Explanation of Significant Differences
Record of Decision
Ravenswood PCE Superfund Site

I. Introduction

Site Name:	Ravenswood PCE Superfund Site
Site Location:	City of Ravenswood, Jackson County, West Virginia
Lead Agency:	U.S. Environmental Protection Agency
Support Agency:	West Virginia Department of Environmental Protection

II. Statement of Purpose

This Explanation of Significant Differences ("ESD") for the Ravenswood PCE Superfund Site ("Site") is being issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9617(c), and Section 300.435(c)(2)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan ("NCP"), 40 C.F.R. § 300.435(c)(2)(ii). CERCLA and the NCP require EPA to issue an ESD when modifications to a final remedial action plan, as selected in a Record of Decision ("ROD"), are necessary, and such modifications significantly change, but do not fundamentally alter, the selected remedial action with respect to scope, performance or cost. The United States Environmental Protection Agency ("EPA") is issuing this ESD because EPA will be modifying the remedial action selected in the May 23, 2011 ROD for the Site ("2011 ROD") to include long-term sampling and monitoring for vapor intrusion in several commercial buildings and residences at the Site. EPA previously intended to address vapor intrusion as a separate Operable Unit at the Site (i.e., proposed "Operable Unit 2").[1] However, as described in greater detail below, recent sampling results obtained by EPA as part of the groundwater cleanup at the Site (i.e., "Operable Unit 1" or "OU1") have shown that the groundwater cleanup has significantly reduced the levels of volatile organic compounds ("VOCs") in the sub-slab and indoor air of buildings at the Site. As a result, EPA has determined that a separate cleanup decision for vapor intrusion is no longer necessary, and that vapor intrusion at the Site can be

[1] EPA uses the term "vapor intrusion" to refer to releases of volatile chemicals that may migrate from subsurface soils or groundwater into existing or proposed buildings.

addressed by the continued operation of the groundwater remedial action and by a modification to the remedial action to include long-term sampling and monitoring.

EPA's decision to issue this ESD is based on the Administrative Record in accordance with CERCLA and the NCP. The documents that form the basis for EPA's issuance of this ESD, as well as the ESD itself, have been incorporated into the Administrative Record in accordance with Section 300.825(a)(2) of the NCP, 40 C.F.R. § 300.825(a)(2). Copies of the Administrative Record file are located in the Jackson County Library in Ravenswood, at the EPA Region III Records Center in Philadelphia, Pennsylvania, and online at https://semspub.epa.gov/src/collection/03/AR61829.

The overall goals of the remedial action selected in the 2011 ROD remain the same: to prevent exposure to contaminated groundwater, to prevent further migration of groundwater contaminants and to restore the aquifer to beneficial use. As discussed below, this ESD changes, but does not fundamentally alter, the remedy selected in the 2011 ROD with respect to scope, performance or cost.

III. Site Background and History of Contamination

A. Site Background

The Site (CERCLIS Identification No. WVSFN0305428) is located in the City of Ravenswood, Jackson County, West Virginia ("City"). The Site generally includes the downtown area of Ravenswood, which is underlain by groundwater contaminated with tetrachloroethene, which is also known as perchloroethylene or PCE.

The PCE plume extends from the intersection of Broadway Street and Walnut Street approximately 1,400 feet northeast to the City of Ravenswood water supply well field located adjacent to Virginia Street. This well field currently includes seven production wells ("PW") known as PW-1 to PW-7, which supply water to approximately 7,100 people.

B. History of Contamination and Response

In September 1989, during routine health department water analysis, PCE contamination was detected in the City's production wells PW-2, PW-3 and PW-5 at levels exceeding the Maximum Contaminant Level ("MCL") for PCE in drinking water which is 5 micrograms per liter ("5μg/L") as set forth at 40 C.F.R. § 141.61. MCLs are the standards for drinking water established by the Safe Drinking Water Act, 42 U.S.C. § 300g-l. PCE concentrations that exceeded the MCL were detected five times from 1989-1998 in the finished water that was distributed to the public. Following the identification of PCE in the drinking water supply, various Site investigations took place during the period between 1998 and 2010. [2]

In 2004, EPA added the Site to the final National Priorities List ("NPL").

