leachate collection conveyance line. Groundwater impacts were also observed downgradient of the treatment compound at P-2, but were absent at wells TW-1 and TW-16, located further downgradient (Appendix C, Figure C-2). Groundwater impacts were also observed along the Jefferson Hills sewer line at two piezometers. Impacts to shallow groundwater and soil are currently being evaluated by EPA to determine appropriate response actions. In addition, revisions to the LTGM program are necessary to continue to monitor these impacts.

- Residential well sampling at RW-4, located southwest of the Site (Appendix C, Figure C-5), in October 2014 indicated no site-related contaminants. The 2012 LTGM Plan indicates that all other residential wells are either not in use (RW-5 on Figure C-5 is an abandoned property in a state of disrepair) or are located upgradient of the landfill.
- Sampling of the onsite reach of the unnamed stream in 2012 indicated no surface water impacts to the stream above PADEP Water Quality Criteria for Toxic Substances and/or the EPA Region 3 BTAG Freshwater Screening Benchmarks (Appendix C, Table C-4). Sediment sample results indicated VOCs and 2-methylnaphthalene at concentrations in excess of EPA sediment screening criteria at several sample locations (Appendix C, Table C-5). Sediment impacts are limited to areas within the property boundaries (Appendix C, Figure C-4). EPA is currently reviewing the PRP's June 30, 2014 Sediment Excavation and Stream Restoration Work Plan. The work plan proposes sediment excavation, confirmatory downstream sediment sampling, and stream bank restoration after construction of the new leachate treatment system is complete.
- Soil gas sampling was attempted using soil vapor probes. It was not successful due to the presence of high soil-vacuum conditions as a result of tight native soils above the bedrock contact. Based on the lack of soil gas data, insufficient data currently exists to evaluate the potential for vapor intrusion downgradient from the property. Additional on and off-property groundwater sampling is required to determine if vapor intrusion sampling is necessary.

## **6.5 Site Inspection**

EPA performed the FYR site inspection on May 27, 2015. In attendance were Robert Wallace, EPA RPM; Trish Taylor, EPA CIC; Scott McDougall, PADEP; Chris Mondia, contractor support for the EPA CIC; Mike Dever, Ashland Inc.; Scott Lindenmuth, EHS Support; Ernie Sanchez, Clean Harbors; Norma Ruffing and two additional representatives, Allegheny County Health Department; and Jill Billus and Johnny Zimmerman-Ward, Skeo Solutions. For a full list of site inspection activities, see the Site Inspection Checklist in Appendix D. Site photographs are available in Appendix E.

Site inspection participants met at the Site's locked construction entrance gate, accessed via Stilley Street. Multiple "No Trespassing" signs were posted on the gate. Mr. Ernie Sanchez of

Clean Harbors, the PRP's remedial action contractor, conducted a health and safety tailgate meeting prior to the site inspection.

The site inspection participants then conducted a walkover inspection of the Site, beginning first at the newly constructed concrete foundations for the upgraded leachate treatment system. Mr. Scott Lindenmuth of EHS Support explained that the concrete foundations will house two temperature-controlled treatment system buildings: one for the oil components of the treatment system and the other for the aqueous phase treatment system components and a small office. Site inspection participants observed slumped soils behind the foundations and at a location further north where soil had been reworked during construction activities. Mr. Ernie Sanchez noted that recent rains caused the slumping. Approximately 1,512 tons of mine tailings fill from the slope above the new treatment system were tested, removed and transported to an approved facility to improve slope stability.

Site participants then proceeded to the landfill to observe the condition of the cap and surrounding area. A fence and locked gate restrict access to the landfill. The fence and gate were in adequate condition with some exceptions: several parts of the fence were overgrown with vegetation, and a section of fence along the eastern perimeter was damaged.

Grasses and other plants were well established on the landfill cap. Vegetation was also observed in some of the rip rap drainage channels. EPA noted that the landfill cover should be mowed and the fence line should be treated for invasive species, as needed. The cap was also inspected for settlement and signs of burrowing animals. The group did not identify evidence of settlement or signs of burrowing animals. Mr. Scott Lindenmuth pointed out the location of the leachate collection trench at the base of the landfill and a rain gauge installed near the upgradient portion of the landfill.

Several site inspection participants conducted a walkthrough of the current leachate treatment system facility. A majority of the treatment system, including the OWS, vapor phase granulated activated carbon filters, backup generator and aqueous phase treatment system trailer, is surrounded by a fence with a locked gate. Two large supplemental storage tanks, which store overflow leachate from upstream of the OWS when the isolation valve is closed, are located outside the fenced area. The supplemental tanks and backup generator were installed after the releases in 2011 and 2012; they appeared in good condition. The OWS and piping components, some of which date to 1991 or earlier, are exposed to the elements. Rust and other signs of wear were observed. There is no secondary containment for the OWS and piping.

The aqueous phase treatment system trailer was locked at the time of the site inspection and could not be observed.

During the inspection, the team observed several 55-gallon drums of spent carbon and oil outside the northern end of the current treatment system facility. The drums were staged on a gravel surface and were awaiting off-site disposal and/or recycling. Site participants also observed a small pile of contaminated soil, staged on top of and covered with polyethylene sheeting. Mr. Lindenmuth explained that the soil had been generated during the manhole replacement work.

Several participants also observed the unnamed stream on site, located behind the treatment system facility. Filter socks installed to limit sediment migration were in place in the stream.

EPA conducted a second Site inspection in September 2015 to observe the progress of construction at the Site. Photographs from the September 2015 visit are included in Appendix E.

## **6.6 Interviews**

The FYR process included interviews with parties affected by the Site, including residents living in the immediate vicinity of the Site. The purpose was to document the perceived status of the Site and any perceived problems or successes with the remedy implemented to date.

In May 2015, EPA spoke with approximately twelve residents with most having only general questions and very few issues with the Site. General questions asked by residents during interview related to cleanup funding, timetable of cleanup activities and reuse/redevelopment opportunities. Issues and concerns raised by residents were generally not related directly to EPA's cleanup activities, with the exception of one resident who noted they would like to see EPA hire locally when conducting site remediation. Although not directly related to the Site, the community issues included: illegal dumping on and in the vicinity of the Site, odors emanating from a local power plant in the area and road maintenance issues in the neighborhoods surrounding the Site.

## **7.0 Technical Assessment**

### **7.1 Question A: Is the remedy functioning as intended by the decision documents?**

No. The review of documents, ARARs, risk assumptions, decision documents and the results of the site inspection indicate that the remedy is not functioning as intended by decision documents. A discussion of the remedy for each OU follows.

#### OU1

Several components of the OU1 remedy are not functioning as intended by the decision documents. The low permeability landfill cap limits exposure to waste materials and the leachate collection trench is capturing leachate from the landfill. However, multiple releases occurred at the Site during the past five years as a result of sizing and control systems issues with the leachate treatment system (OWS and aqueous phase treatment system). The releases resulted in shut-down of the WESA water treatment plant, as well as contamination of soil, groundwater and sediment at the Site. An O&M Plan is not currently in place for the current leachate treatment system, which has been modified since 2011 to include the aqueous phase treatment system, as well as overflow tanks, a backup generator and other components for the OWS. Although O&M activities are periodically conducted at the Site, defined procedures and a consistent schedule for implementation of the tasks has not been provided to and approved by EPA.

Several issues were also identified during the FYR site inspection, including slumped soils near construction of the new treatment plant buildings (outside of the landfill boundaries), damage to the perimeter fence, and overgrown vegetation within the landfill drainage channels and on the

perimeter fence. EPA noted that the cap should be mowed and the fence line should be treated for invasive species, as needed.

To address the problems identified with the OU1 remedy, the PRP is constructing an upgraded leachate treatment plant. Once construction is complete, the PRP will submit an O&M Plan for EPA approval for the new treatment system that outlines future O&M tasks, including sampling and disposal procedures, and a schedule for implementation and contingency actions. The O&M Plan will address both the new treatment system as well as the landfill cap, drainage channels, fencing, monitoring points and any other associated remedy components. Once implemented, it is expected that the operating procedures will better maintain the effectiveness of the response actions and ensure long-term protectiveness of the remedy.

Groundwater sampling at the Site identified groundwater contamination above MCLs and RSLs in several areas of the Site, including along the western perimeter of the Site in the Pittsburgh Coal formation, downgradient of the leachate collection trench, along the conveyance line and downgradient of the current treatment system compound. With the exception of wells TW-13 and TW-14 along the western perimeter, the areas of identified impacts are not currently included in the LTGM program. Therefore, the current LTGM program is insufficient to monitor for releases from the property and is not protective of human health or the environment. The long-term LTGM program should be revised to incorporate wells in the southern and southwestern portions of the property to monitor for potential releases.

Institutional controls have been implemented to maintain the integrity of the OU1 remedy components and to restrict use of groundwater at the Site. The fence around the landfill restricts access. No complete exposure pathways to groundwater contaminants currently exist at the Site property. However, as discussed above, the LTGM program is insufficient to evaluate potential complete exposure pathways off-property.

## OU2

The OU2 remedy includes off-property monitoring of groundwater, seeps and residential wells, but much of the required sampling was discontinued after several rounds of sampling did not identify contamination. The 2012 LTGM Plan requires sampling of off-property wells TW-19 and TW-24 prior to the preparation of the FYR. However, this sampling was not completed to date and is identified as an issue. Due to the lack of available data, an evaluation of the protectiveness of the OU2 remedy cannot be made at this time.

The revised LTGM program for OU2 will also incorporate sampling of residential well RW-4 for a comprehensive list of VOCs and SVOCs, in place of the shortened list of indicator parameters in the current program.

## **7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?**

No. There have been changes to exposure assumptions and toxicity data since the remedy was selected, as described in detail below.

### Changes in Exposure Assumptions

Land use at and near the Site has not changed substantially since the last FYR, except for the addition of concrete foundations at the Site for the new leachate treatment system.

During the 2010 FYR, it was determined that a residence next to the Site was using a private well (RW-4), but not for drinking water. To assess current concentrations in the well, the PRP sampled RW-4 in 2014. The only chemicals detected in the primary and duplicate samples were acetone, at 24 µg/L and 22 µg/L, respectively, and 2-butanone at 2.4 µg/L and 1.7 µg/L, respectively. It should be noted that acetone is a known laboratory contaminant. Neither compound is associated with site waste materials; however, to be conservative, the detected concentrations were evaluated in a screening-level risk evaluation (Appendix F, Table F-2). The detected concentrations of acetone and 2-butanone result in a noncancer HI well below 1.0 indicating that the concentrations are currently protective if it were to be used for potable purposes. Continued monitoring is recommended to collect additional data and ensure concentrations do not increase.

The 2012 LTGM Program requires the sampling of monitoring wells TW-19, TW-21, and TW-24 prior to each Five-Year Review. However, this sampling was not performed, therefore, insufficient data currently exists to evaluate Site COC concentrations in groundwater off-property. Additionally, impacted groundwater was identified along the western perimeter of the Site in the Pittsburgh Coal formation, downgradient of the leachate collection trench, along the conveyance line and downgradient of the current treatment system compound. Therefore, the 2012 LTGM Program is insufficient to monitor those areas of the Site and determine if releases from the Site are occurring. Systematic sampling of these areas is necessary to ensure the protectiveness of the remedy in both the short and long-term. Consequently, revisions to the 2012 LTGM Program are warranted.

The 2010 FYR also recommended the PRP perform a vapor intrusion assessment of residences near monitoring wells TW-13 and TW-14. However, soil vapor samples could not be collected due to the presence of high soil-vacuum conditions as a result of tight native soils above the bedrock contact. The PRP prepared an alternative sampling methodology in April 2013, which EPA did not approve. Instead, the PRP evaluated the potential for vapor intrusion using a multiple-lines-of-evidence approach and submitted this assessment in the revised Supplemental Investigation Report, dated September 2015, which is currently being reviewed by EPA and PADEP. However, as noted above, there is insufficient data to evaluate the impact to off-property groundwater. Additional sampling of on and off-property wells is required to determine if vapor intrusion sampling is warranted or if the PRP's multiple-lines-of-evidence evaluation is sufficient.

### Changes in Toxicity Data

Toxicity factors have changed since the original risk assessment, as have risk assessment methods. To evaluate the current and future protectiveness, the following risks were considered:

- Risks from current groundwater concentrations in monitoring wells (using concentrations from the fourth quarter of 2014 [4Q2014]).

- Risks from current groundwater concentrations in a nearby residential well (RW-4).
- Screening-level risks from vapor intrusion.

To estimate current risk at the Site, a screening-level risk evaluation using recent groundwater data and updated toxicity criteria was conducted (Appendix F). If the groundwater was to be used at wells TW-13 and TW-14 (the only two wells included in the current LTGM program), the risk evaluation demonstrates that the risk would exceed the upperbound of EPA's risk management range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  as well as the noncancer threshold hazard index (HI) of 1.0 primarily due to naphthalene (Appendix F, Table F-1). These results indicate that the groundwater monitored in TW-13 and TW-14 would not be protective at current concentrations. However, this water is not currently consumed and institutional controls are in place to prevent the use of this water at the Site.

#### Changes in Cleanup Levels

Decision documents cite MCLs as ARARs for groundwater but do not list specific MCLs in effect at the time of the decision documents. However, current MCLs are used to evaluate monitoring data in the biannual groundwater monitoring reports. The fifth monitored compound, naphthalene, does not have an MCL, and therefore under the NCP, its goal should be a risk-based standard [40 CFR 300.430(e)(2)(i)(A)(2)]. A site-specific cleanup goal for naphthalene in groundwater was not established in decision decisions; however, updated toxicity data for naphthalene are now available and should be considered if a cleanup goal for naphthalene in groundwater is found to be warranted.

### **7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?**

Yes. Recent investigations at the Site identified soil and sediment contamination as a result of releases from the leachate treatment system in 2011 and 2012. EPA and PADEP are currently reviewing the December 10, 2015 PRP work plan to remove contaminated soil along the conveyance line and leachate treatment system. Investigation of impacts within the current leachate treatment system compound and between the compound and the unnamed stream where releases occurred during this FYR period will be conducted and if soil contamination is identified, it will be addressed in a future response action. In addition, the EPA and PADEP are currently reviewing the June 30, 2014 PRP work plan to excavate sediment and perform stream restoration following construction of the new leachate treatment system. The work plan also includes additional sampling of downstream sediment prior to the sediment excavation to ensure that contaminants have not migrated further downstream since the initial sampling was conducted.

### **7.4 Technical Assessment Summary**

The FYR indicates that the Site remedy is not functioning as intended by Site decision documents. Multiple releases have occurred at the Site as a result of an undersized leachate treatment system. The releases resulted in shut-down of the WESA water treatment plant, as well as contamination of soil, groundwater and sediment at the Site. The PRP is currently constructing an upgraded leachate treatment plant that is expected to resolve many of the issues that have

been identified during this FYR period. An updated O&M Plan will be prepared for EPA approval to address both the new treatment system, as well as the landfill cap, drainage channels, fence, monitoring points and any other associated remedy components. Once implemented, it is expected that the operating procedures will better maintain the effectiveness of the response actions and provide long-term protectiveness of the remedy.

The PRP will also investigate and address any impacts within the current treatment system compound and between the compound and the unnamed stream where releases occurred during this FYR period. Additional sampling of downstream sediment will also be conducted prior to the planned sediment excavation to ensure that contaminants have not migrated further downstream.

The PRP will revise the LTGM Program for EPA approval to ensure that the southern downgradient areas are monitored on a regular basis to determine if releases are occurring at the Site. Residential well sampling at RW-4 should also be incorporated into the LTGM program for the next FYR. Additional groundwater monitoring is also required to determine if vapor intrusion sampling is necessary in the residential area downgradient of the Site.

## 8.0 Issues

Table 6 summarizes the current site issues.

**Table 6: Current Site Issues**

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
The current leachate treatment system is undersized as evidenced by the significant hydraulic fluctuations experienced at the Site, which has resulted in multiple releases during the FYR period (OU1).	Yes	Yes
There are no discharge criteria for discharge of treated effluent into the sanitary sewer system (OU1).	No	Yes
An EPA-approved O&M Plan for the Site is not in place (OU1).	No	Yes
Contaminated soil and groundwater are present at the toe of the landfill below the trench system as a result of the 2011 and 2012 releases.	Yes	Yes
The current LTGM program is inadequate to monitor releases from the landfill and other areas of the Site (OU1).	Yes	Yes
Additional response actions may be necessary to address contaminated media at the Site resulting from remedy performance issues and to ensure long-term protectiveness of the remedy.	No	Yes
Sediment in the unnamed stream is impacted as a result of the 2011 and 2012 releases (OU1).	Yes	Yes
Sampling of off-property wells TW-19 and TW-24 and perimeter well TW-21 prior to the FYR, as required by the 2012 LTGM Plan, was not conducted. It is unknown if groundwater contamination has migrated off-property to the west in the Pittsburgh Coal formation (OU1/OU2).	Yes	Yes
Insufficient data currently exists to evaluate potential vapor intrusion in the residential area located downgradient of the Site (OU2).	Yes	Yes
Vegetation has invaded the drainage channels of the landfill and landfill perimeter fence (OU1).	No	Yes
The landfill perimeter fence is damaged along the eastern boundary (OU1).	No	Yes

The following additional items, though not expected to affect protectiveness, warrant additional follow up:

- Relocation of the portion of the sewer line that is below the landfill cap was required by the ROD but was never performed. EPA inadvertently allowed leaving the sewer line in place. A future decision document may be necessary to document this change to the remedy if it is determined that the current sewer line location will not adversely impact the remedy.
- Institutional controls have not been implemented at properties downgradient of site groundwater contamination (e.g., west of Circle Glenn Drive). Additional institutional controls may be needed to restrict groundwater use in the areas downgradient of wells TW-13 and TW-14, both of which recently reported benzene above its MCL (see Section 6.4).
- Conduct an updated well survey to determine the extent of residential well use and determine the extent of public water use on Circle Glen Drive, Maryland Avenue and Riverview Drive. This survey should also include homes downgradient of the contaminated area in the immediate vicinity of the Site. If additional residential wells are found being used, samples should be collected.