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[2] For more detailed descriptions of EPA's investigations and response actions at the Site, please see Section II.B.2 of the 2011 ROD, which is included in the Administrative Record file for this ESD

In November 2008, as part of the Remedial Investigation ("RI"), EPA initiated a Treatability Study ("TS") at the Site to provide engineering data to support a final remedy decision for OU1 of the Site. Air sparging with soil vapor extraction ("AS/SVE"), a remediation technology that injects air into the groundwater and then vacuums contaminants away, was evaluated due to its operational success at the similar Vienna PCE Superfund Site in Vienna, West Virginia. In November 2008, fifteen wells were installed as part of the AS/SVE system study. The system included: nine air sparging wells, three soil vapor extraction wells, two groundwater monitoring wells and one vapor monitoring well. An AS/SVE system was moved from the Vienna PCE Site and was installed at the Ravenswood PCE Site in June 2009.

The air sparging wells inject air into the water table which volatilizes the PCE (changes PCE from an aqueous phase to a vapor phase). The volatilized PCE then moves upward into the vadose zone (the area extending from the top of the groundwater to the land surface). The PCE is then captured by the soil vapor extraction wells. The soil vapor extraction wells work by creating a vacuum in the vadose zone. The PCE vapors captured by these wells are transported via piping to a vapor-phase granular activated carbon ("VPGAC") unit which is located in the TS building. The VPGAC works as a filter to remove the PCE from the air. The treated air is then discharged to the atmosphere.

Operation of the TS system was conducted in phases. This allowed EPA to gather enough sampling data to ensure that the vapor extraction system captured all PCE vapors and that no risk from PCE vapors was created from operating the system. In June 2009, the soil vapor extraction system was activated which resulted in the removal of any existing PCE vapors from the subsurface. Sampling was conducted of the SVE system frequently during the first month of the SVE system operation. Once the vapor data confirmed that there were not high levels of PCE in the subsurface, the AS system was phased into operation.

Groundwater sampling was also conducted as part of the TS and it began with a baseline sampling event during the AS/SVE installation in November and December 2008. Samples were collected from thirteen monitoring wells and the seven City production wells, along with screening level samples taken during the well installations for the AS/SVE system. The highest PCE concentration identified during this sampling effort came from a sample collected from an air sparging well, AS-02, where PCE was detected at 210µg/L. The highest detection from a monitoring well, 370µg/L, came from DEP-05S. Samples from the monitoring wells were collected again in September 2009, February 2010, and May 2010, as part of the TS system operation.

In May 2010, PCE levels in DEP-05S had been reduced to 96µg/L, showing effectiveness of the AS/SVE in removing PCE. All of the results from the sampling events are included in the Administrative Record, available at https://semspub.epa.gov/src/collection/03/AR61829,

EPA issued the ROD for the groundwater cleanup on May 23, 2011, selecting, among other things, continued operation of the AS/SVE system set in place during the TS as the remedial action for OU1 of the Site. Additional details about the ROD are discussed below.

IV. Description of ROD and Remedy Implementation

A. Description of ROD

The decision by EPA on the remedial action to be implemented at OU1 of the Site is presented in the 2011 ROD. The remedial action objectives of the selected remedy are:

- Prevention of human exposure, including ingestion, inhalation, and dermal contact, by current and future residents and industrial workers to contaminated groundwater that exceeds EPA's acceptable level of risk of $1x10^{-4}$;
- Prevention of down-gradient and offsite migration of contaminants in the groundwater to the Ohio River and Sandy Creek; and
- Restoration of contaminated groundwater to meet the ARAR which is the Maximum Contaminant Level ("MCL").

The major components of the selected remedy as outlined in the 2011 ROD are:

- In-Situ Air Sparging with Soil Vapor Extraction ("AS/SVE"), which included the continued operation of the AS/SVE system put in place for the TS, monitoring of vapors, and an expansion of AS and SVE wells in areas that would effectively treat all contamination;
- Groundwater monitoring which may require the installation and monitoring of additional wells, throughout the contaminated groundwater plume, as well as near the Ohio River;
- Continued well-head treatment (stripping system), as needed, on the City's contaminated production wells prior to distribution;
- A Pre-Remedial Design Investigation ("PRDI") to ensure the proper placement of the air sparging and soil vapor extraction wells; and
- Institutional Controls ("ICs") to prevent the installation of new production wells in the contaminated portion of the aquifer. ICs were achieved on June 6, 2017, when the City added an article to an existing ordinance (§ 52.07 of the City of Ravenswood Code of Ordinances) to prohibit the construction, digging, or drilling of groundwater wells within City limits.

B. Remedy Implementation

1. Pre-Remedial Design Investigation

In 2012 EPA conducted a PRDI to support development of Remedial Design ("RD") for the cleanup of OU1 of the Site. The purpose of the investigation was to further refine the location of the PCE plume and locate any contaminant source(s). The investigation included the

installation of 30 borings to depths of 30 feet below ground surface ("bgs"), collection of 60 soil samples from these borings, installation of 4 groundwater monitoring wells, collection and analysis of 16 groundwater samples from all new and existing groundwater wells, as well as exploratory vapor intrusion sampling.

During the PRDI, two potential PCE source areas were identified near the former dry cleaning facility at 120 Washington Street. Soil contamination was found in the grassy area behind the building at 120 Washington Street and along the alley adjacent to this building, as well as along the City sanitary sewer system along Walnut Street between Washington and Race streets (Figure 1.3). PCE was detected in all soil samples collected from behind the 120 Washington Street building at depths from surface to 26 feet bgs. PCE was also detected in the soil samples collected near the manholes of the sanitary sewer exiting the 120 Washington Street facility. It is likely releases occurred to surface and subsurface soils and to the sanitary sewer system as a result of dry cleaning equipment maintenance practices (e.g., filter and solvent changes) during operations at the facility.

Soil samples were also collected at a former dry cleaning facility at 220 Washington Street. PCE was detected in one of the eight subsurface soil samples collected at this address. The area behind the 220 Washington Street building is paved; therefore, it is assumed that surface releases likely would have been transported off site by storm water and surface water discharges. However, since PCE was detected beneath the pavement, it is possible that a release occurred at the 220 Washington Street facility.

Groundwater sample results from the PRDI indicated that the groundwater plume extends from the source area (south of the intersection of Walnut and Washington streets) to PW-3 (Figure 1.2). A second, lower concentration "lobe" of the plume extends southwestward toward Broadway Street. The secondary lobe of the plume is consistent with the presumed contaminant release points and the groundwater model developed in the RI. That model indicates that a small portion of the contaminant mass from the source area could migrate westward to a hydraulic stagnation point between the influence of the City production well field and the Ohio River.

2. Construction of AS/SVE System

The RD for OU1 of the Site included an expansion of the former AS/SVE system put in place during the TS (hereafter referred to as "Treatment System 1" or "TS1") and the installation of a second treatment system ("TS2"). These two RD components are described below, and the layouts of TS2 and TS1 are presented in Figures 1.3 and 1.4, respectively.

- TS1 was expanded and modified to treat the northern portion of the PCE plume, in the area of the production well field. The RD specified modifications to the programming of the TS1 programmable logic controller ("PLC"), so it will be able to operate wells AS-1, AS-10, and AS-11 continuously, and wells AS-2, AS-3, AS-4, AS-5, AS-6, and AS-12 on a pulsed schedule. The RD also required the addition of three new AS wells, with conveyance piping, to improve the removal effectiveness of TS1.

- TS2 was designed to treat the southern portion of the plume, particularly the source areas behind the two former dry cleaners. The RD specified that the following components be included in TS2:

    - Five new SVE wells manifolded to a blower that will pull the recommended vacuum;
    - Ten new AS wells with a compressor to supply air to the wells at the appropriate pressure;
    - Subsurface conveyance piping;
    - A subsurface liner/vapor seal to improve recovery in the source area behind 220 Washington Street;
    - Off-gas treatment consisting of granular activated carbon ("GAC");
    - Condensate removal;
    - A PLC to control the operation and allow remote monitoring of the system; and
    - A treatment building to house the compressor, blower, GAC, PLC, and other treatment system components.

The TS2 well construction methods and locations are based on data collected from the RI, treatability study, and the PRDI. The operational strategy for TS2 described in the RD is based on field observations and data collected from the operation of TS1. In the remainder of this ESD, Treatment Unit 2 ("TU2") refers to the compressor, blower, control system, and other apparatus in the treatment building. TS2 includes TU2 as well as the associated piping and wells and the treatment building itself.

EPA used soil sample data collected during the PRDI to estimate contaminant concentrations in the system off-gas and evaluate vapor treatment requirements. Based on the maximum detected concentrations and the expected flow rate, the maximum expected discharge from TU2 is 0.012 pounds per hour ("lbs/hr"). Based on State air quality standards, off-gas treatment was not required (HGL, 2013).