## 9.0 Recommendations and Follow-up Actions

Table 7 provides recommendations to address the current site issues.

**Table 7: Recommendations to Address Current Site Issues**

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
The current leachate treatment system is undersized as evidenced by the significant hydraulic fluctuations experienced at the Site, which has resulted in multiple releases during the FYR period (OU1).	Complete construction and begin operation of the new leachate treatment system and decommission the old system. This action is required by the December 2011 Enforcement Letter pursuant to the June 1992 CD. EPA will document these modifications in an ESD.	PRP	EPA	12/30/2016	Yes	Yes



Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
There are no EPA required discharge criteria for discharge of treated effluent into the sanitary sewer system (OU1).	Establish discharge criteria for the treated effluent that are protective of human health and the environment and document that criteria in an ESD.	PRP	EPA	12/30/2016	No	Yes
An EPA-approved O&M Plan for the Site is not in place. (OU1).	Prepare an O&M Plan for the new treatment system, landfill cap, drainage channels, fence, monitoring points and all associated remedy components.	PRP	EPA	12/30/2016	Yes	Yes
Contaminated soil and groundwater are present at the toe of the landfill below the leachate trench system as a result of the 2011 and 2012 releases	Evaluate if response actions are warranted to address the soil and groundwater contamination. This action is required by the December 2011 Enforcement Letter pursuant to the June 1992 CD.	EPA	EPA	12/30/2016	Yes	Yes
The current LTGM program is inadequate to monitor potential releases from the landfill and other areas of the Site (OU1).	Re-evaluate the LTGM program and incorporate additional existing and/or new wells to adequately monitor potential contaminant migration from the landfill and other areas of the Site. Residential well RW-4 should be sampled prior to the next FYR. All groundwater samples should be analyzed for the full suite of VOCs and SVOCs. This action is required by the December 2011 and August 2012 Enforcement Letters pursuant to the June 1992 CD.	PRP	EPA	12/30/2016	Yes	Yes

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Additional response actions may be necessary to address contaminated media at the Site resulting from remedy performance issues and to ensure long-term protectiveness of the remedy.	Evaluate if additional enforcement actions or a decision document are necessary to require the performance of the additional response actions.	EPA	EPA	12/30/2016	No	Yes
Sediment in the unnamed stream is impacted as a result of the 2011 and 2012 releases (OU1).	Evaluate response actions to address contaminated sediment in the unnamed stream. This action is required by the December 2011 Enforcement Letter pursuant to the June 1992 CD.	PRP	EPA	6/30/2016	Yes	Yes
Sampling of off-property wells TW-19 and TW-24 and perimeter well TW-21 prior to the FYR, as required by the 2012 LTGM Plan, was not conducted. It is unknown if groundwater contamination has migrated off-property to the west in the Pittsburgh Coal formation (OU1/OU2).	Sample wells TW-19, TW-21 and TW-24 to evaluate groundwater concentrations off-property and at the property perimeter as required by the 2012 LTGM Plan.	PRP	EPA	12/30/2016	Yes	Yes

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Insufficient data currently exists to evaluate potential vapor intrusion in the residential area located downgradient of the Site (OU2).	Sample wells TW-13, TW-14, TW-19, TW-20, TW-21, and TW-24 to evaluate groundwater concentrations in the vicinity of downgradient residences and to determine if vapor intrusion sampling is warranted.	PRP	EPA	12/30/2016	Yes	Yes
Vegetation has invaded the drainage channels of the landfill and landfill perimeter fence (OU1).	Conduct maintenance of site vegetation on a regular basis.	PRP	EPA	6/30/2016	No	No
The landfill perimeter fence is damaged along the eastern boundary (OU1).	Repair the landfill perimeter fence.	PRP	EPA	6/30/2016	No	Yes

## 10.0 Protectiveness Statements

### OU1

The remedy for OU1 (waste material in the landfill, contaminated soil, NAPL and on-site groundwater) is not protective of human health and the environment in either the short or long-term. The remedy for OU1 is not protective in the short term because construction of the new leachate treatment system is incomplete; the current LTGM Program is insufficient to monitor releases from the Site; contaminated soils and groundwater are present at the toe of the landfill below the trench system; and because contaminated sediment has not been addressed in the unnamed stream. The remedy for OU1 is not protective in the long-term because a current O&M plan is not in place, discharge criteria have not been established for the treatment system effluent, and the Site fence is damaged along the eastern boundary of the property. For the remedy to be protective in the short and long-term, the following actions need to be taken:

- Complete construction and begin operation of the new leachate treatment system and decommission the old system.
- Revise the LTGM program and incorporate additional wells to adequately monitor releases from the landfill.
- Complete sediment excavation and stream restoration in the unnamed stream.
- Prepare an O&M Plan for the new treatment system, landfill cap, drainage channels, fence, monitoring points and all associated remedy components.

- Establish discharge criteria for the treated effluent that are protective of human health and the environment and document the discharge criteria in an ESD.
- Repair the landfill perimeter fence.

### OU2

A protectiveness determination of the remedy for OU2 (off-property groundwater, seeps and residential wells) cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions:

- Sample wells TW-19, TW-20, TW-21, and TW-24 as well as TW-13 and TW-14 to evaluate groundwater concentrations off-property and at the property boundary as required by the 2012 LTGM Plan.
- Evaluate on and off-property groundwater data to determine if vapor intrusion sampling is necessary.

### Sitewide

Because the remedial action at OU1 is not protective in the short or long-term and the protectiveness cannot be determined for OU2, the Site is not protective of human health and the environment in the short or long-term. The actions listed above for OU1 and OU2 need to be taken to ensure protectiveness.

### **11.0 Next Review**

The next FYR is due within five years of the signature/approval date of this FYR.

## **Appendix A: List of Documents Reviewed**

100% Design for New Leachate Pretreatment System, Former PICCO Landfill. Prepared by EHS Support. December 2014. Revised April 2015.

Agreement on Stipulated Penalties, United States of America v. Hercules, Inc. United States District Court Western District of Pennsylvania. Civil Action No. 92-1027. July 8, 2013.

Five-Year Review Report, Resin Disposal Superfund Site, Allegheny County, Pennsylvania. Prepared by USEPA, Region 3. September 19, 2000.

PICCO Resins Disposal – Replacement of Manhole 736 and Installation of French Drain System, technical Memorandum from Scott Lindenmuth, EHS Support to Robert Wallace, Jr., USEPA. December 20, 2013.

PICCO Resins Disposal Site, Biannual Groundwater Monitoring and Product Recovery Report. Prepared by EHS Support. February 2013.

PICCO Resins Disposal Site, Biannual Groundwater Monitoring and Product Recovery Report. Prepared by EHS Support. February 2014.

PICCO Resins Disposal Site, Biannual Groundwater Monitoring and Product Recovery Report. Prepared by EHS Support. February 2015.

Proposed Modification to Soil Vapor Probe Sampling Procedures. Memorandum from Greg White, EHS Support, to Rob Wallace, USEPA. April 18, 2013.

Record of Decision, Resin Disposal Site. Prepared by USEPA Region 3. June 28, 1991.

Record of Decision, Resin Disposal Site, Operable Unit #2, Prepared by USEPA Region 3. September 29, 1995.

Revised Long-term Groundwater Monitoring Plan, PICCO Resin Disposal Site, Jefferson Hills Borough, Pennsylvania. Prepared by Cummings Riter Consultants, Inc. April 13, 2012.

Second Five-Year Review Report for Resin Disposal Site, Jefferson Borough, Allegheny County, Pennsylvania. Prepared by USEPA Region 3. August 2005.

Sediment Excavation and Stream Restoration Work Plan. Prepared by EHS Support. June 30, 2014.

Supplemental Investigation Report, PICCO Resins Disposal, Jefferson Hills, Pennsylvania. Prepared by EHS Support. May 2013.

Third Five-Year Review Report for Resin Disposal Site, Jefferson Borough, Allegheny County, Pennsylvania. Prepared by USEPA Region 3. December 30, 2010.

## EPA Reviews Cleanup Resin Disposal Superfund Site

The U.S. Environmental Protection Agency (EPA) is conducting a fourth Five-Year Review of the Resin Disposal Superfund Site located in Jefferson Borough, Allegheny County. EPA inspects sites regularly to ensure that cleanups conducted remain fully protective of public health and the environment. Prior reviews have determined the cleanup remedy is protective. The results of this review will be available by the close of December 2015.

**To access results of the review (late Dec. 2015):**

<http://epa.gov/5yr>

**To learn detailed site and contact information:**

<http://go.usa.gov/36ySk>

**To listen to a podcast about EPA Five-Year Reviews:**

<http://go.usa.gov/3FRBY>

**To ask questions or provide site information:**

**Contact:** Trish Taylor **Phone:** 215-814-5539

**Email:** [taylor.trish@epa.gov](mailto:taylor.trish@epa.gov)

## Appendix C: Data Review

### Long-term LNAPL Monitoring and Recovery

Site contractors conduct LNAPL monitoring and recovery from site wells on a quarterly basis. No product was recovered between 1999 and 2011. Product recovery rates have increased since 2012 with annual recovery of 0.6 gallons in 2012, 2.94 gallons in 2013 and 1.77 gallons in 2014. The increase in recovery volumes may be due to contractor measurement and recovery methods rather than a significant increase in NAPL. The Biannual Groundwater Monitoring Report for the second half of 2014 indicates that cumulative product recovery from wells over 20 years of monitoring (1994 to 2014) is about 194 gallons, with the majority of the amount recovered prior to 1999. Only well PH-10 typically contains recoverable LNAPL.

### Long-term Groundwater Monitoring

Site contractors sample groundwater from two wells screened in the Pittsburgh Coal formation (TW-13 and TW-14) on a quarterly basis. Samples are analyzed for indicator parameters BTEX and naphthalene. The number of wells included in long-term monitoring was reduced in 2000, with EPA concurrence, after eight quarters of sampling data showed minimal or no impacts to most of the Pittsburgh Coal formation wells. TW-13 and TW-14 were selected for continued sampling because they were the only two wells containing detections above MCLs. TW-14 was not sampled prior to 2012 due to the presence of NAPL in the well. The 2012 LTGM Plan also requires sampling of off-property wells TW-19 and TW-24 and perimeter well TW-21 every five years prior to the FYR to evaluate groundwater concentrations off-property and at the Site perimeter. No recent sampling data from these wells was available for review.

During the FYR period, benzene was the only COC that exceeded its MCL of 5 µg/L in TW-13 and TW-14. Benzene at TW-13 slightly exceeded its MCL twice during the review period (6.5 µg/L during fourth quarter 2012 [4Q2012] and 5.1 µg/L during 1Q2013). Benzene at TW-14 consistently exceeded its MCL with concentrations ranging from 9.5 to 29 µg/L. Concentrations are relatively stable at TW-14 with a slight increase noted between 3Q2014 and 4Q2014. Appendix C includes a summary of the analytical data from 2010-2014 and time-concentration graphs for TW-13 and TW-14.

An MCL has not been established for naphthalene; therefore, this FYR compares detected concentrations for this constituent to the current EPA tapwater RSL of 0.17 µg/L. Naphthalene at TW-13 and TW-14 exceeded the RSL during a majority of the sampling events, with concentrations ranging from non-detect to 55 µg/L at TW-13 and from 320 µg/L to 1,300 µg/L at TW-14. Naphthalene concentrations at TW-13 show an increase in concentration between 2010 and 2012; however, since 2012, concentrations have fluctuated. Naphthalene at TW-14 show a

generally downward trend during the FYR period. Overall, COC concentrations have declined significantly since baseline sampling conducted prior to remedy implementation.

Benzene, toluene, ethylbenzene and xylenes also exceeded their applicable RSLs during multiple sampling events.

### Additional Investigation Efforts

During the FYR period, additional data were collected at the Site for supplemental investigations including an engineering evaluation in support of an upgrade to the treatment system, an evaluation of the Jefferson Hills sewer line and an evaluation of surface water and sediment in the unnamed stream onsite. A summary of the data collected for these studies is included below. Data from these investigations, with the exception of the residential well data, is addressed in detail in the May 2013 SI Report.

#### *Soil*

Based on soil samples collected in 2012 and 2013, the primary Site COCs present in soils are BTEX, styrene, naphthalene and 2-methylnaphthalene. Of these COCs, only ethylbenzene and naphthalene exceeded their respective industrial soil RSLs. Appendix C, Table C-2 includes a summary of the soil analytical results compared to the RSLs current at the time of the supplemental investigation. Figure C-4 shows the locations of the detections. Some RSLs have changed since that time, including those for benzene (current industrial RSL of 5,100 micrograms per kilogram [ $\mu\text{g}/\text{kg}$ ]), ethylbenzene (25,000  $\mu\text{g}/\text{kg}$ ), styrene (3,500,000  $\mu\text{g}/\text{kg}$ ) and naphthalene (17,000  $\mu\text{g}/\text{kg}$ ), but the changes do not result in additional detections above RSLs. The distribution of soil exceedances is limited to two primary areas: the area downslope of the south leg of the leachate collection trench (SB-2, -9, -10, -11) and the area along the leachate collection conveyance line (SB-8, -16, -17). The SI Report notes that the PRP will address the impacts along the conveyance line during installation of the upgraded treatment system and decommissioning of the current system. The PRP should also investigate and remediate, if necessary, any impacts within the current treatment system compound and between the compound and the unnamed stream where releases occurred during this FYR period.

#### *Groundwater*

As part of supplemental investigation efforts, groundwater samples were collected from newly installed wells/piezometers and existing wells upgradient and downgradient of the landfill, immediately upgradient and downgradient of the leachate collection trench, along the Jefferson Hills sewer line and within the Pittsburgh Coal formation. Benzene, ethylbenzene, styrene, toluene or total xylenes exceeded their applicable MCLs and RSLs at several of the sample locations (Appendix C, Table C-3 and Figure C-5) and naphthalene, chloroform, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and 2-methylnaphthalene exceeded their current tapwater RSLs. Since Table C-3 is an excerpt from a PRP-prepared report, it does not include the RSLs. However, detected concentrations were reviewed against the current RSLs as part of this FYR. The greatest concentrations were detected at monitoring location SB-11 in the area downslope of the leachate collection trench, and at SB-16 and SB-17, along the leachate collection conveyance line. Benzene concentrations in this area were detected up to 790  $\mu\text{g}/\text{L}$  (SB-11). Groundwater impacts were also observed downgradient of the treatment compound at



P-2, but were absent at wells TW-1 and TW-16, located further downgradient. The absence of COCs in TW-1 and TW-16 suggests the area of impact is delineated to the south in the unconsolidated unit; however, long-term monitoring of this area should be instituted to monitor potential plume migration and attenuation over time.

Groundwater impacts were also observed along the Jefferson Hills sewer line at two piezometers (locations C and E). Detections above screening criteria include but are not limited to benzene at location C (C-GW-12) at 280 µg/L (compared to the MCL of 5 µg/L) and naphthalene at 9,700 µg/L (compared to its RSL of 0.17 µg/L).

Detection limits for certain chemicals (e.g., chloroform) were also found to be much greater than their corresponding RSLs. Future sampling should ensure that detection limits are below RSLs.

#### *Residential Well Sampling*

Sampling of residential well RW-4 occurred in October 2014 for VOCs and SVOCs. Acetone and 2-butanone (methyl ethyl ketone) were the only constituents detected in the sample and neither constituent is considered site-related. Acetone was detected at an estimated (J) concentration of 24J µg/l, well below its tapwater RSL of 14,000 µg/l, and 2-butanone was detected at an estimated concentration of 2.4J µg/l below its tapwater RSL of 5,600 µg/L. In contrast, residential well sampling in 2010 for the prior FYR reported low-level detections of site-related constituents (naphthalene at 11 µg/L; 1,2,4-trimethylbenzene at 0.77J µg/L and total xylenes at 0.42 J µg/L) in RW-4. Although the current results for RW-4 are below risk-based criteria, residential well monitoring is recommended for the next Five Year Review due to the historic detections of site-related constituents at RW-4.

#### *Surface Water and Sediment*

In August 2012, surface water and sediment from the unnamed stream were sampled following a July 2012 release from the leachate treatment system. The PRP collected surface water and sediment samples from the unnamed stream on the Site in August 2012. Appendix C includes a figure (Figure C-6) that shows the surface water and sediment sampling locations. Sampling results indicated no surface water impacts to the unnamed stream above PADEP Water Quality Criteria for Toxic Substances or the EPA Region 3 BTAG Freshwater Screening Benchmarks (Table C-4 of Appendix C).

### **Table 5: Evaluation of Surface Water Standards Used in the 2012 Sampling Event**

#### *Sediment*

The 1991 and 1995 RODs did not identify COCs in sediment. Therefore, chemical-specific ARARs were not established for the medium. Due to a release in 2012, sediment in the unnamed stream was sampled in August 2012. Results were compared to health-based screening levels because chemical-specific ARARs are not available for sediment. Regulatory criteria have not been established for sediment since 2012. Sediment sample results indicated VOCs and 2-methylnaphthalene at concentrations in excess of EPA sediment screening criteria at several sample locations (Table C-5 of Appendix C). Sediment impacts are limited to areas within Site property boundaries. The PRP plans to conduct sediment excavation, confirmatory downstream sediment sampling and streambank restoration after construction of the new leachate treatment

system is complete. Sediment stabilization measures are currently in place to retain and collect sediment during construction activities at the Site (e.g., filter socks were placed in the streambed).

### *Soil Gas*

The PRP initiated a deep soil gas investigation in 2012 to evaluate the potential occurrence of soil gas associated with dissolved-phase and sorbed-phase VOCs present within the landfill materials and former mine area. Hercules advanced 10 borings around the downgradient perimeter of the landfill (SG-1 through SG-10) to refusal at the bedrock contact (between 9 and 22 feet bgs) and converted the borings to soil vapor probes. Soil vapor sampling was attempted at the vapor probe locations, but samples were not collected due to the presence of high soil-vacuum conditions as a result of tight native soils above the bedrock contact. The PRP proposed an alternative method for sampling, but EPA did not approve the methodology. Instead, Hercules evaluated the potential for vapor intrusion using a multiple lines of evidence approach and submitted this evaluation in the revised Supplemental Site Investigation Report, dated September 2015. As noted above, off-property groundwater monitoring wells were not sampled at the time of the FYR as required by the LTGM Program. Therefore, there is insufficient data to evaluate the impact to off-property groundwater. Additional sampling of on and off-property wells is necessary to determine if vapor intrusion sampling is necessary.

**Table C-1: Long-term Groundwater Monitoring Data (Wells TW-13 and TW-14)**

Monitoring Well ID	Date	Benzene	Toluene	Ethyl-benzene	m-/p-Xylene	o-Xylene	Naphthalene
MCL <sup>a</sup>		5	1,000	700	10,000 (total)	10,000 (total)	NA
EPA Tapwater RSL <sup>b</sup>		0.45	110	1.5	19	19	0.17
TW-13	1990	ND	18J	<b>23J</b>	<b>58<sup>c</sup></b>		<b>490</b>
	1993 <sup>d</sup>	<b>7J</b>	10	<b>69</b>	<b>260J<sup>c</sup></b>		<b>380</b>
	1Q2010 <sup>e</sup>	<b>1.1</b>	<1.0	<b>3.9</b>	<2.0	1.5	<b>18</b>
	2Q2010	<b>&lt;1.0</b>	<1.0	<b>1.7</b>	<2.0	<1.0	<b>&lt;5.0</b>
	3Q2010	<b>&lt;1.0</b>	<1.0	<b>2.1</b>	<2.0	1	<b>7.8</b>
	4Q2010	<b>1.3</b>	<1.0	<b>1.9</b>	<2.0	4.8	<b>7.7</b>
	1Q2011	<b>&lt;1.0</b>	<1.0	<1.0	<2.0	<1.0	<b>&lt;5.0</b>
	2Q2011	<b>&lt;1.0</b>	<1.0	<1.0	<2.0	<1.0	<b>&lt;5.0</b>
	3Q2011	<b>&lt;1.0</b>	<1.0	<1.0	<2.0	1.2	<b>&lt;5.0</b>
	4Q2011	<b>&lt;1.0</b>	<1.0	<1.0	<2.0	<1.0	<b>&lt;5.0</b>
	1Q2012	<b>&lt;1.0</b>	<1.0	<1.0	<1.0	<2.0	<b>6.2</b>
	2Q2012	<b>&lt;1.0</b>	<1.0	<b>8.8</b>	3.3	6.3	<b>55</b>
	3Q2012	<b>&lt;1.0</b>	<1.0	<b>7.1</b>	2.8	4.5	<b>43</b>
	4Q2012	<b>6.5</b>	<1.0	<b>8.7</b>	<2.0	6	<b>20</b>
	1Q2013	<b>5.1</b>	<1.0	<b>16</b>	<2.0	2.1	<b>27</b>
	2Q2013	<b>4.5</b>	<1.0	<b>7.1</b>	<2.0	1.9	<b>5.1</b>
	3Q2013	<b>&lt;1.0</b>	<1.0	<b>5.9</b>	2.7	3.7	<b>31</b>
	4Q2013	<b>1.6</b>	<1.0	<b>2.1</b>	<2.0	1.8	<b>6.6</b>
	1Q2014	<b>2</b>	<1.0	<b>3.4</b>	<2.0	1.8	<b>13</b>
	2Q2014	<b>2.6</b>	<1.0	<b>6.2</b>	3.7	4.2	<b>40</b>
3Q2014	<b>&lt;1.0</b>	<1.0	1.1	<2.0	<1.0	<b>&lt;5.0</b>	
4Q2014	<b>&lt;1.0</b>	<1.0	<1.0	<b>&lt;2.0<sup>c</sup></b>		<b>35</b>	
TW-14	1990	<b>110J</b>	<b>740</b>	<b>4,300</b>	<b>3,000<sup>c</sup></b>		<b>110,000</b>
	1993	<b>&lt;250</b>	90J	<b>140J</b>	<b>4,400<sup>c</sup></b>		<b>6,000</b>
	1Q2010	Not sampled due to presence of LNAPL					
	2Q2010						
	3Q2010						
	4Q2010						
	1Q2011						
	2Q2011						
	3Q2011						
	4Q2011						
	1Q2012	<b>24</b>	<10	<b>92</b>	35	<b>93</b>	<b>1,300</b>
	2Q2012	<b>22</b>	<10	<b>85</b>	22	<b>67</b>	<b>1,200</b>
	3Q2012	<b>16</b>	<10	<b>75</b>	24	<b>66</b>	<b>1,000</b>
	4Q2012	<b>20</b>	<10	<b>88</b>	33	<b>90</b>	<b>1,000</b>
	1Q2013	<b>20</b>	<10	<b>64</b>	20	<b>80</b>	<b>630</b>
	2Q2013	<b>19</b>	<5	<b>74</b>	12	<b>56</b>	<b>808</b>
	3Q2013	<b>18</b>	<5	<b>65</b>	12	<b>44</b>	<b>480</b>
4Q2013	<b>12</b>	5.2	<b>55</b>	11	<b>45</b>	<b>370</b>	
1Q2014	<b>17</b>	4.7	<b>54</b>	12	<b>51</b>	<b>320</b>	
2Q2014	<b>9.5</b>	5.3	<b>39</b>	17	<b>48</b>	<b>320</b>	

Monitoring Well ID	Date	Benzene	Toluene	Ethyl-benzene	m-/p-Xylene	o-Xylene	Naphthalene
MCL <sup>a</sup>		5	1,000	700	10,000 (total)	10,000 (total)	NA
EPA Tapwater RSL <sup>b</sup>		0.45	110	1.5	19	19	0.17
	3Q2014	<b>17</b>	<5.0	<b>65</b>	13	<b>47</b>	<b>460</b>
	4Q2014	<b>29</b>	11	<b>150</b>	<b>140<sup>a</sup></b>		<b>470</b>
<p><i>Notes:</i></p> <p>a - Current federal MCLs were obtained from <a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a> (accessed June 16, 2015)</p> <p>b - Current tapwater RSLs (June 2015) were obtained from <a href="http://www.epa.gov/region9/superfund/prg/">http://www.epa.gov/region9/superfund/prg/</a> (accessed June 23, 2015); noncarcinogenic RLS based on an HI of 0.1 to account for multiple COCs acting on the same target organ or system</p> <p>c - Result reported as total xylene</p> <p>d - Additional sampling events occurred between 1993 and 2010; 1990 and 1993 data are included to show concentrations prior to remedy implementation</p> <p>e - 1Q2010 equates to first quarter sampling 2010; 2Q2010 equates to second quarter sampling 2010, etc.</p> <p>f - result presented in bold text indicates the detected concentration exceeds the RSL; result presented in italicized text indicates the detected concentration exceeds the MCL</p>							

**Table C-2: Supplemental Investigation Soil Analytical Data (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)**

Supplemental Investigation - Soil Sample Analytical Results  
 PICCO Resins Disposal Site  
 Jefferson Hills Borough, Pennsylvania

Analyte <sup>1)</sup>	Acetone	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	Methyl-acetate	Methylcyclohexane	Styrene	Toluene	1,2,4-Trichlorobenzene	Total Xylenes	2-Methylnaphthalene	Naphthalene
USEPA Region 3 Industrial Soils Noncarcinogenic Screening Levels	(µg/Kg) 630,000,000	--	450,000	29,000,000	21,000,000	--	--	--	--	45,000,000	270,000	2,700,000	2,200,000	620,000
USEPA Region 3 Industrial Soils Carcinogenic Screening Levels	(µg/Kg) --	--	5,400	--	27,000	--	--	--	--	--	99,000	--	--	18,000
SB-1-7 11-14-2012	(µg/Kg) 14 J	24 U	< 0.70 U	< 1.3 U	< 1.3 U	< 1.8 U	9.6 U	< 0.83 U	4.8 U	< 0.81 U	< 0.86 U	< 1.1 U	1,600	3,200
SB-1-11 11-14-2012	(µg/Kg) 23 J	22 U*	2.3 J	< 1.1 U	< 1.1 U	2.0 J	8.8 U	1.8 J	4.4 U	1.7 J	< 0.79 U	5.1 J	910	2,200
SB-2-4 11-14-2012	(µg/Kg) 35 J	27 U	2.1 J	< 1.4 U	1.7 J	< 2.0 U	11.0 U	2.4 J	5.4 U	1.1 J	< 0.95 U	8.0 J	1,800	3,600
SB-2-11.5 11-14-2012	(µg/Kg) < 34 U	77 U	< 2.3 U	< 4.0 U	30	6.8 J	31.0 U	3.7 J	15.0 U	7.1 J	< 2.8 U	130	11,000	110,000
SB-3-6 11-14-2012	(µg/Kg) < 820 U	1,900 U*	< 54 U	1,300	160 J	150 J	750 U	3,300	370.0 U	160 J	70 J	1,400	2,100	6,100
SB-3-7 11-14-2012	(µg/Kg) 31 J	26 U	< 0.75 U	< 1.3 U	< 1.3 U	< 1.9 U	10.0 U	< 0.88 U	5.1 U	< 0.86 U	< 0.91 U	< 1.1 U	2,000	1,400
SB-4-9 11-15-2012	(µg/Kg) 92 U	46 U	9 U	18 U*	15	9 U*	18 U*	18 U	9 U	13	9 U	70	150 J	1,000
SB-4-14 11-15-2012	(µg/Kg) 46 U	23 U	5 U	9 U*	5 U	5 U	9 U*	9 U	5 U	5 U	5 U	9 U	46 J	410
SB-5-13 11-15-2012	(µg/Kg) 16 J	25 U	5 U	10 U	5 U	5 U	10 U*	10 U	5 U	5 U	5 U	10 U	340 J	230 J
SB-5-15 11-15-2012	(µg/Kg) 120 U*	58 U*	12 U	23	37	37	23 U	52	12 U	22	12 U	85	940	3,500
SB-6-5 11-15-2012	(µg/Kg) 54 U	27 U	5.4 U	11 U*	5.4 U	5.4 U	11 U*	11 U	5.4 U	5.4 U	5.4 U	11 U	540	410
SB-6-6 11-15-2012	(µg/Kg) 64	19 J	5 U	11 U*	5 U	5 U	11 U	1.2 J	5.4 U	5.4 U	5.4 U	11 U	550	790
SB-6-6D 11-15-2012	(µg/Kg) 140	38	1 J	12 U*	2 J	6 U	12 U	2 J	6 U	6 U	6 U	9 J	430 J	820
SB-7-6 11-15-2012	(µg/Kg) 34 J	8.5 J	4.3 U	8.7 U*	4.3 U	4.3 U	8.7 U	9 U	4 U	4 U	4 U	9 U	44 J	61 J
SB-7-7 11-15-2012	(µg/Kg) 37 J	8 J	5 U	9 U*	5 U	5 U	9 U	9 U	5 U	5 U	5 U	9 U	230/270 J/JH	170/240 J/JH
SB-8-4.5 11-15-2012	(µg/Kg) 4,600 U	2,300 U	110 J	940	300 J	810	870 J	2,600	460 U	210 J	460 U	1,200	2,800	23,000
SB-8-11 11-15-2012	(µg/Kg) 240,000	120,000 U	3,500 J	47,000 U	69,000	15,000 J	47,000 U	47,000 U	24,000 U	73,000	24,000 U	540,000	39,000	380,000
SB-9-2 11-15-2012	(µg/Kg) 49,000 U	25,000 U	4,900 U	9,800 U	4,900 U	4,900 U	9,800 U	2,600 J	4,900 U	870 J	4,900 U	9,800 U	22,000	320,000
SB-9-6 11-15-2012	(µg/Kg) 190,000 U	96,000 U	19,000 U	38,000 U	49,000	16,000 J	38,000 U	38,000 U	19,000 U	35,000	19,000 U	370,000	1,100	2,300
SB-10-4 11-15-2012	(µg/Kg) 4,400 U	2,200 U	440 U	1,700 *	470	400 J	1,600	4,400	440 U	290 J	440 U	2,000	130 J	610
SB-10-9 11-15-2012	(µg/Kg) 400,000 U	200,000 U	40,000 U	80,000 U*	130,000	35,000 J	80,000 U	80,000 U	40,000 U	130,000	40,000 U	830,000	26,000 J	380,000
SB-10-4D 11-15-2012	(µg/Kg) 4,800 U	2,400 U	480 U	2,200 *	990	580	950 U	5,200	480 U	360 J	480 U	2,100	1,300	5,900

Supplemental Investigation - Soil Sample Analytical Results  
 PICCO Resins Disposal Site  
 Jefferson Hills Borough, Pennsylvania

Analyte <sup>1)</sup>	Acetone	2-Butanone	Benzene	Cyclohexane	Ethylbenzene	Isopropylbenzene	Methyl-acetate	Methylcyclohexane	Styrene	Toluene	1,2,4-Trichlorobenzene	Total Xylenes	2-Methylnaphthalene	Naphthalene
USEPA Region 3 Industrial Soils Noncarcinogenic Screening Levels	(µg/Kg) 630,000,000	--	450,000	29,000,000	21,000,000	--	--	--	--	45,000,000	270,000	2,700,000	2,200,000	620,000
USEPA Region 3 Industrial Soils Carcinogenic Screening Levels	(µg/Kg) --	--	5,400	--	27,000	--	--	--	--	--	99,000	--	--	18,000
SB-11-4 12-13-2012	(µg/Kg) 73	15 J	6 U	11 U	6 U	6 U	11 U	11 U	1 J	6 U	6 U	2 J	270 J	480
SB-11-8 12-13-2012	(µg/Kg) 520,000 U	260,000 U	<b>52,000</b> U	100,000 U	<b>130,000</b>	40,000 J	100,000 U	100,000 U	48,000 J	180,000	52,000 U	990,000	48,000	<b>750,000</b>
SB-16-3 12-13-2012	(µg/Kg) 3,300 U	1,600 U	130 J	680	540	360	340 J	2,300	330 U	560	330 U	2,800	2,400 J	<b>50,000</b>
SB-16-9 12-13-2012	(µg/Kg) 900,000 U	450,000 U	<b>90,000</b> U	180,000 U	<b>140,000</b>	90,000 U	180,000 U	180,000 U	90,000 U	99,000	90,000 U	1,000,000	120,000 J	<b>1,500,000</b>
SB-17-4 12-13-2012	(µg/Kg) 4,100 U	2,000 U	410 U	820 U	410 U	410 U	820 U	230 J	410 U	410 U	410 U	100 J	1,100	1,900
SB-17-7 12-13-2012	(µg/Kg) 26,000 U	13,000 U	450 J	5,200 U	11,000	3,200	5,200 U	5,200 U	2,600 U	6,400	2,600 U	85,000	35,000 J	<b>510,000</b>

Notes:

**Bold** - Indicates concentration exceeds RSL

**Bold** - Indicates laboratory reporting limit concentration exceeds RSL

J - Result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value

U - Analyte was analyzed for but not detected above the laboratory reporting limit

H - Sample was prepped or analyzed beyond the specified holding time

\* - LCS or LCSD exceeds the control limits or RPD of the LCS and LCSD exceeds the control limits

µg/Kg - microgram per kilogram

Sample collection depth indicated by last number in sample ID (i.e. SB-16-9 = sample from soil boring 16 collected from 9 feet below ground surface)

1) Constituents were analyzed by Method 8260B with the exception of naphthalene and 2-methylnaphthalene which were analyzed by Method 8270.