Additional details on the design of the treatment systems can be found in the *Final Basis of Design Report* (HGL, 2013), which is included in the Administrative Record.

3. Institutional Control Implementation

Institutional Controls to prevent the installation of new production wells in the contaminated portion of the aquifer were achieved on June 6, 2017, when the City of Ravenswood amended a city ordinance prohibiting the digging or drilling of groundwater well within City limits.

4. System Operation/Operation and Maintenance/Groundwater Sampling

The two treatment systems at the Site, TS1 and TS2, are designed to work in concert with the City of Ravenswood public supply well field to remove PCE from soil and groundwater.

The primary short-term goal for the RA is mass removal of contaminants from soil and groundwater, especially from the source area. The TS2 system removed a total of 202 pounds of VOCs from the source area during the most recent reporting period (January to July 2016). A cumulative total of 612 pounds of VOCs have been removed since system startup. As observed during the reporting period, mass removal rates through SVE have declined significantly, indicating that at least some portion of the soil source has likely been removed. It is anticipated that the amount of contaminant mass removed in soil vapor will reach equilibrium with the contaminant mass being stripped from the groundwater by air sparging. At that point, rate of mass removal will be governed by the mass remaining in groundwater. As the systems continue operation, a steady decline in soil and groundwater VOC concentrations is expected in the source area. The system was declared "Operational and Functional" in August of 2016.

5. Vapor Intrusion

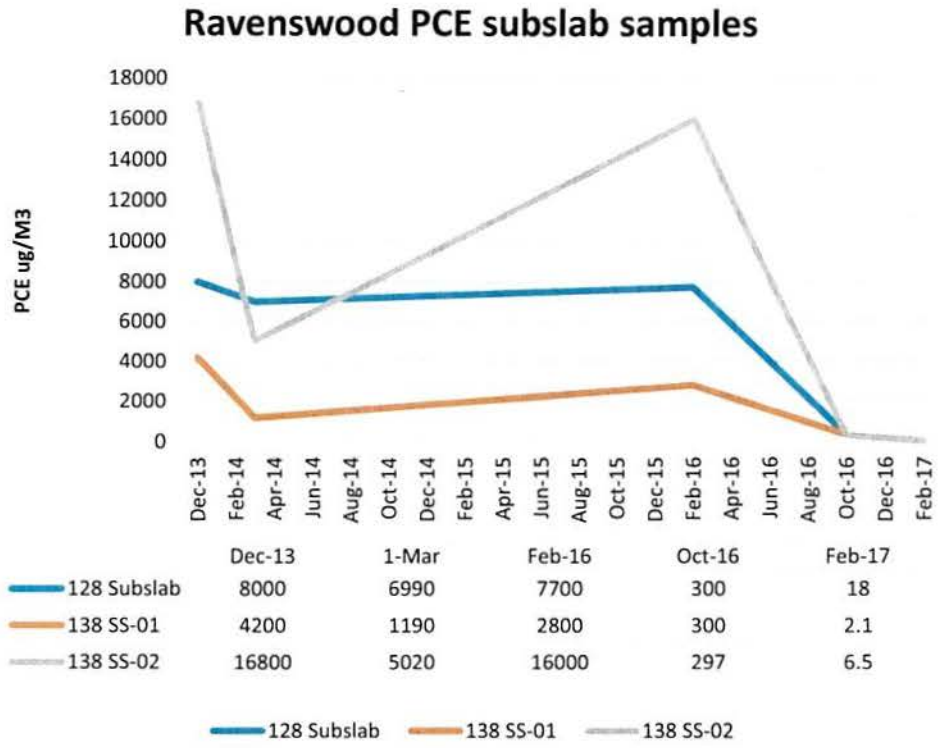
After the PRDI was completed, EPA began monitoring for vapor intrusion over the Site Groundwater Plume. In January of 2012, EPA began a series of annual sampling events specifically for vapor intrusion. During these initial sampling events, PCE was detected in at least one sample in each of the locations.

The detection of PCE in sub-slab soil vapor samples and indoor air samples suggested that vapor intrusion was occurring at some locations in Ravenswood. Specific results can be found in Tables 1 and 2. EPA returned annually to the Site to sample for vapor intrusion from 2013 through 2017.

Results of the vapor-intrusion sampling over time have shown significant reduction in the vapor intrusion concentrations of PCE. Results from sub-slab sampling at the suspected source areas have shown a decrease of PCE from 16,000 $\mu g/m^3$ to 6.5 $\mu g/m^3$ in one location and 7700 $\mu g/m^3$ to 18.0 $\mu g/m^3$ in another location. In addition, there have been no exceedances of risk-based numbers for indoor air over this sampling period.

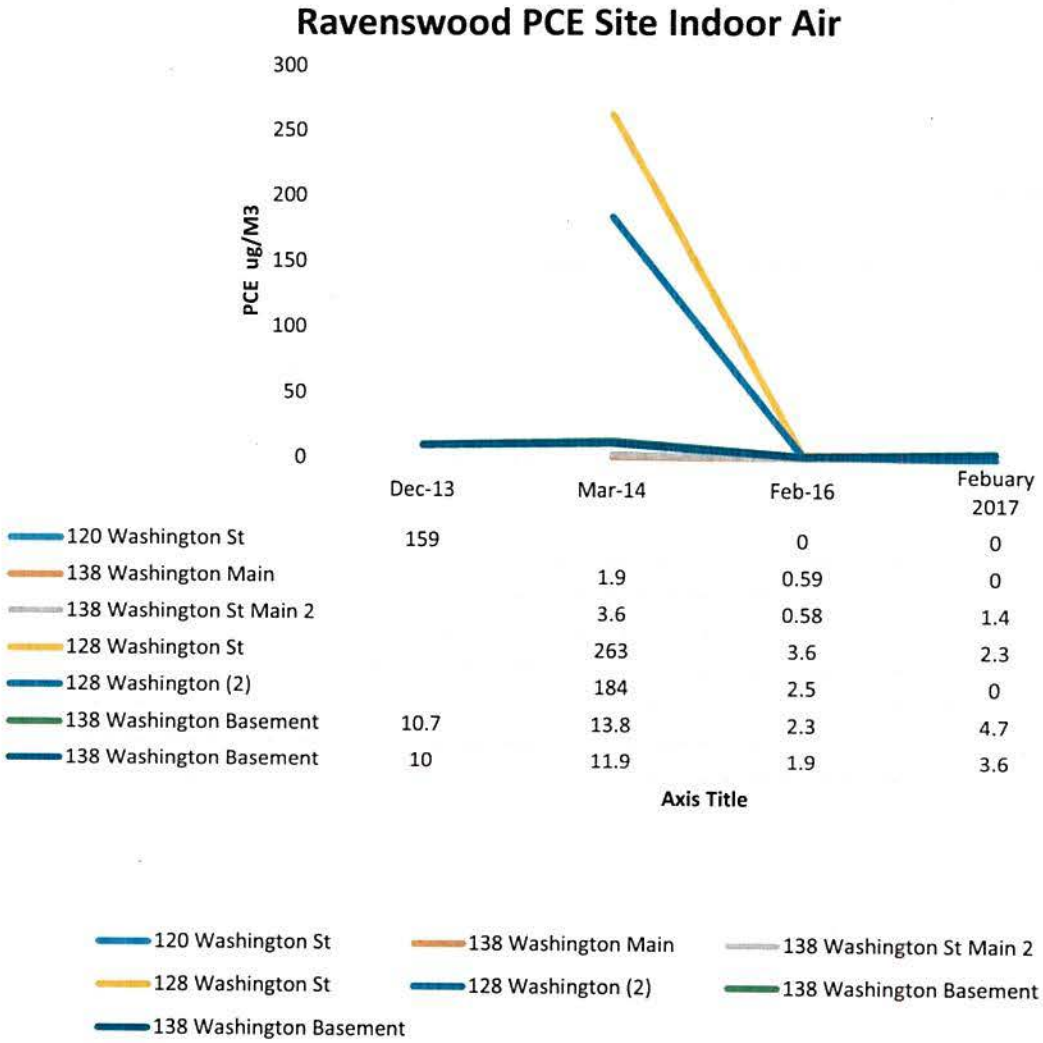
EPA attributes the decrease in vapor intrusion at the Site to the implementation and operation of the AS/SVE system at OU1 of the Site. The operation of this system is clearly having an effect on vapor intrusion at the Site and has reduced the levels of PCE below that which would trigger EPA to take a response action.