**Table C-3: Supplemental Investigation Groundwater Analytical Data (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)**

Supplemental Investigation Groundwater Analytical Data  
 Supplemental Investigation Report  
 PICCO Resins Disposal  
 Jefferson Hills, Pennsylvania

Analyte	USEPA MCL	Units	UC-1-GW-9 12-19-12	UC-1-GW-9 03-18-13	UC-2-GW-5 12-19-12	UC-2-GW-7 03-18-13	LC-1-GW-8 12-19-12	LC-1-GW-7 03-19-13	LC-3-GW-16 12-19-12	LC-3-GW-16 03-20-13	LC-4-GW-18 12-18-12	P-3-GW-25 03-18-13	P-4-GW-20 03-18-13	P-5B-GW-10 03-18-13	UC-5-GW-8 12-18-12	UC-5-GW-8D 12-18-12	UC-5-GW-10 03-18-13	UC-5-GW-10D 03-18-13	P-2-GW-10 03-18-13	P-5A-GW-9 03-18-13	SB-1-GW-16 11-29-2012	SB-1-GW-16 03-20-13	SB-3-GW-10 11-29-2012	SB-3-GW-11 03-19-13	SB-4-GW-12 11-29-2012	SB-4-GW-10 03-19-13	
Acetone	--	(µg/L)	57	25 U*	25 U	25 U	11 J	25 U	50 U	25 U	9.1 J	25 U	25 U	25 U*	25 U	25 U	25 U	25 U	230 J	6 J	190 J	500 U	25 U	25 U	25 U	25 U	25 U
Benzene	5	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.3	0.49 J	0.87 J	49	1.0 U	1.8	1.0 U	1.0 U	1.0 U	1.0 U	160	2.3	82	120	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform	80	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	20 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.17 J	42	23	5.8	190	1.0 U	2.8	0.33 J	0.32 J	0.36 J	0.31 J	700	5.9	480	560	0.58 J	1.0 U	1.0 U	6.6	5.9
Isopropylbenzene	--	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.1	3.0 U	0.76 J	18	1.0 U	0.7 J	1.0 U	1.0 U	1.0 U	1.0 U	110	0.75 J	97	90	0.32 J	1.0 U	1.6	1.9	
Methyl acetate	--	(µg/L)	0.97 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	20 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylcyclohexane	--	(µg/L)	1.0	0.21 J	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	1.0 U	0.97 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	20 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	1.4	1.0 U	2.0 U	1.0 U	1.0 U	0.12 J	1 U	1.0 U	1.0 U	1.0 U	1.0 U	20 U	62	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1,000	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	0.42 J	1.0 U	15	2.7	6.1	16	1.0 U	3.1	0.74 J	1.10	0.37 J	0.48 J	1.0 U	1.0 U	210	190	1.0 U	1.0 U	0.45 J	0.48 J	
1,2,4-Trimethylbenzene	--	(µg/L)	1.0 U	0.38 J	1.0 U	1.0 U	0.81 J	4.3	240	140	63	330	1.0 U	4.4	1.4	1.7	2.1	2.0	2,600	58	2,300	2,500	3.5 J	1.0 U	20	26.0	
1,3,5-Trimethylbenzene	--	(µg/L)	1.0 U	1.0 U	1.0 U	1.0 U	0.36 J	4.7	88	32	23	53	1.0 U	1.0 U	0.69 J	0.75 J	1.3	1.0	510	2.2	1,100	1,100	1.3 J	1.0 U	8.7	4.6	
Xylenes, Total	10,000	(µg/L)	2.0 U	2.0 U	2.0 U	2.0 U	0.51 J	3.1	240	79	29	580	2.0 U	7.9	2.2	2.5	2.7 U	2.6	530	35	3,800	4,400	0.89 J	2.0 U	9.1	11	
2-Methylnaphthalene <sup>1)</sup>	--	(µg/L)	9.8 U	NA	9.8 U	9.7 U	NA	NA	NA	NA	NA	1.8 J	10 U	10 U	9.6 U	NA	10 U	NA	530 J	9.6 U	NA	NA	9.7 U	9.8 U	0.91 J	10 U	
Naphthalene <sup>1)</sup>	--	(µg/L)	9.8 U	NA	9.8 U	1.4 J	5.1	NA	480 E	NA	1,400 E	81	1.2 J	10 U	3.2 J	6.2	10 U	NA	8,100	9.6 U	NA	NA	5.5 J	9.8 U	31	33	

Analyte	USEPA MCL	Units	SB-5-GW-17 03-20-13	SB-6-GW-8 11-29-2012	SB-6-GW-8D 11-29-2012	SB-6-GW-7 03-19-13	SB-7-GW-8 11-29-2012	SB-7-GW-8 03-19-13	SB-11-GW-7 12-18-12	SB-11-GW-8 03-20-13	SB-12-GW-10 12-18-12	SB-12-GW-9 03-19-13	SB-16-GW-12 12-18-12	SB-17-GW-6 12-18-12	SB-17-GW-6 03-20-13	TW-1-GW-10 3/18/13	TW-16-GW-6 3-18-13	A-GW-9 12-18-12	A-GW-9 1-30-13	B-GW-9 12-19-12	C-GW-12 12-19-12	C-GW-12 1-30-13	D-GW-9 12-19-12	E-GW-7 12-19-12	E-GW-7 1-30-13	F-GW-9 12-19-12	F-GW-9 1-30-13	G-GW-11 12-19-12
Acetone	--	(µg/L)	10 J	25 U	25 U	25 U	19 J	6.0 J	2,500 U	1,300 U	19 J	25 U	1,300 U	1,300 U	500 U	25 U	25 U	25 U	25 U	25 U	2,500 U	2,500 U	50 U	1,300 U	1,300 U	8.5 J	25.0 U	25 U
Benzene	5	(µg/L)	0.52 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	590	790	1.0 U	1.0 U	570	270	13	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	280	270	2.0 U	43 J	27 J	1.0 U	1.0 U	1.0 U
Chloroform	80	(µg/L)	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	50 U	1.0 U	1.0 U	50 U	50 U	3.0 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	100 U	2.0 U	50 U	50 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	(µg/L)	5.4	1.0 U	1.0 U	1.0 U	0.3 J	4.2 U	2,500	2,600	0.7 J	19	2,500	1,000	62	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1,100	1,100	8.2	640 J	540	0.13 J	0.34 J	1.0 U
Isopropylbenzene	--	(µg/L)	10	1.0 U	1.0 U	1.0 U	1.0 U	0.61 J	240	240	0.2 J	2.4	150	110	87	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	92 J	92 J	6.0	420	380	0.22 J	0.28 J	1.0 U
Methyl acetate	--	(µg/L)	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	50 U	1.0 U	1.0 U	50 U	50 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	100 U	2.0 U	50 U	50 U	1.0 U	1.0 U	1.0 U
Methylcyclohexane	--	(µg/L)	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	50 U	0.2 J	0.41 J	50 U	50 U	20 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	100 U	2.0 U	50 U	50 U	1.0 U	1.0 U	1.0 U
Styrene	100	(µg/L)	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	50 U	1.0 U	2.6	50 U	50 U	200	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100 U	100 U	2.0 U	50 U	50 U	1.0 U	1.0 U	1.0 U
Toluene	1,000	(µg/L)	2.1	1.0 U	1.0 U	1.0 U	1.0 U	2.6	3,500	4,000	0.6 J	7.3	5,300	2,700	1,100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1,200	1,200	2.0 U	250	120	1.0 U	1.0 U	1.0 U
1,2,4-Trimethylbenzene	--	(µg/L)	150	1.0 U	1.0 U	1.0 U	1.0 U	21	5,200	5,200	3.5	73	5,300	2,900	2,500	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4,600	4,400	180	3,500	3,500	2.1	3.1	0.34 J
1,3,5-Trimethylbenzene	--	(µg/L)	88	1.0 U	1.0 U	1.0 U	5.3	9.4	2,000	2,000	1.1	31	2,100	1,200	1,100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1,900	1,800	57	1,100	880	2.2	1.0 J	1.0 U
Xylenes, Total	10,000	(µg/L)	21	2.0 U	2.0 U	2.0 U	2.6	29	13,000	14,000	2.8	100	13,000	7,800	5,500	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	9,100	9,300	54	3,000	2,400	4.8	1.7 J	0.23 J
2-Methylnaphthalene <sup>1)</sup>	--	(µg/L)	NA	10 U	NA	10 U	NA	NA	110 J	980 U	NA	NA	140 J	NA	NA	9.8 U	9.6 U	9.6 U	NA	9.8 U	NA	NA	9.7 U	75 J	NA	9.6 U	NA	9.7 U
Naphthalene <sup>1)</sup>	--	(µg/L)	NA	10 U	NA	10 U	NA	NA	4,500	3,500	3.5 J	NA	5,800	3,800	NA	9.8 U	9.6 U	9.6 U	5 U	9.8 U	9,700	7,700	3.6 J	1,500	2,200	9.6 U	7.7	9.7 U

Notes:  
**Bold** - Indicates concentration exceeds MCL  
**Bold** - Indicates laboratory reporting limit concentration exceeds RSL  
 J - Result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value  
 U - Analyte was analyzed for but not detected above method detection limit  
 E - Result exceeded calibration range  
 \* - Relative percent difference of the lab control sample and lab control sample duplicate exceeded control limits  
 µg/L - microgram per liter  
 NA - Sample volume was not sufficient for semivolatiles compound analysis and was not analyzed for  
 1) Where sufficient volume was available, naphthalene and 2-methylnaphthalene were analyzed via Method 8270. In instances where insufficient volume was not available, naphthalene was analyzed via Method 8260B

Analyte	USEPA MCL	Units	TW-7-GW-93 03-17-13	TW-13 09-27- 12	TW-13 11-28- 12	TW-13 03-09- 13	TW-14 09-27-12	TW-14 11-28- 12	TW-14 03-09-13	TW-23-GW- 130 03-17-13
Acetone	--	(µg/L)	25 U	NA	NA	NA	NA	NA	NA	25 U
Benzene	5	(µg/L)	1.0 U	<1.0	<b>6.5</b>	<b>5.1</b>	<b>16</b>	<b>20</b>	<b>20</b>	1.0 U
Chloroform	80	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
Ethylbenzene	700	(µg/L)	1.0 U	7.1	9	16	75	88	64	1.0 U
Isopropylbenzene	--	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
Methyl acetate	--	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
Methylcyclohexane	--	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
Styrene	100	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
Toluene	1,000	(µg/L)	1.0 U	<1.0	<1.0	<1.0	<10	<10	<10	1.0 U
1,2,4-Trimethylbenzene	--	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
1,3,5 Trimethylbenzene	--	(µg/L)	1.0 U	NA	NA	NA	NA	NA	NA	1.0 U
Xylenes, Total	10,000	(µg/L)	2.0 U	7.3	6.0	2.1	90	123	123	2.0 U
2-Methylnaphthalene <sup>1)</sup>	--	(µg/L)	10 U	NA	NA	NA	NA	NA	100	9.7 U
Naphthalene <sup>1)</sup>	--	(µg/L)	10 U	43	20	27	1,000	1,000	630	0.83 J

Notes:

**Bold** - Indicates concentration exceeds MCL

**Bold** - Indicates laboratory reporting limit concentration exceeds RSL

J - Result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value

U - Analyte was analyzed for but not detected above method detection limit

E - Result exceeded calibration range

\* - Relative percent difference of the lab control sample and lab control sample duplicate exceeded control limits

µg/L - microgram per liter

NA - Sample volume was not sufficient for semivolatile compound analysis and was not analyzed for

1) Where sufficient volume was available, naphthalene and 2-methylnaphthalene were analyzed via Method 8270. In instances where insufficient volume was not available, naphthalene was analyzed via Method 8260B



**Table C-4: Surface Water Analytical Data (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)**

Surface Water Analytical Data  
 Supplemental Investigation Report  
 PICCO Resins Disposal  
 Jefferson Hills, Pennsylvania

Analysis Method	CAS	Analyte	Unit	EPA Region III - BTAG Freshwater Screening Benchmarks	PADEP - Water Quality Criteria for Toxic Substances		Dup	SW-1	SW-2	SW-4	SW-8	SW-10	SW-11
					Fish and Aquatic Life	Human Health	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012
							12:20	13:00	12:40	11:45	10:15	9:45	9:00
8260B	67-64-1	Acetone	µg/L		450000	3500	<25 U	38	<25 U	<25 U	<25 U	<25 U	<25 U
8260B	67-66-3	Chloroform	µg/L		1900	5.7	0.23 J B	0.28 J B	0.25 J B	0.3 J B	0.31 J B	0.28 J B	0.31 J B
8260B	100-41-4	Ethylbenzene	µg/L	1100	2900	530	1.5	<1.0 U	2	17	0.16 J	<1.0 U	<1.0 U
8260B	98-82-8	Isopropylbenzene	µg/L	86			0.87 J	<1.0 U	0.99 J	5.3	<1.0 U	<1.0 U	<1.0 U
8260B	91-20-3	Naphthalene	µg/L	176	140	N/A	140	<5.0 U	130	130	<5.0 U	<5.0 U	<5.0 U
8260B	100-42-5	Styrene	µg/L	559			0.56 J	<1.0 U	0.54 J	5.7	<1.0 U	<1.0 U	<1.0 U
8260B	108-88-3	Toluene	µg/L		1700	1300	0.76 J	<1.0 U	1	4.2	<1.0 U	<1.0 U	<1.0 U
8260B	1330-20-7	Xylenes, Total	µg/L		1100	70000	16	4.7	19	92	1.7 J	<2.0 U	<2.0 U
8270C	91-57-6	2-Methylnaphthalene	µg/L				670	<9.8 U	500	<10 U	<10 U	<10 U	<9.8 U

Notes:

United States Environmental Protection Agency Region 3 Freshwater Screening Benchmarks from [http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/R3\\_BTAG\\_FW\\_Benchmarks\\_07-06.pdf](http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fw/R3_BTAG_FW_Benchmarks_07-06.pdf)

Pennsylvania Department of Environmental Protection Water Quality Criteria for Toxic Substances from <http://www.pacode.com/secure/data/025/chapter93/chap93toc.html>

- Bold, highlighted value indicates exceedance of lowest available screening criteria

N/A - Not Applicable

ND - Non-Detect

J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

B - Compound was found in the blank and sample

D - Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis

U- Analyzed for but not detected

**Table C-5: Sediment Analytical Data (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)**

Sediment Analytical Data  
Supplemental Investigation Report  
PICCO Resins Disposal  
Jefferson Hills, Pennsylvania

Analysis Method	CAS	Analyte	Units	EPA Region 5 ESLs - Sediment	USEPA - Freshwater Sediment Screening	Dup	SD-1	SD-2	SD-3	SD-4	SD-5	SD-6	SD-7	SD-8	SD-9	SD-10	SD-11	
						8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012	8/29/2012
						12:20	13:20	12:50	12:10	12:00	11:35	11:15	10:45	10:30	10:00	9:50	9:35	
8260B	78-93-3	2-Butanone	µg/Kg			<79 U	<42 U	<26000 U	<14000 U	590 J	<2800 U	<6300 U	<65000 U	<7500 U	580 J	<27 U	<49 U	
8260B	67-64-1	Acetone	µg/Kg			<160 U	<84 U	<52000 U	<29000 U	<5000 U	<5500 U	<13000 U	<130000 U	<15000 U	1200 J	<55 U	<97 U	
8260B	75-15-0	Carbon disulfide	µg/Kg		0.851	<16 U	<8.4 U	<b>1400 J</b>	<2900 U	<500 U	<550 U	<1300 U	<13000 U	<1500 U	<510 U	<5.5 U	<9.7 U	
8260B	110-82-7	Cyclohexane	µg/Kg			<32 U	<17 U	<10000 U	<5700 U	<1000 U	<1100 U	<2500 U	<26000 U	<3000 U	470 J	<5.5 U	<19 U	
8260B	100-41-4	Ethylbenzene	µg/Kg		1100	8.1 J	<8.4 U	<5200 U	<b>1200 J</b>	<500 U	270 J	540 J	<b>9600 J</b>	660 J	<510 U	<5.5 U	<9.7 U	
8260B	98-82-8	Isopropylbenzene	µg/Kg		86	<16 U	<17 U	<5200 U	<b>1100 J</b>	<500 U	<550 U	<b>490 J</b>	<13000 U	<1500 U	<510 U	<11 U	<19 U	
8260B	79-20-9	Methyl acetate	µg/Kg			<32 U	<17 U	5800 J	<5700 U	<1000 U	<1100 U	1600 J	<26000 U	<3000 U	750 J	<11 U	<19 U	
8260B	108-87-2	Methylcyclohexane	µg/Kg			<32 U	<8.4 U	<10000 U	<5700 U	<1000 U	430 J	240 J	<26000 U	460 J	1500	<5.5 U	<19 U	
8260B	91-20-3	Naphthalene	µg/Kg		176	<b>200</b>	<8.4 U	<b>51000</b>	<b>31000</b>	<b>2400</b>	<b>2400</b>	<b>25000</b>	<b>32000</b>	<b>23000</b>	<b>3200</b>	<5.5 U	14	
8260B	100-42-5	Styrene	µg/Kg		559	3.9 J	<8.4 U	<5200 U	<2900 U	<500 U	<550 U	<4300 U	<13000 U	<1500 U	<510 U	<5.5 U	<9.7 U	
8260B	108-88-3	Toluene	µg/Kg	1220		4.3 J	<8.4 U	<5200 U	<2900 U	<500 U	180 J	320 J	<13000 U	<1500 U	170 J	<5.5 U	<19 U	
8260B	1330-20-7	Xylenes, Total	µg/Kg	433		62 U	<17 U	<b>1400 J</b>	<b>9700</b>	200 J	<b>850 J</b>	<b>6900</b>	<b>24000 J</b>	<b>2300 J</b>	<b>960 J</b>	<11 U	<17 U	
8270C	91-57-6	2-Methylnaphthalene	µg/Kg	20.2		<b>69000</b>	<560 U	<b>23000</b>	<b>6500</b>	<460 U	<b>110 J</b>	<b>1800</b>	<b>2900</b>	<b>230 J</b>	<b>170 J</b>	<4400 U	<4000 U	