Figure 1



	Dec-13	1-Mar	Feb-16	Oct-16	Feb-17
128 Subslab	8000	6990	7700	300	18
138 SS-01	4200	1190	2800	300	2.1
138 SS-02	16800	5020	16000	297	6.5

Figure 2


Ravenswood PCE Site Indoor Air
PCE ug/M3
300
250
200
150
100
50
0
Dec-13
Mar-14
Feb-16
Febuary 2017
120 Washington St 159 0 0
138 Washington Main 1.9 0.59 0
138 Washington St Main 2 3.6 0.58 1.4
128 Washington St 263 3.6 2.3
128 Washington (2) 184 2.5 0
138 Washington Basement 10.7 13.8 2.3 4.7
138 Washington Basement 10 11.9 1.9 3.6
Axis Title
120 Washington St
138 Washington Main
138 Washington St Main 2
128 Washington St
128 Washington (2)
138 Washington Basement
138 Washington Basement

V. Description of Significant Differences and the Basis for Such Differences

The 2011 ROD did not address vapor intrusion at the Site. At the time the ROD was signed, the extent and breadth of vapor intrusion was not completely understood, and EPA had intended to address vapor intrusion as a separate Operable Unit at the Site. Since issuing the ROD in May 2011, EPA has completed a Pre-Remedial Design Investigation, a Remedial Design, the installation of the Remedial Action at the Site, as well as numerous rounds of vapor-intrusion sampling. These response activities have shown that the groundwater cleanup has significantly reduced the levels of VOCs in the sub-slab and indoor air of buildings at the Site. As a result, EPA has determined that a separate cleanup decision for vapor intrusion is no longer necessary, and that vapor intrusion at the Site can be addressed by the continued operation of the AS/SVE system and by a modification to the remedial action to include long-term sampling and monitoring.

By issuance of this ESD, EPA is modifying the 2011 ROD by adding the following requirement concerning vapor intrusion:

> Monitoring for Vapor Intrusion: Sampling of sub-slab and indoor air in several commercial buildings and residences at the Site will be performed twice per year to ensure the effectiveness of the current remedy. EPA, in consultation with the West Virginia Department of Environmental Protection ("WVDEP"), will modify the frequency and number of samples in the future as sampling results warrant. Sampling modifications will be made utilizing the June 2015 *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air*. A copy of this guide can be found in the Administrative Record.

This modification to the ROD will continue to provide protection to public health and the environment by addressing an additional exposure pathway of PCE releases at the Site. CERCLA and the NCP require that a modification to a remedial action, such as this ESD, continues to be protective. In this case, twice annual sampling will permit EPA to determine if the groundwater cleanup continues to reduce levels of vapor intrusion as depicted in Figures 1 and 2. The addition of semi-annual sampling for vapor intrusion will be protective, as required by CERCLA and the NCP, because it will provide EPA with the necessary information to take additional response actions to address vapor intrusion should they be warranted.

VI. Support Agency Comments

The WVDEP reviewed this ESD and is supportive of the modification to the ROD, with a couple of recommendations. First, WVDEP has recommended that an additional late spring/early summer sub-slab seasonal sampling event occur in 2018. This will provide more data with regard to potential seasonal differences. Second, should analytical data results trend upwards from samples collected during future sub-slab and indoor air sampling events, WVDEP has recommended that an additional late spring/early- to mid-summer indoor air sampling event be conducted. EPA has no objection to these recommendations and will instruct its contractors to conduct the sampling events accordingly.

VII. Statutory Determinations

EPA has determined that the modified remedy as described in this ESD complies with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621. EPA believes that the remedy, as revised by this ESD, will protect human health and the environment, is cost effective, and meets the Federal and State requirements that are applicable or relevant and appropriate to the Remedial Action as described in the ROD.

VIII. Community Involvement

In accordance with Section 117(d) of CERCLA, 42 U.S.C. § 9617(d), and Section 300.435(c)(2)(i)(B) of the NCP, 40 C.F.R. § 300.435(c)(2)(i)(B), EPA will publish a notice of availability of this ESD and will appear at an upcoming Ravenswood City Council meeting to discuss this ESD.

The Administrative Record includes the documents supporting this ESD. The Administrative Record is available for public review at the Jackson County Library in Ravenswood, at the U.S. EPA Region III Records Center in Philadelphia, Pennsylvania, and online at https://semspub.epa.gov/src/collection/03/AR61829.on the internet at: https://semspub.epa.gov/src/collections/03/AR/WVSFN0305428

XIX. Signature

This Explanation of Significant Differences, which modifies the selected remedy for the Ravenswood PCE Superfund Site to reflect the addition of vapor-intrusion sampling to the groundwater remedy selected in the May 23, 2011 ROD, is hereby approved.

Approved by:

Karen Melvin, Director
Hazardous Site Cleanup Division

SEP 27 2017
Date

RAVENSWOOD PCE
OU1 ADMINISTRATIVE RECORD FILE *
INDEX OF DOCUMENTS

III. REMEDIAL RESPONSE PLANNING

1. Report: Interim Investigation Report, Volume I of II, Ravenswood PCE Site, Ravenswood, West Virginia, prepared GAI Consultants, Inc., 7/13/01. P. 300001-3000569. A June 7, 2002, cover letter to Mr. Eric Newman, U.S. EPA, from Mr. Peter Costello, West Virginia Department of Environmental Protection (WVDEP), is attached.

2. Report: Interim Investigation Report, Volume II of II, Ravenswood PCE Site, Ravenswood, West Virginia, prepared by GAI Consultants, Inc., 7/13/01. P. 300570-300790.

3. Report: 2001 Investigation Summary, Addendum No. 1, Ravenswood PCE Site, Ravenswood, West Virginia, prepared by GAI Consultants, Inc., 5/02. P. 300791-301065.

4. Report: Draft Hydrogeological Analysis Report, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 3/31/06. P. 301066-301287. A March 31, 2006, cover letter to Mr. Anthony Iacobone, U.S. EPA, from Ms. Lynne France, CDM, is attached. **

5. Report: Draft Site Management Plan Addendum, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 10/14/08. P. 301288-301502. Related documents are attached. **

6. Report: Working Draft Treatability Study Plan, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 10/27/08. **

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* Administrative Record File available 12/8/10, updated 1/6/11 and 5/31/11. Raw sampling data for the Ravenswood PCE site not included in this Administrative Record File can be found in U.S. EPA's Region III offices in Philadelphia, Pennsylvania.

** Confidential Business Information has been redacted from this document. The redaction is evident from the face of the document.

P. 301503-301571.

7. Report: Final Site Management Plan Addendum, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 12/17/08. P. 301572-301581. A December 17, 2008, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, and a December 22, 2008, letter to Ms. Lynne France, CDM, from Ms. Laura Johnson, U.S. EPA, regarding approval of the Final Site Management Plan Addendum, are attached. **

8. Report: Final Treatability Study System Installation and Baseline Conditions Report, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 1/4/10. P. 301582-301812. A January 4, 2010, letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, regarding approval of the Draft Treatability Study System Installation and Baseline Conditions Report, is attached. **

9. Report: Final Site Management Plan Addendum 2, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 1/19/10. P. 301813-301884. A January 19, 2010, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, is attached. **

10. Technical Memorandum to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, re: Interim Evaluation of Treatability Study Effectiveness, 3/29/10. P. 301885-301898. A March 29, 2010, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, is attached. **

11. Report: Final Human Health Risk Assessment, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 3/31/10. P. 301899-302253. **

12. Report: Final Screening Level Ecological Risk Assessment (SLERA), Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 6/28/10. P. 302254-302327. A June 28, 2010, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, is attached. **

13. Report: Final Feasibility Study, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West **

Virginia, prepared by CDM, 10/18/10. P. 302328-302481. An October 18, 2010, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, is attached.

14. Report: Final Remedial Investigation Report, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by CDM, 10/20/10. P. 302482-302806. An October 20, 2010, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, is attached. **

15. Technical Memorandum to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, re: Interim Evaluation of Treatability Study Effectiveness, 10/28/10. P. 302807-302828. An October 28, 2010, cover letter to Ms. Laura Johnson, U.S. EPA, from Ms. Lynne France, CDM, is attached. **

16. Proposed Plan, Ravenswood PCE Superfund Site, Operable Unit 1, 1/11. P. 302829-302859.

17. Letter to Mr. Ronald Borsellino, U.S. EPA, from Mr. Ken Ellison, WVDEP, re: State of West Virginia concurrence with the April 2011 OU-1 Record of Decision, 4/12/11. P. 302860-302860.