Notes:

United States Environmental Protection Agency Region 3 Freshwater Sediment Screening Benchmarks from <http://www.epa.gov/reg3hwmd/risk/eco/btag/sbv/fwsed/screenbench.htm>

United States Environmental Protection Agency Region 5 ESLs - Sediment from <http://www.epa.gov/R5Super/ecology/benchmarkmemo.htm>

**-** Bold, highlighted value indicates exceedance of lowest available screening criteria

N/A - Not Applicable

ND - Non-Detect

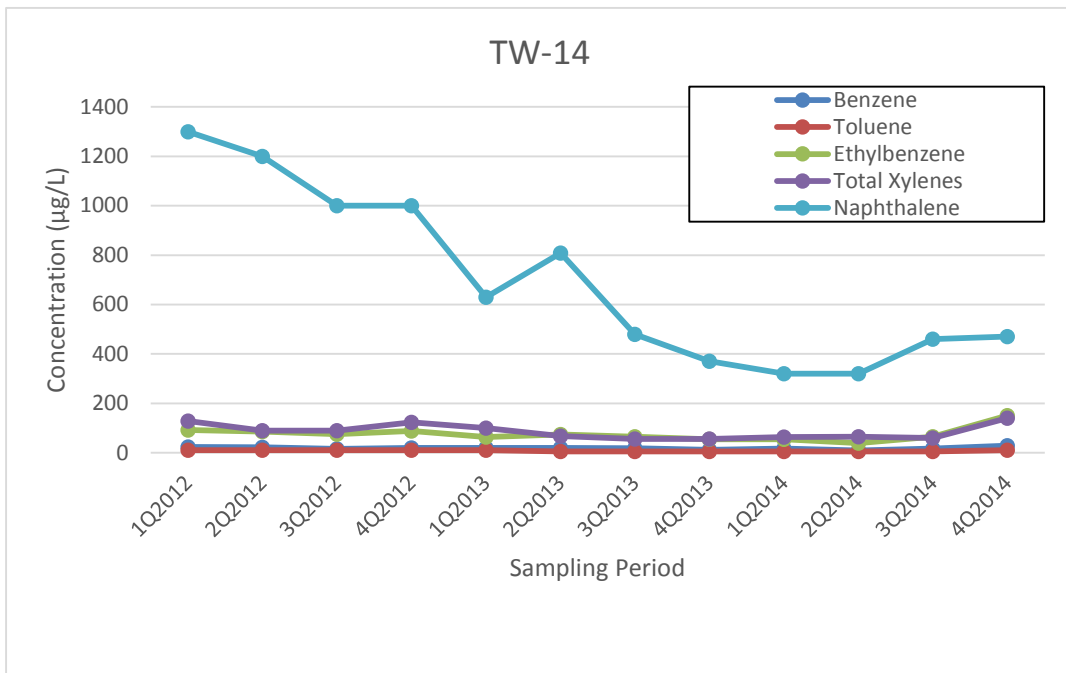
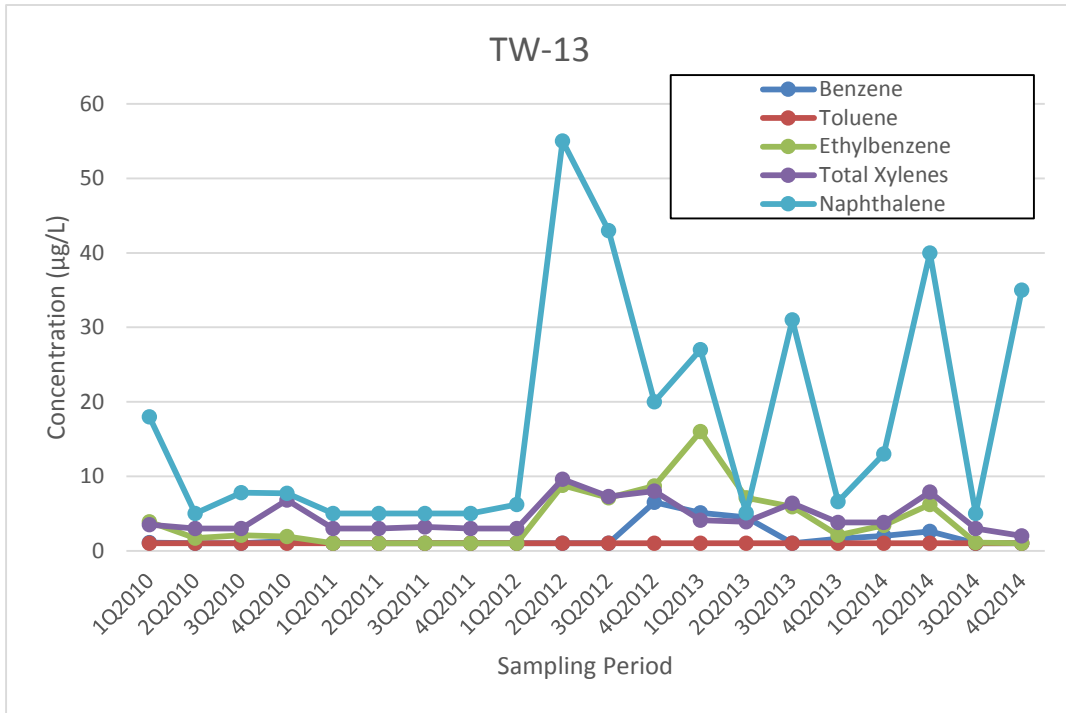
J - Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value

D - Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis

X - Surrogate is outside control limits

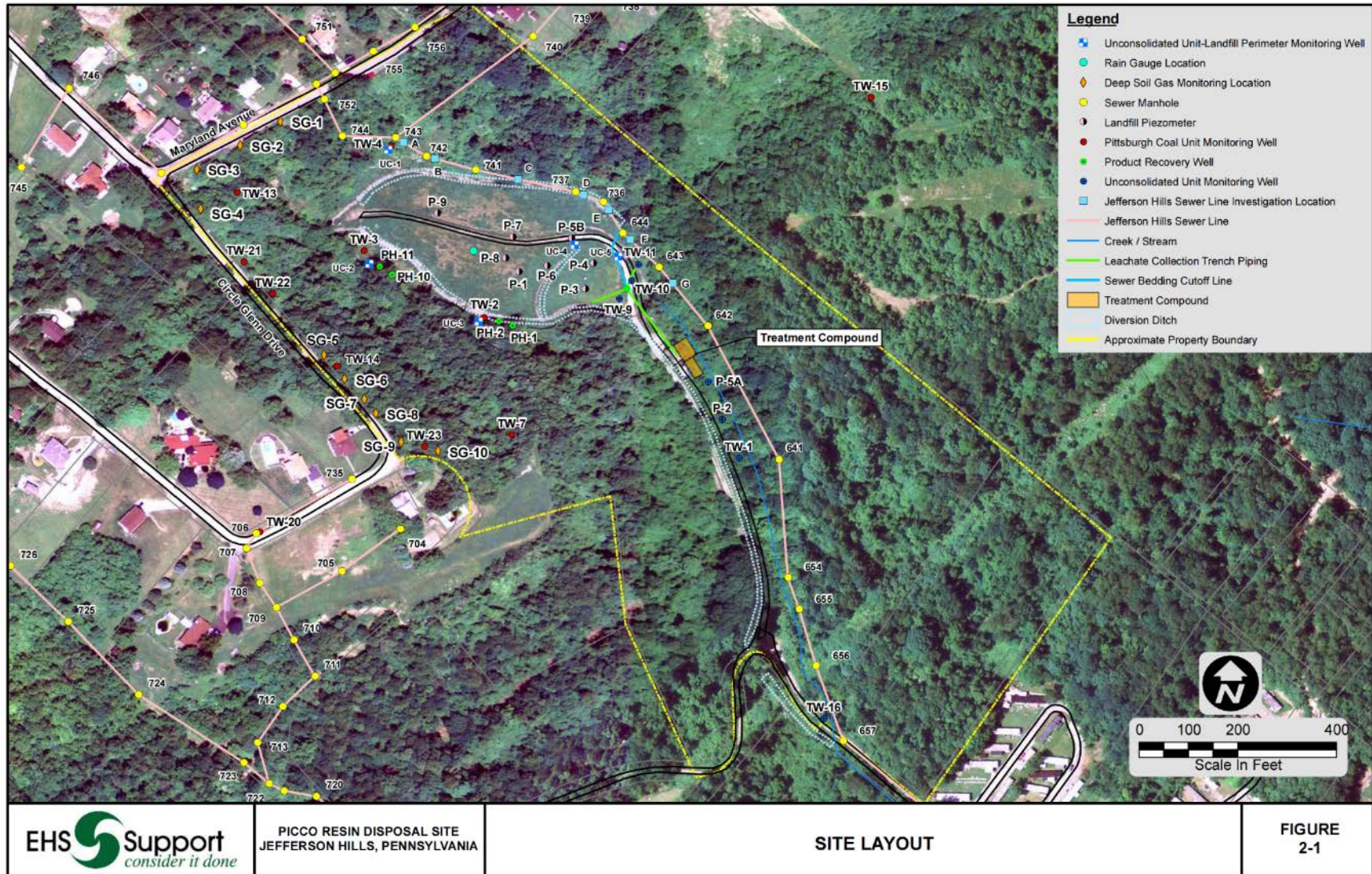
U - Analyzed for but not detected

**Figure C-1: Time–Concentration Graphs for Wells TW-13 and TW-14 (2010-2014)\***

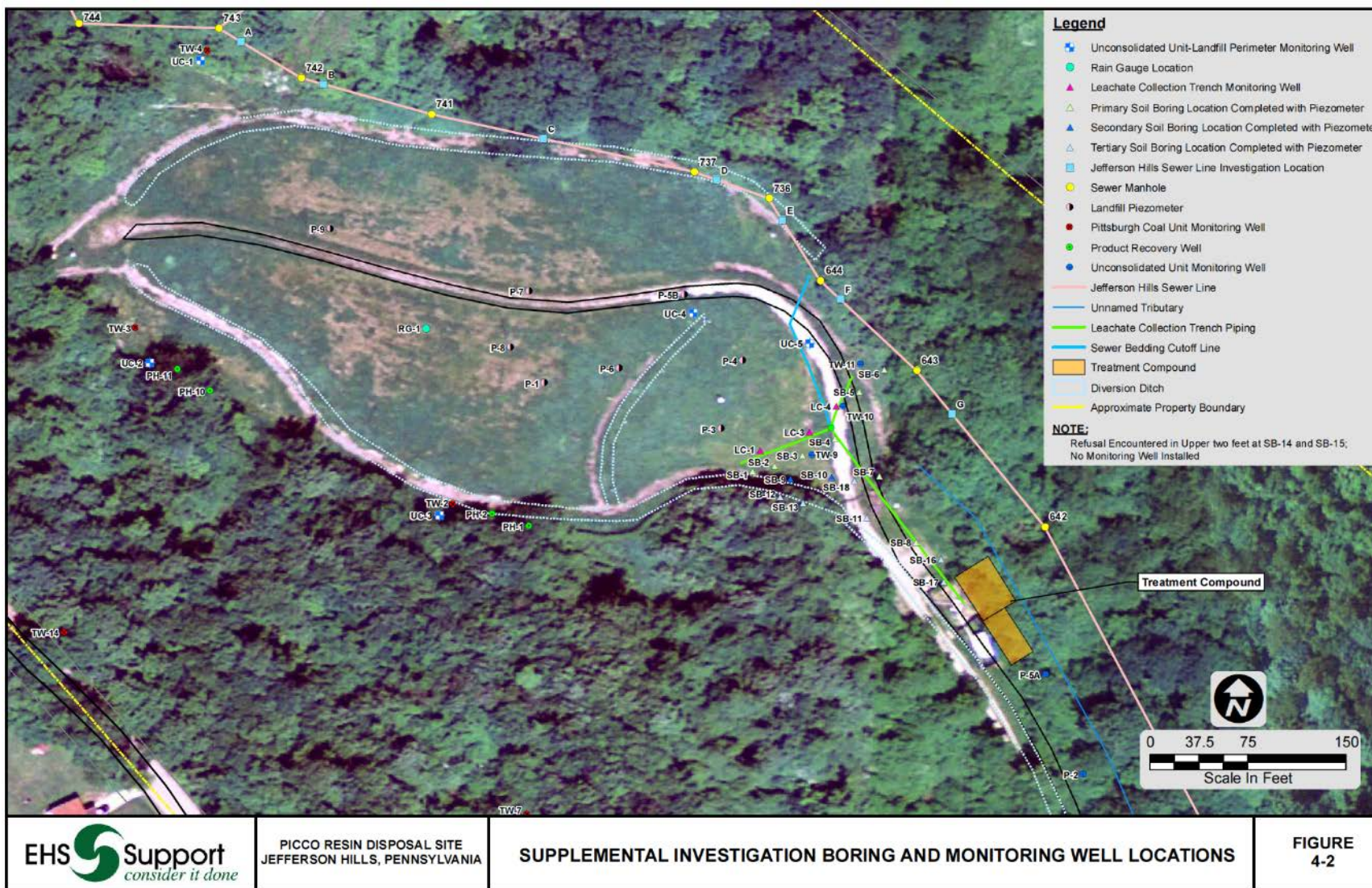


\*Well TW-14 was not sampled prior to 2012 due to the presence of NAPL.

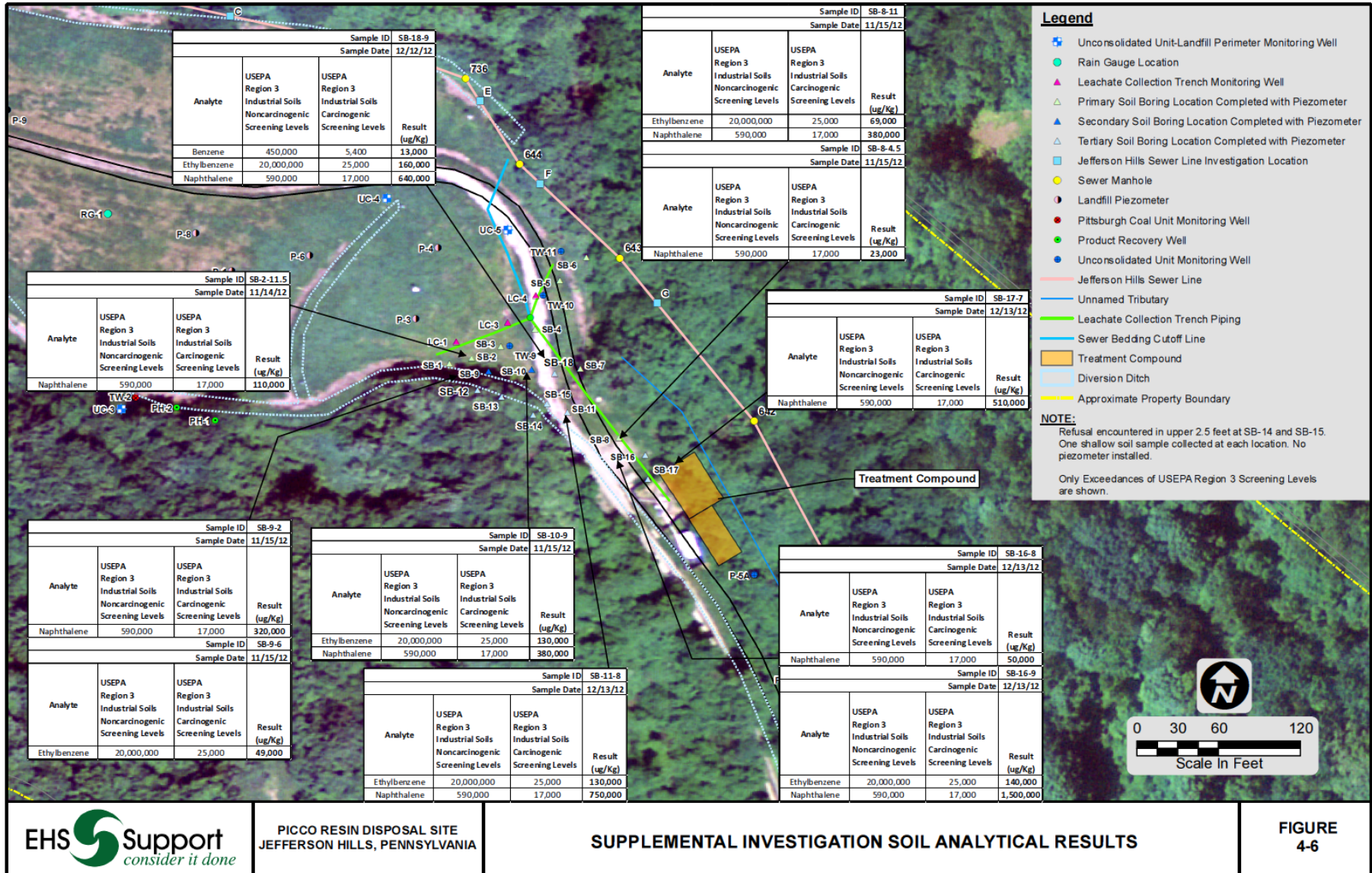
Figure C-2: Monitoring Locations (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)



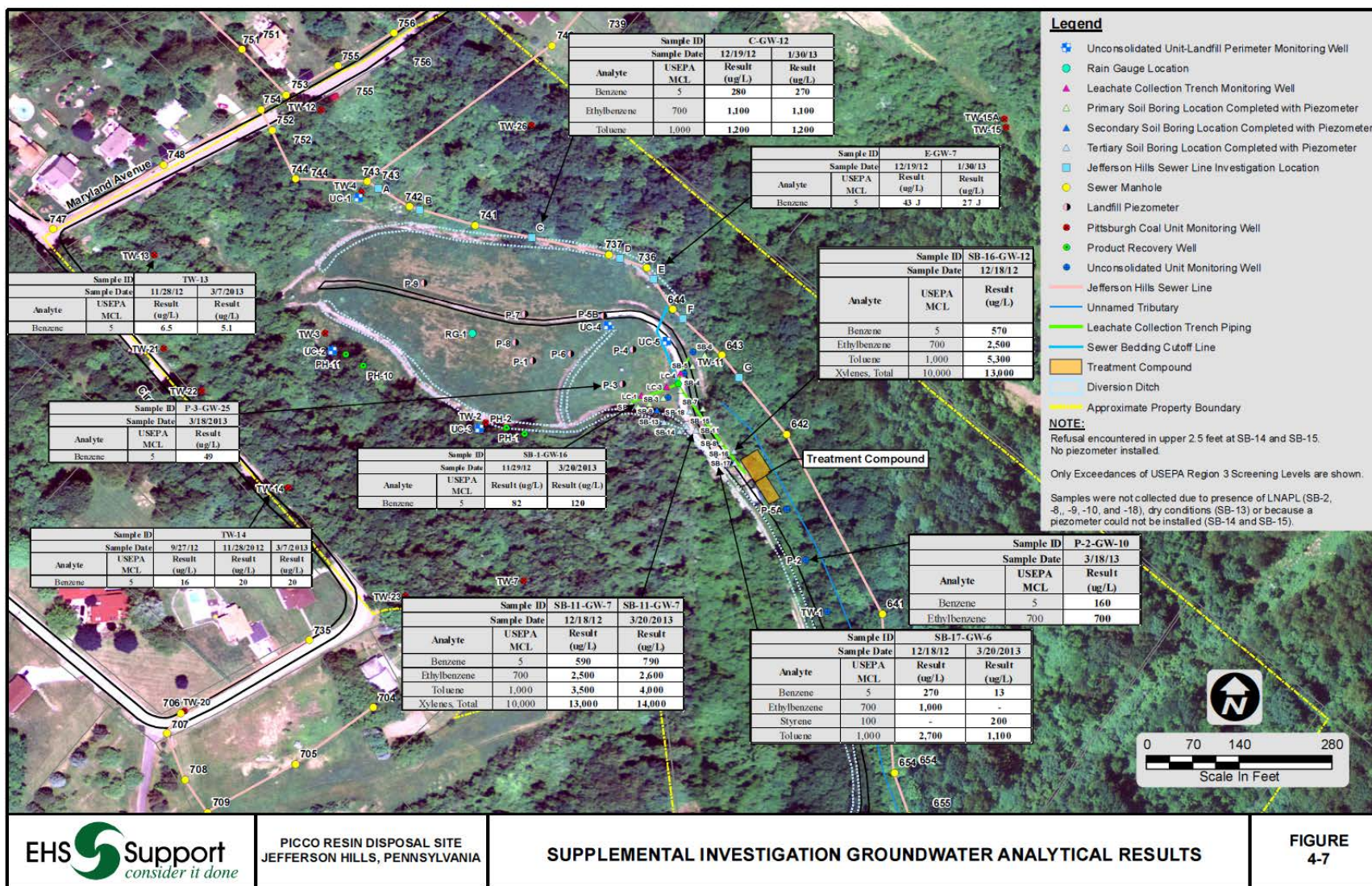
**Figure C-3: Supplement Investigation and Soil Boring Locations (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)**



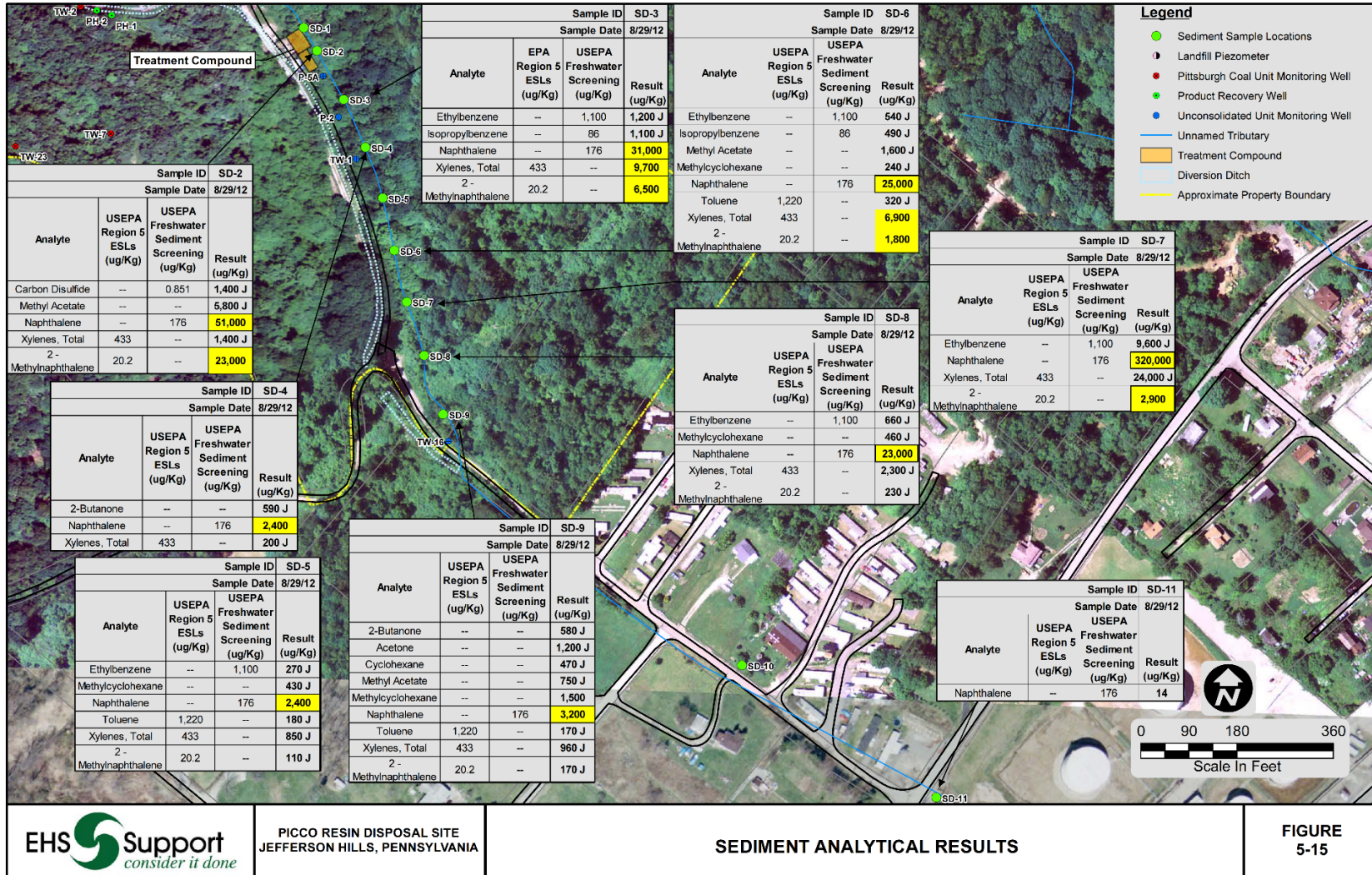
**Figure C-4: Supplemental Investigation Soil Analytical Results (Source: Supplemental Investigation Report, dated May 2013, prepared by EHS Support)**



**Figure C-5: Supplemental Investigation Groundwater Analytical Results (Source: Revised Supplemental Investigation Report, dated September 2015, prepared by EHS Support)**

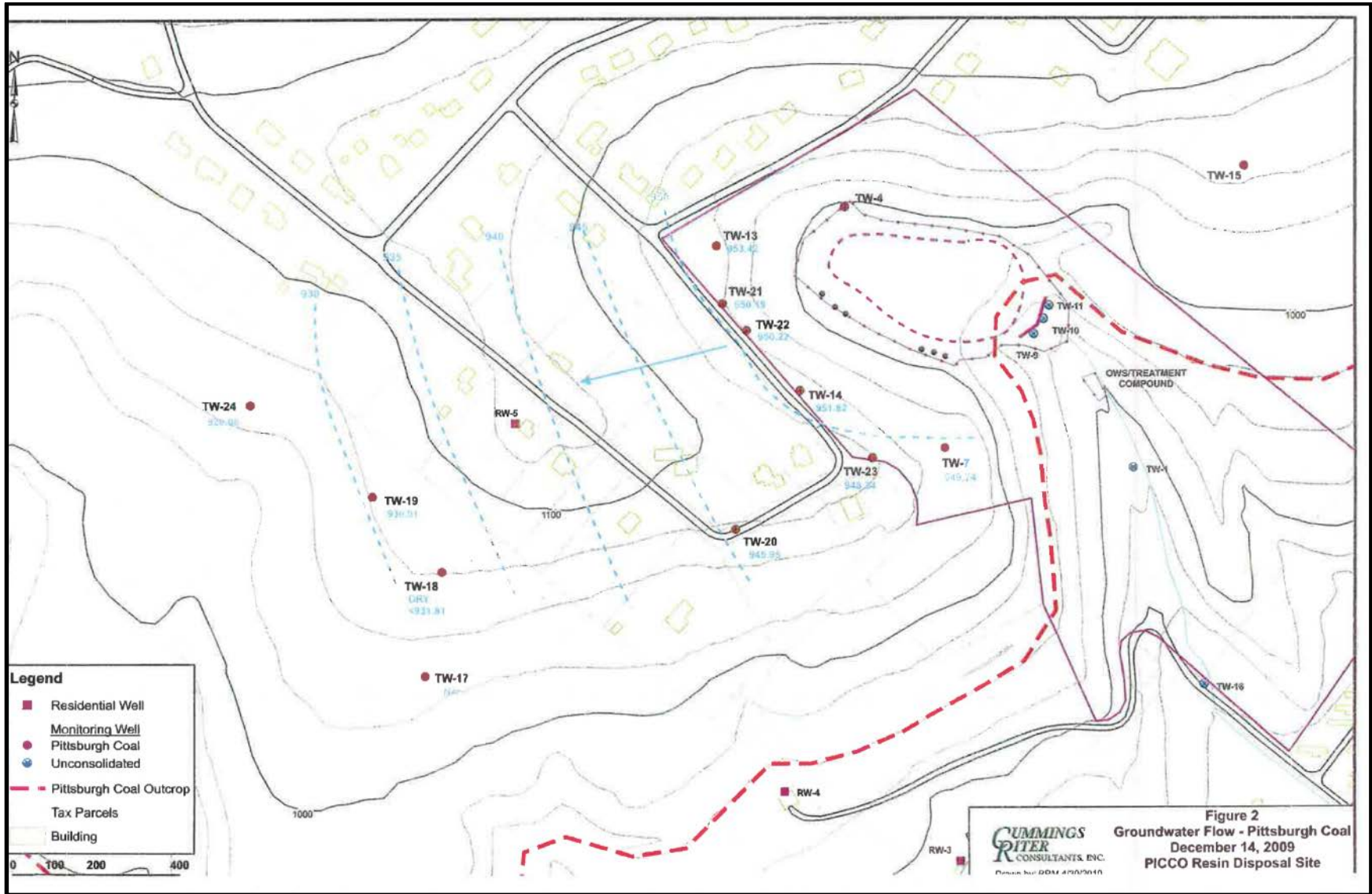


**Figure C-6: Supplemental Investigation Sediment Analytical Results (Source: Revised Supplemental Investigation Report, dated September 2015, prepared by EHS Support)**





**Figure C-7: Residential Well Locations (Source: Revised Long-Term Groundwater Monitoring Plan, dated April 2012, prepared by Cummings/Riter Consultants, Inc.)**