18. Record of Decision, Operable Unit 1 (OU1), Ravenswood PCE Superfund Site, Ravenswood, West Virginia, 5/23/11. P. 302861-302934.

IV. REMOVAL RESPONSE PROJECTS

1. Report: Trip Report, June 2006 Sampling Event, Ravenswood PCE Site - Removal Project, Ravenswood, West Virginia, prepared by TechLaw, Inc., 9/7/06. P. 400001-400046.

V. COMMUNITY INVOLVEMENT INVOLVEMENT/CONGRESSIONAL CORRESPONDENCE/IMAGERY

1. U.S. EPA Fact Sheet: Ravenswood PCE Superfund Site, City of Ravenswood, Jackson County, West Virginia, entitled, "Proposed Plan Announced for Ravenswood PCE Superfund Site," 1/11. P. 500001-500004.

2. U.S. EPA Public Notice, Ravenswood PCE Superfund Site, re: EPA Opens Public Comment Period and Holds Public Meeting for the Proposed Cleanup Plan, 1/10/11. P. 500005-500005.

RAVENSWOOD PCE
REMOVAL ADMINISTRATIVE RECORD FILE *
INDEX OF DOCUMENTS

I. FACTUAL INFORMATION/DATA

1. Technical Memorandum to Mr. Anthony Iacobone, U.S. EPA, from Mr. Chris Wolfe, HydroGeologic, Inc. (HGL), re: Pre-Remedial Design Investigation Report, Ravenswood PCE Site, Ravenswood, West Virginia, 5/10/13. P. 100001-100077. Related documents are attached.

2. Report: Final Basis of Design Report, Ravenswood PCE Superfund Site, Ravenswood, Jackson County, West Virginia, prepared by HGL, 6/13. P. 100078-100836. A July 16, 2013, transmittal letter to Mr. Anthony Iacobone, U.S. EPA, from Mr. Chris Wolfe, HydroGeologic, Inc., and HGL Responses to Comments, Final Basis of Design Report, are attached.

3. Draft Technical Memorandum to Mr. Anthony Iacobone, U.S. EPA, from Ms. Misty Kauffman, HGL, re: Vapor Intrusion Sampling, Ravenswood PCE Superfund Site, Ravenswood, West Virginia, 6/16/14. P. 100837-100889. Related documents are attached. **

4. U.S. EPA Pollution Report # 1, Ravenswood PCE - RESTART, 4/14/15. P. 100890-100893.

5. U.S. EPA Pollution Report # 2, Ravenswood PCE - RESTART, 4/15/15. P. 100894-100897.

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* Administrative Record File available 5/19/15.

** Draft document has been approved for release. This document has been redacted to protect the privacy of individuals and due to confidential business information. Redactions are evident on the face of the document.

6. U.S. EPA Pollution Report # 3, Ravenswood PCE - RESTART, 4/16/15. P. 100898-100901.

7. U.S. EPA Pollution Report # 4, Ravenswood PCE - RESTART, 4/20/15. P. 100902-100905.

8. U.S. EPA Pollution Report # 5, Ravenswood PCE - RESTART, 4/23/15. P. 100906-100910.

9. U.S. EPA Pollution Report # 6, Ravenswood PCE - RESTART, 4/25/15. P. 100911-100915.

II. DECISION DOCUMENTS

1. Action Memorandum to Mr. Dave Wright, U.S. EPA, from Mr. Michael Towle, U. S. EPA, re: Request for Increased Funding, Modification of the Scope, and Exemption from the 12-Month and $2 Million Statutory Limit for a Removal Action, 3/19/15. P. 200001-200019. A memorandum to Mr. Mathy Stanislaus, U.S. EPA, from Mr. David Wright, U.S. EPA, regarding approval of a request for increased funding, a modification of the scope and exemption from the 12-month and $2 million statutory limits for a removal action dated March 19, 2015, and a list of Administrative Record Documents are attached.

2. Action Memorandum to Mr. Dave Wright, U.S. EPA, from Mr. Michael Towle, U. S. EPA, re: Request for Increased Funding for a Removal Action, 4/30/15. P. 200020-200029. A memorandum to Mr. Mathy Stanislaus, U.S. EPA, from Mr. David Wright, U.S. EPA, regarding approval of a request for increased funding for a removal action, is attached.