**Appendix D: Site Inspection Checklist**

<b>FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST</b>																																																																			
<b>I. SITE INFORMATION</b>																																																																			
<b>Site Name: Resin Disposal</b>	<b>Date of Inspection: 5/27/2015</b>																																																																		
<b>Location and Region: Jefferson Hills Borough, PA/Region 3</b>	<b>EPA ID: PAD063766828</b>																																																																		
<b>Agency, Office or Company Leading the Five-Year Review: EPA Region 3</b>	<b>Weather/Temperature: High 60s, passing drizzle</b>																																																																		
<b>Remedy Includes:</b> (Check all that apply) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <input checked="" type="checkbox"/> Landfill cover/containment  <input checked="" type="checkbox"/> Access controls  <input checked="" type="checkbox"/> Institutional controls  <input checked="" type="checkbox"/> Groundwater/leachate collection and treatment  <input type="checkbox"/> Surface water collection and treatment  <input type="checkbox"/> Other:           </td> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Monitored natural attenuation  <input type="checkbox"/> Ground water containment  <input type="checkbox"/> Vertical barrier walls           </td> </tr> </table>		<input checked="" type="checkbox"/> Landfill cover/containment <input checked="" type="checkbox"/> Access controls <input checked="" type="checkbox"/> Institutional controls <input checked="" type="checkbox"/> Groundwater/leachate collection and treatment <input type="checkbox"/> Surface water collection and treatment <input type="checkbox"/> Other:	<input type="checkbox"/> Monitored natural attenuation <input type="checkbox"/> Ground water containment <input type="checkbox"/> Vertical barrier walls																																																																
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<b>Attachments:</b> <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached																																																																			
<b>II. INTERVIEWS</b> (check all that apply)																																																																			
<b>1. O&amp;M Site Manager</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%; text-align: center;">Name _____</td> <td style="width: 30%; text-align: center;">Title _____</td> <td style="width: 40%; text-align: center;">Date _____</td> </tr> <tr> <td colspan="3">Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____</td> </tr> <tr> <td colspan="3">Problems, suggestions <input type="checkbox"/> Report attached: _____</td> </tr> </table>		Name _____	Title _____	Date _____	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____			Problems, suggestions <input type="checkbox"/> Report attached: _____																																																											
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Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____																																																																			
Problems, suggestions <input type="checkbox"/> Report attached: _____																																																																			
<b>2. O&amp;M Staff</b> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%; text-align: center;">Name _____</td> <td style="width: 30%; text-align: center;">Title _____</td> <td style="width: 40%; text-align: center;">Date _____</td> </tr> <tr> <td colspan="3">Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____</td> </tr> <tr> <td colspan="3">Problems/suggestions <input type="checkbox"/> Report attached: _____</td> </tr> </table>		Name _____	Title _____	Date _____	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____			Problems/suggestions <input type="checkbox"/> Report attached: _____																																																											
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Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone    Phone: _____																																																																			
Problems/suggestions <input type="checkbox"/> Report attached: _____																																																																			
<b>3. Local Regulatory Authorities and Response Agencies</b> (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.  <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">Agency _____</td> <td style="width: 35%;">Contact _____</td> <td style="width: 15%;">Name _____</td> <td style="width: 15%;">Title _____</td> <td style="width: 15%;">Date _____</td> <td style="width: 20%;">Phone No. _____</td> </tr> <tr> <td colspan="6">Problems/suggestions <input type="checkbox"/> Report attached: _____</td> </tr> <tr><td colspan="6"> </td></tr> <tr> <td>Agency _____</td> <td>Contact _____</td> <td>Name _____</td> <td>Title _____</td> <td>Date _____</td> <td>Phone No. _____</td> </tr> <tr> <td colspan="6">Problems/suggestions <input type="checkbox"/> Report attached: _____</td> </tr> <tr><td colspan="6"> </td></tr> <tr> <td>Agency _____</td> <td>Contact _____</td> <td>Name _____</td> <td>Title _____</td> <td>Date _____</td> <td>Phone No. _____</td> </tr> <tr> <td colspan="6">Problems/suggestions <input type="checkbox"/> Report attached: _____</td> </tr> <tr><td colspan="6"> </td></tr> <tr> <td>Agency _____</td> <td>Contact _____</td> <td>Name _____</td> <td>Title _____</td> <td>Date _____</td> <td>Phone No. _____</td> </tr> <tr> <td colspan="6">Problems/suggestions <input type="checkbox"/> Report attached: _____</td> </tr> </table>		Agency _____	Contact _____	Name _____	Title _____	Date _____	Phone No. _____	Problems/suggestions <input type="checkbox"/> Report attached: _____												Agency _____	Contact _____	Name _____	Title _____	Date _____	Phone No. _____	Problems/suggestions <input type="checkbox"/> Report attached: _____												Agency _____	Contact _____	Name _____	Title _____	Date _____	Phone No. _____	Problems/suggestions <input type="checkbox"/> Report attached: _____												Agency _____	Contact _____	Name _____	Title _____	Date _____	Phone No. _____	Problems/suggestions <input type="checkbox"/> Report attached: _____					
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	Name	Title	Date	Phone No.
	Problems/suggestions <input type="checkbox"/> Report attached: _____			
	Agency _____			
	Contact _____			
	Name	Title	Date	Phone No.
	Problems/suggestions <input type="checkbox"/> Report attached: _____			
4.	<b>Other Interviews</b> (optional) <input type="checkbox"/> Report attached: _____			
<b>III. ON-SITE DOCUMENTS AND RECORDS VERIFIED</b> (check all that apply)				
1.	<b>O&amp;M Documents</b>			
	<input type="checkbox"/> O&M manual	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	<input type="checkbox"/> As-built drawings	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	<input type="checkbox"/> Maintenance logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	Remarks: <b>An O&amp;M manual, as-built drawings and maintenance logs for the current system were not available.</b>			
2.	<b>Site-Specific Health and Safety Plan</b>			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
	<input type="checkbox"/> Contingency plan/emergency response plan	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A
	Remarks: <b>Site-specific health and safety plans for the current system were not available.</b>			
3.	<b>O&amp;M and OSHA Training Records</b>			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
	Remarks: <b>Training records for the current system O&amp;M were not available.</b>			
4.	<b>Permits and Service Agreements</b>			
	<input type="checkbox"/> Air discharge permit	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Effluent discharge	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Waste disposal, POTW	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	<input type="checkbox"/> Other permits: _____	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A
	Remarks: <b>No permit is currently required for discharge of treated effluent to the sanitary sewer system.</b>			
5.	<b>Gas Generation Records</b>			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
	Remarks: _____			
6.	<b>Settlement Monument Records</b>			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input checked="" type="checkbox"/> N/A	
	Remarks: _____			
7.	<b>Ground Water Monitoring Records</b>			
	<input checked="" type="checkbox"/> Readily available	<input checked="" type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
	Remarks: <b>EHS Support submits semi-annual groundwater reports to EPA.</b>			
8.	<b>Leachate Extraction Records</b>			
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	<input type="checkbox"/> N/A	
	Remarks: <b>EHS Support keeps records of volume of water and leachate treated through the</b>			

<b>treatment system as well as volume of oil shipped off-site.</b>			
9.	<b>Discharge Compliance Records</b>		
	<input type="checkbox"/> Air	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
	<input checked="" type="checkbox"/> Water (effluent)	<input checked="" type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input type="checkbox"/> N/A
Remarks: <b>EHS Support samples effluent monthly but is not required to submit compliance reports since the discharge does not require a permit.</b>			
10.	<b>Daily Access/Security Logs</b>	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date <input checked="" type="checkbox"/> N/A
Remarks: _____			
<b>IV. O&amp;M COSTS</b>			
1.	<b>O&amp;M Organization</b>		
	<input type="checkbox"/> State in-house	<input type="checkbox"/> Contractor for state	
	<input type="checkbox"/> PRP in-house	<input checked="" type="checkbox"/> Contractor for PRP	
	<input type="checkbox"/> Federal facility in-house	<input type="checkbox"/> Contractor for Federal facility	
	<input type="checkbox"/> _____		
2.	<b>O&amp;M Cost Records</b>		
	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	
	<input checked="" type="checkbox"/> Funding mechanism/agreement in place	<input checked="" type="checkbox"/> Unavailable	
Original O&M cost estimate: _____ <input type="checkbox"/> Breakdown attached			
Total annual cost by year for review period if available			
	From: _____	To: _____	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: _____	To: _____	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: _____	To: _____	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
	From: _____	To: _____	_____ <input type="checkbox"/> Breakdown attached
	Date	Date	Total cost
3.	<b>Unanticipated or Unusually High O&amp;M Costs during Review Period</b>		
Describe costs and reasons: <b>Multiple releases occurred during the review period, which resulted in the need for major upgrades to the treatment system. An upgraded leachate treatment system is currently under construction.</b>			
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A			
<b>A. Fencing</b>			
1.	<b>Fencing Damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Gates secured <input type="checkbox"/> N/A

Remarks: <b>Landfill fence damaged along eastern perimeter. Several parts of the fence are overgrown with vegetation.</b>			
<b>B. Other Access Restrictions</b>			
1.	<b>Signs and Other Security Measures</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
Remarks: <b>Multiple signs are posted at the access gate to the Site perimeter (within the current construction zone) and at the access gate to the landfill itself. The current treatment system is also located within a locked fence.</b>			
<b>C. Institutional Controls (ICs)</b>			
1.	<b>Implementation and Enforcement</b>		
	Site conditions imply ICs not properly implemented	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Site conditions imply ICs not being fully enforced	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Type of monitoring (e.g., self-reporting, drive by): <b>walk through</b>		
	Frequency: <b>during routine monitoring</b>		
	Responsible party/agency: <b>PRP</b>		
	Contact <b>Mike Dever, Ashland, Inc.</b>	_____	_____
	Name	Title	Date
	Reporting is up to date	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Reports are verified by the lead agency	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Specific requirements in deed or decision documents have been met	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A
	Violations have been reported	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
	Other problems or suggestions: <input type="checkbox"/> Report attached		
2.	<b>Adequacy</b>		
	<input checked="" type="checkbox"/> ICs are adequate (with possible exceptions noted below)		
	<input type="checkbox"/> ICs are inadequate <input type="checkbox"/> N/A		
Remarks: <b>Groundwater use restrictions for downgradient properties may be needed.</b>			
<b>D. General</b>			
1.	<b>Vandalism/Trespassing</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No vandalism evident
Remarks: _____			
2.	<b>Land Use Changes On Site</b>		
	<input type="checkbox"/> N/A		
Remarks: <b>Concrete pads have been installed for the new treatment system; construction is ongoing.</b>			
3.	<b>Land Use Changes Off Site</b>		
	<input type="checkbox"/> N/A		
Remarks: <b>None</b>			
<b>VI. GENERAL SITE CONDITIONS</b>			
<b>A. Roads</b>	<input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
1.	<b>Roads Damaged</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Roads adequate <input type="checkbox"/> N/A
Remarks:			
<b>B. Other Site Conditions</b>			

Remarks: <b>Construction activities have resulted in reworking of the Site (outside of the landfill boundaries).</b>		
<b>VII. LANDFILL COVERS</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A		
<b>A. Landfill Surface</b>		
1.	<b>Settlement</b> (low spots) <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Settlement not evident Depth: _____
	Arial extent: _____ Remarks: _____	
2.	<b>Cracks</b> <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Cracking not evident Depths: _____
	Lengths: _____      Widths: _____ Remarks: _____	
3.	<b>Erosion</b> <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Erosion not evident Depth: _____
	Arial extent: _____ Remarks: _____	
4.	<b>Holes</b> <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Holes not evident Depth: _____
	Arial extent: _____ Remarks: _____	
5.	<b>Vegetative Cover</b> <input checked="" type="checkbox"/> Grass <input checked="" type="checkbox"/> Cover properly established	
	<input checked="" type="checkbox"/> No signs of stress <input type="checkbox"/> Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: <b>The landfill cover needs mowing and treatment for invasive species, as needed.</b>	
6.	<b>Alternative Cover</b> (e.g., armored rock, concrete)	<input type="checkbox"/> N/A
	Remarks: _____	
7.	<b>Bulges</b> <input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> Bulges not evident Height: _____
	Arial extent: _____ Remarks: _____	
8.	<b>Wet Areas/Water Damage</b> <input checked="" type="checkbox"/> Wet areas/water damage not evident	
	<input type="checkbox"/> Wet areas <input type="checkbox"/> Location shown on site map	Arial extent: _____
	<input type="checkbox"/> Ponding <input type="checkbox"/> Location shown on site map	Arial extent: _____
	<input type="checkbox"/> Seeps <input type="checkbox"/> Location shown on site map	Arial extent: _____
	<input type="checkbox"/> Soft subgrade <input type="checkbox"/> Location shown on site map	Arial extent: _____
	Remarks: _____	
9.	<b>Slope Instability</b> <input type="checkbox"/> Slides <input type="checkbox"/> Location shown on site map	
	<input checked="" type="checkbox"/> No evidence of slope instability	
	Arial extent: _____	
	Remarks: <b>No evidence of slop instability was observed on the landfill itself; however, slopes around the new treatment system area should be carefully monitored during construction for</b>	

<b>instability and the need for corrective action.</b>			
<b>B. Benches</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
Remarks: _____			
2.	<b>Bench Breached</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
Remarks: _____			
3.	<b>Bench Overtopped</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> N/A or okay
Remarks: _____			
<b>C. Letdown Channels</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A (Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b> (Low spots)	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of settlement
Aerial extent: _____		Depth: _____	
Remarks: _____			
2.	<b>Material Degradation</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of degradation
Material type: _____		Aerial extent: _____	
Remarks: _____			
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of erosion
Aerial extent: _____		Depth: _____	
Remarks: _____			
4.	<b>Undercutting</b>	<input type="checkbox"/> Location shown on site map	<input checked="" type="checkbox"/> No evidence of undercutting
Aerial extent: _____		Depth: _____	
Remarks: _____			
5.	<b>Obstructions</b>	Type: _____	<input checked="" type="checkbox"/> No obstructions
<input type="checkbox"/> Location shown on site map		Aerial extent: _____	
Size: _____			
Remarks: _____			
6.	<b>Excessive Vegetative Growth</b>	Type: _____	
<input type="checkbox"/> No evidence of excessive growth			
<input checked="" type="checkbox"/> Vegetation in channels does not obstruct flow			
<input type="checkbox"/> Location shown on site map		Aerial extent: _____	
Remarks: <b>Excessive vegetative growth in the channels should be removed.</b>			

<b>D. Cover Penetrations</b>		<input checked="" type="checkbox"/> Applicable	<input type="checkbox"/> N/A
1.	<b>Gas Vents</b>	<input type="checkbox"/> Active	<input type="checkbox"/> Passive
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input checked="" type="checkbox"/> N/A
Remarks: _____			
2.	<b>Gas Monitoring Probes</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> Good condition
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Needs maintenance
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input checked="" type="checkbox"/> N/A
Remarks: _____			
3.	<b>Monitoring Wells</b> (within surface area of landfill)		
	<input checked="" type="checkbox"/> Properly secured/locked	<input checked="" type="checkbox"/> Functioning	<input checked="" type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
Remarks: _____			
4.	<b>Extraction Wells Leachate</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> Good condition
	<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Routinely sampled	<input type="checkbox"/> Needs maintenance
	<input type="checkbox"/> Evidence of leakage at penetration	<input type="checkbox"/> Needs maintenance	<input checked="" type="checkbox"/> N/A
Remarks: _____			
5.	<b>Settlement Monuments</b>	<input type="checkbox"/> Located	<input type="checkbox"/> Routinely surveyed
Remarks: _____			
<b>E. Gas Collection and Treatment</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Gas Treatment Facilities</b>	<input type="checkbox"/> Thermal destruction	<input type="checkbox"/> Collection for reuse
	<input type="checkbox"/> Flaring	<input type="checkbox"/> Needs maintenance	
Remarks: _____			
2.	<b>Gas Collection Wells, Manifolds and Piping</b>		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance	
Remarks: _____			
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings)		
	<input type="checkbox"/> Good condition	<input type="checkbox"/> Needs maintenance	<input type="checkbox"/> N/A
Remarks: _____			
<b>F. Cover Drainage Layer</b>		<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	<b>Outlet Pipes Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks: _____			
2.	<b>Outlet Rock Inspected</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
Remarks: _____			



<b>G. Detention/Sedimentation Ponds</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Siltation</b>	Area extent: _____	Depth: _____ <input type="checkbox"/> N/A
	<input type="checkbox"/> Siltation not evident		
	Remarks: _____		
2.	<b>Erosion</b>	Area extent: _____	Depth: _____
	<input type="checkbox"/> Erosion not evident		
	Remarks: _____		
3.	<b>Outlet Works</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks: _____		
4.	<b>Dam</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks: _____		
<b>H. Retaining Walls</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Deformations</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Deformation not evident
	Horizontal displacement: _____	Vertical displacement: _____	
	Rotational displacement: _____		
	Remarks: _____		
2.	<b>Degradation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Degradation not evident
	Remarks: _____		
<b>I. Perimeter Ditches/Off-Site Discharge</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Siltation</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Siltation not evident
	Area extent: _____	Depth: _____	
	Remarks: _____		
2.	<b>Vegetative Growth</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> N/A
	<input type="checkbox"/> Vegetation does not impede flow		
	Area extent: _____	Type: _____	
	Remarks: _____		
3.	<b>Erosion</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Erosion not evident
	Area extent: _____	Depth: _____	
	Remarks: _____		
4.	<b>Discharge Structure</b>	<input type="checkbox"/> Functioning	<input type="checkbox"/> N/A
	Remarks: _____		
<b>VIII. VERTICAL BARRIER WALLS</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A			
1.	<b>Settlement</b>	<input type="checkbox"/> Location shown on site map	<input type="checkbox"/> Settlement not evident
	Area extent: _____	Depth: _____	

Remarks: _____	
2. <b>Performance Monitoring</b>	Type of monitoring: _____
<input type="checkbox"/> Performance not monitored	
Frequency: _____	<input type="checkbox"/> Evidence of breaching
Head differential: _____	
Remarks: _____	
<b>IX. GROUND WATER/SURFACE WATER REMEDIES</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
<b>A. Ground Water Extraction Wells, Pumps and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1. <b>Pumps, Wellhead Plumbing and Electrical</b>	
<input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs maintenance <input checked="" type="checkbox"/> N/A	
Remarks: _____	
2. <b>Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances</b>	
<input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	
Remarks: _____	
3. <b>Spare Parts and Equipment</b>	
<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided	
Remarks: _____	
<b>B. Surface Water Collection Structures, Pumps and Pipelines</b> <input type="checkbox"/> Applicable <input checked="" type="checkbox"/> N/A	
1. <b>Collection Structures, Pumps and Electrical</b>	
<input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	
Remarks: _____	
2. <b>Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances</b>	
<input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance	
Remarks: _____	
3. <b>Spare Parts and Equipment</b>	
<input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided	
Remarks: _____	
<b>C. Treatment System</b> <input checked="" type="checkbox"/> Applicable <input type="checkbox"/> N/A	
1. <b>Treatment Train</b> (check components that apply)	
<input type="checkbox"/> Metals removal <input checked="" type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation	
<input type="checkbox"/> Air stripping <input checked="" type="checkbox"/> Carbon adsorbers	
<input checked="" type="checkbox"/> Filters: <u>bag</u>	
<input type="checkbox"/> Additive (e.g., chelation agent, flocculent): _____	

<input checked="" type="checkbox"/> Others: <u>organoclay</u> <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of ground water treated annually: _____ <input type="checkbox"/> Quantity of surface water treated annually: _____ Remarks: <b>Treatment system trailer was locked; unable to access interior</b>	
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: <b>Backup generator installed within the last five years; unable to view interior electrical panel due to locked trailer</b>
3.	<b>Tanks, Vaults, Storage Vessels</b> <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs maintenance Remarks: <b>Backup overflow tanks with temporary secondary containment installed within the last five years; no secondary containment for oil/water separator</b>
4.	<b>Discharge Structure and Appurtenances</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs maintenance Remarks: <b>Unable to view</b>
5.	<b>Treatment Building(s)</b> <input type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input checked="" type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks: <b>Unable to gain access to interior of the current treatment building. Multiple drums of spent carbon and oil are awaiting disposal on the gravel area outside the treatment building without adequate containment. A small pile of contaminated soil, covered in plastic sheeting, from a manhole repair is also awaiting off-site disposal. A new treatment plant is under currently under construction.</b>
6.	<b>Monitoring Wells</b> (pump and treatment remedy) <input checked="" type="checkbox"/> Properly secured/locked <input checked="" type="checkbox"/> Functioning <input checked="" type="checkbox"/> Routinely sampled <input checked="" type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs maintenance <input type="checkbox"/> N/A Remarks: _____
<b>D. Monitoring Data</b>	
1.	<b>Monitoring Data</b>

<input checked="" type="checkbox"/> Is routinely submitted on time	<input checked="" type="checkbox"/> Is of acceptable quality
2. <b>Monitoring Data Suggests:</b>	
<input type="checkbox"/> Ground water plume is effectively contained	<input checked="" type="checkbox"/> Contaminant concentrations are declining
<b>E. Monitored Natural Attenuation</b>	
1. <b>Monitoring Wells</b> (natural attenuation remedy)	
<input type="checkbox"/> Properly secured/locked	<input type="checkbox"/> Functioning
<input type="checkbox"/> All required wells located	<input type="checkbox"/> Needs maintenance
	<input type="checkbox"/> Routinely sampled
	<input type="checkbox"/> Good condition
	<input type="checkbox"/> N/A
Remarks: _____	
<b>X. OTHER REMEDIES</b>	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
<b>XI. OVERALL OBSERVATIONS</b>	
<b>A. Implementation of the Remedy</b>	
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <b>The major objectives of the remedy were to contain the Site by capping the landfill to prevent direct contact and capture and treat landfill leachate. The current groundwater/leachate treatment system is inadequate. Peak rain events overwhelm the treatment system. In the past five years, multiple releases have occurred at the Site as a result of system inadequacies. The PRP has redesigned a higher capacity treatment system and it is currently under construction at the Site.</b>	
<b>B. Adequacy of O&amp;M</b>	
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <b>O&amp;M procedures for the current system are inadequate. An O&amp;M plan for the current system is not in place, and there is no regular monitoring of the system. The PRP is anticipated to correct these issues once construction of the redesigned treatment system is complete and O&amp;M plans are updated.</b>	
<b>C. Early Indicators of Potential Remedy Problems</b>	
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <b>The PRP is working to construct a new treatment system to address the undersized current system.</b>	
<b>D. Opportunities for Optimization</b>	
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <b>Opportunities for optimization will be evaluated after construction of the new treatment system.</b>	

Site inspection participants:

- Bob Wallace, EPA RPM
- Trish Taylor, EPA CIC
- Chris Mondia, EPA CIC's contractor
- Mike Dever, Ashland, Inc.
- Scott Lindenmuth, EHS Support (PRP contractor)
- Ernie Sanchez, Clean Harbor (PRP remedial action contractor)
- Scott McDougall, PADEP
- Norma Ruffing and two additional representatives, Alleghany County Health Department
- Jill Billus, Skeo Solutions
- Johnny Zimmerman-Ward, Skeo Solutions

## Appendix E: Photographs from Site Inspection Visit



Gated entrance to construction area of Site



Concrete slabs and retaining wall for new leachate treatment system



Slumped slope behind retaining wall



Concrete slab for new treatment system tanks



Concrete slab and retaining wall for new treatment system



Slumped slope located across the access road from the current leachate treatment system



Signs outside the current leachate treatment system enclosure



Fence that surrounds the OWS





Backup tanks for the current leachate treatment system



OWS



Activated carbon units, OWS and backup generator



Valve before OWS to bypass to backup tanks, if needed



Locked aqueous phase treatment system trailer



Drums of spent carbon and oil staged outside the treatment system enclosure



Drums of spent carbon from the aqueous phase treatment system



Covered contaminated soil pile generated during manhole replacement



Access road with locked gate to landfill



Landfill drainage channel



Birdboxes installed within capped area; fence along landfill boundaries in the distance



Access road on landfill cap; view of rain gauge in distance



View of landfill cap looking downslope toward the leachate treatment system



Flushmount well near OWS



Sediment filter socks in the unnamed stream on site



View of the treatment system enclosure on September 23, 2015.





View of the treatment system enclosure interior during the September 2015 site visit



View of the retaining wall and slope adjacent to the new treatment system enclosure at the time of the September 2015 site visit

## Appendix F: Risk Assessment Analysis in Support of Question B

### Changes in Standards and TBCs

*Have standards identified in the ROD been revised and does this call into question the protectiveness of the remedy? Do newly promulgated standards call into question the protectiveness of the remedy? Have TBCs used in selecting cleanup levels at the site changed, and could this affect the protectiveness of the remedy?*

Decision documents cite MCLs as ARARs for groundwater. The OU1 and OU2 RODs did not list specific MCLs in effect at the time of the decision documents, so this evaluation reviewed the MCLs referenced in the February 2014 Resins Disposal Site Biannual Groundwater Monitoring and Product Recovery Report. The MCLs for benzene, toluene, ethylbenzene and xylenes (four of the five currently monitored indicator compounds) have not changed since the last FYR and therefore remain valid. The fifth monitored compound, naphthalene, does not have an MCL, and therefore under the NCP, its goal should be a risk-based standard [40 CFR 300.430(e)(2)(i)(A)(2)]. A cleanup goal for naphthalene in groundwater has not been established for the Site.

To estimate current risk at the Site, a screening level risk evaluation using recent groundwater data and updated toxicity criteria was conducted. If the groundwater was to be used at wells TW-13 and TW-14 (the only two wells included in LTGM), the risk evaluation demonstrates that the risk would exceed the upperbound of EPA's risk management range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  as well as the noncancer threshold HI of 1.0 primarily due to naphthalene (Table 9). These results indicate that the groundwater monitored in TW-13 and TW-14 would not be protective at current concentrations. However, this water is not currently consumed and institutional controls are in place to prevent the use of this water at the Site. Additional institutional controls downgradient of these wells may be warranted to prevent use of this water should it migrate off site.

**Table F-1: Summary of Screening Level Risk for Residential Use of TW-13 and TW-14**

Well	Chemical	Contaminant Concentration 4Q2014 <sup>a</sup> (µg/L)	Residential RSL <sup>b</sup> (µg/L)		Screening Level Risk Evaluation Residential	
			Based on $1 \times 10^{-6}$ Risk	Based on Noncancer Hazard Quotient (HQ)=1.0	Cancer Risk <sup>c</sup>	Noncancer HI <sup>d</sup>
TW-13	Benzene	<1	0.45	33	$2.2 \times 10^{-6}$	0.03
	Ethylbenzene	<1	1.5	810	$6.7 \times 10^{-7}$	0.001
	Naphthalene	35	0.17	6.1	$2.1 \times 10^{-4}$	5.7
	Toluene	<1	NE	1,100	NE	0.001
	Total Xylenes	<2	NE	190	NE	0.005
Total					<b><math>2.0 \times 10^{-4}</math></b>	<b>5.8</b>
TW-14	Benzene	29	0.45	33	$6.4 \times 10^{-5}$	0.88
	Ethylbenzene	150	1.5	810	$1.0 \times 10^{-4}$	0.18
	Naphthalene	470	0.17	6.1	$2.8 \times 10^{-3}$	77
	Toluene	11	NE	1,100	NE	0.01

Well	Chemical	Contaminant Concentration 4Q2014 <sup>a</sup> (µg/L)	Residential RSL <sup>b</sup> (µg/L)		Screening Level Risk Evaluation Residential	
			Based on 1 x 10 <sup>-6</sup> Risk	Based on Noncancer Hazard Quotient (HQ)=1.0	Cancer Risk <sup>c</sup>	Noncancer HI <sup>d</sup>
	Total Xylenes	140	NE	190	NE	0.74
Total					<b><i>2.9 x 10<sup>-3</sup></i></b>	<b><i>79</i></b>
<p>a. Obtained from Table 3 from the February 2014 Resins Disposal Site Biannual Groundwater Monitoring and Product Recovery Report</p> <p>b. EPA RSLs June 2015 obtained at <a href="http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm">http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm</a> (accessed June 18, 2015)</p> <p>c. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10<sup>-6</sup> risk:  Cancer risk = (4Q2014 concentration ÷ Tap water risk-based RSL) × 10<sup>-6</sup></p> <p>d. The noncancer hazard index was calculated using the following equation:  Hazard Index = (4Q2014 concentration ÷ Tap Water Non-cancer RSL)</p> <p>NE = EPA has not classified this compound as a carcinogen  &lt; = contaminant not detected; level presented is the detection limit  <b><i>Bold italic</i></b> – cancer risk exceeds 1 x 10<sup>-4</sup> or a noncancer HI of 1.0</p>						

### **Changes in Exposure Pathways**

*Has land use or expected land use on or near the site changed? Have human health or ecological routes of exposure or receptors been newly identified or changed in a way that could affect the protectiveness of the remedy? Are there newly identified contaminants or contaminant sources? Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents? Have physical site conditions or the understanding of these conditions changed in a way that could affect the protectiveness of the remedy?*

Land use at and near the Site has not changed since the last FYR except for the addition of concrete foundations at the Site for the new leachate treatment system.

During the 2010 FYR, it was determined that a residence adjacent to the Site was using a private well (RW-4) but not for drinking water. To assess current concentrations in the well, the PRP sampled RW-4 in 2014. The only chemicals detected in the primary and duplicate samples were acetone, at 24 µg/L and 22 µg/L, respectively, and 2-butanone at 2.4 µg/L and 1.7 µg/L, respectively. Neither chemical is associated with site waste materials; however, to be conservative, the detected concentrations were evaluated in a screening-level risk evaluation (Table F-2). The detected concentrations of acetone and 2-butanone result in a noncancer HI well below 1.0 indicating that the concentrations are currently protective for potable use. Continued monitoring is recommended to ensure concentrations do not change.

**Table F-2: Summary of Screening Level Risk for Residential Use of RW-4**

Well	Chemical	Contaminant Concentration October 2014 <sup>a</sup> (µg/L)	Residential RSL <sup>b</sup> (µg/L)		Screening Level Risk Evaluation Residential	
			Based on 1 x 10 <sup>-6</sup> Risk	Based on Noncancer HQ=1.0	Cancer Risk <sup>c</sup>	Noncancer HI <sup>d</sup>
TW-13	Acetone	24	NE	14,000	NE	0.002
	2-Butanone	2.4	NE	5,600	NE	0.0004
Total					NE	0.002
<p>a. Laboratory results obtained from EPA on June 18, 2015</p> <p>b. EPA RSLs June 2015 obtained at <a href="http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm">http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm</a> (accessed June 18, 2015)</p> <p>c. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10<sup>-6</sup> risk:  Cancer risk = (October 2014 concentration ÷ Tap water risk-based RSL) × 10<sup>-6</sup></p> <p>d. The noncancer hazard index was calculated using the following equation:  Hazard Index = (October 2014 concentration ÷ Tap Water Non-cancer RSL)</p> <p>NE = EPA has not classified this compound as a carcinogen</p>						

The 2010 FYR recommended the PRP perform a vapor intrusion assessment of nearby residences in the vicinity of monitoring wells TW-13 and TW-14. However, soil vapor samples could not be collected due to the presence of high soil-vacuum conditions as a result of tight native soils above the bedrock contact. As part of this FYR, a screening-level risk evaluation of the vapor intrusion pathway was conducted using the most current groundwater data collected from wells closest to residential areas, TW-13, northwest of the landfill and TW-14 southwest of the landfill. Data from residential well RW-4 were also used. Consistent with EPA guidance, the vapor intrusion pathway was initially evaluated by determining if VOCs are present in the subsurface. Historic and recent sampling results indicate that groundwater samples have detected VOCs.

EPA’s vapor intrusion screening level (VISL) calculator was used to provide a conservative estimate of risk and noncancer hazards. The VISL calculator is an empirical model that predicts indoor air concentrations using conservative “generic” attenuation factors. These factors reflect worst-case conditions and do not take into account any site-specific conditions such as site soil strata, depth to water table and building properties that may reduce the transport of vapors from groundwater through the soil column. The VISL calculator was run in default mode, which assumes a groundwater temperature of 25 degrees Celsius (77 degrees Fahrenheit). This is a conservative assumption for Pennsylvania groundwater, which is on average 11 degrees Celsius, as outlined in EPA’s vapor intrusion guidance.<sup>1</sup>

The VISL calculator was run for TW-13, TW-14 and RW-4 using the most current results. As shown in Table F-1, the hypothetical residential cancer risk associated with the 2013 concentration in TW-13 is well within EPA’s risk management range of 1 x 10<sup>-6</sup> to 1 x 10<sup>-4</sup> and the noncancer HI is below 1.0. The screening level risk and HI are much higher at TW-14 primarily due to the presence of naphthalene at elevated concentrations resulting in a screening-level risk slightly greater than 1 x 10<sup>-4</sup> and a HI greater than 1. The noncancer HI associated with

<sup>1</sup> User’s Guide for Evaluating Subsurface Vapor Intrusion into Buildings. EPA’s Office of Emergency and Remedial Response. February 2004.

acetone and 2-butanone detections at residential well RW-4 is well below 1 with no carcinogenic risk identified.

**Table F-3. Evaluation of Vapor Intrusion Using the VISL Calculator**

Well	Chemical	4Q2014 <sup>a</sup> Concentration (µg/L)	Residential <sup>b</sup>	
			Cancer Risk	Noncancer HI
TW-13	Benzene	<1	6.3 x 10 <sup>-7</sup>	0.007
	Ethylbenzene	<1	2.9 x 10 <sup>-7</sup>	0.0003
	Naphthalene	35	7.6 x 10 <sup>-6</sup>	0.2
	Toluene	<1	NE	0.0001
	Total Xylenes	<2	NE	0.21
Total			8.5 x 10 <sup>-6</sup>	0.206
TW-14	Benzene	29	1.8 x 10 <sup>-5</sup>	0.21
	Ethylbenzene	150	4.3 x 10 <sup>-5</sup>	0.05
	Naphthalene	470	1.0 x 10 <sup>-4</sup>	2.7
	Toluene	11	NE	0.0006
	Total Xylenes	140	NE	0.28
Total			1.6 x 10 <sup>-4</sup>	3.2
RW-4	Acetone	24	NE	1.1 x 10 <sup>-6</sup>
	2-Butanone (MEK)	2.4	NE	1.1 x 10 <sup>-6</sup>
Total			NE	2.2 x 10 <sup>-6</sup>
<p>a. Obtained from Table 3 from the February 2014 Resins Disposal Site Biannual Groundwater Monitoring and Product Recovery Report. RW-4 data obtained from October 2014 TestAmerica Laboratories, Inc. Analytical Report.</p> <p>b. Risks and HI calculated using the EPA's VISL calculator Version 3.4 obtained at <a href="http://www.epa.gov/oswer/vaporintrusion/guidance.html">http://www.epa.gov/oswer/vaporintrusion/guidance.html</a> (accessed June 18, 2015).</p> <p>NE = EPA has not classified this compound as a carcinogen.</p> <p>&lt; = contaminant not detected; level presented is the detection limit.</p> <p><b><i>Bold italic</i></b> – cancer risk exceeds 1 x 10<sup>-4</sup> or a noncancer HI of 1.0.</p>				

These data, along with the uncertainties in evaluating this pathway, confirm the need to further evaluate this pathway with multiple lines of evidence as recommended by EPA's recently released June 2015 vapor intrusion guidance.<sup>2</sup> The uncertainties include the presence of mine voids across the Site, fractured nature of the subsurface and the close proximity of homes down slope of the Site. Additional groundwater data in the vicinity of the downgradient residences is necessary to determine if vapor intrusion sampling is necessary.

Changes in Toxicity and Other Contaminant Characteristics

Toxicity factors have changed since the original risk assessment, as have risk assessment methods. For example, assessments of PAHs now include an evaluation of mutagenicity, and the risk assessment guides for dermal and inhalation exposures have changed. To evaluate the current and future protectiveness, the following risks were considered:

- Risks from current groundwater concentrations in monitoring wells (using concentrations from the 4Q2014 data).
- Risks from current groundwater concentrations in a local residential well (RW-4).

<sup>2</sup> Office of Solid Waste and Emergency Response Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air. June 2015.

- Screening-level risks from vapor intrusion.

Results from these evaluation are discussed above.

#### Changes in Risk Assessment Methods

There have been significant changes in EPA's risk assessment guidance since the original risk assessment was performed. These include changes in basic methodology, dermal guidance, inhalation methodologies and exposure factors. Risks were estimated using current methodology; those estimated are discussed above.

#### Expected Progress Toward Meeting RAOs

EPA has compiled a list of recommendations in Section 9.0 to better determine protectiveness at the Site.