

**THIRD EXPLANATION OF SIGNIFICANT DIFFERENCES
CROYDON TCE SUPERFUND SITE
Operable Unit #2**

I. INTRODUCTION AND STATEMENT OF PURPOSE

Site Name: Croydon TCE Superfund Site

Site Location: Bristol Township, Bucks County, Pennsylvania

Lead Agency: U.S. Environmental Protection Agency,
Region III (EPA or the Agency)

Support Agency: Pennsylvania Department of Environmental Protection ("PADEP")

The EPA has initiated remedial action activities at the Croydon TCE Site ("the Site") under the authority of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. § 9601 et seq., commonly referred to as Superfund. The remedial actions at the Site are being performed in accordance with two Records of Decision ("RODs"). The ROD for Operable Unit 1 ("OU1"), issued on December 28, 1988, provided for an extension of the public waterline to residents affected by groundwater contamination from the Site. The ROD for Operable Unit 2 ("OU2"), issued on June 29, 1990, addressed the containment, treatment, and discharge of the contaminated groundwater plume.

This Explanation of Significant Differences ("ESD") is issued in accordance with Section 117(c) of CERCLA, 42 U.S.C. § 9617(c), and Section 300.435(c)(2)(i) of the National Contingency Plan ("NCP"), 40 C.F.R. § 300.435(c)(2)(i), to document changes to the OU2 ROD and to demonstrate that the revised remedy complies with the statutory requirements of CERCLA § 121, 42 U.S.C. § 9621. The NCP requires the publication of an ESD when the differences in a remedial action significantly change, but do not fundamentally alter the remedy selected in a ROD with respect to scope, performance, or cost.

This ESD modifies the remedy selected in the OU2 ROD by officially discontinuing pumping and treatment of groundwater and allowing for the dismantling of the pump and treat system, which no longer effectively removes groundwater contaminants. A pilot study to evaluate alternative groundwater remedies will be conducted. A subsequent decision document will be issued by EPA for the selection of a new groundwater remedy. The basis for these changes are set forth below in Section III (Description of Significant Differences and the Basis for those Differences).

II. SUMMARY OF THE SITE HISTORY, CONDITIONS AND SELECTED REMEDY

As set forth in detail in the RODs, the Site is located in a 3.5 square mile area within the southernmost portion of Bristol Township, Bucks County, Pennsylvania. The area includes

residential, commercial, and industrial properties and is bordered by Interstate 95 to the north, the Delaware River to the south, Route 413 to the east and Neshaminy Creek to the west. Elevated levels of volatile organic contaminants ("VOCs"), primarily trichloroethene ("TCE"), have been detected in the groundwater and in surface water. However, no source has been identified to date.

The Site includes the groundwater impacted by Site-related contaminants, as well as the appurtenant facilities such as the groundwater treatment system, and extraction and monitoring wells that are necessary to facilitate the remedy.

The Site was discovered by EPA during an investigation of the adjacent Rohm and Haas facility in the early 1980's. The Rohm and Haas facility is located on the southern boundary of the 3.5 square mile study area. Monitoring wells and residential wells located north of a Rohm and Haas landfill were found to be contaminated with TCE and other VOCs. Based on the results of early investigations, the contamination was not considered part of the Rohm and Haas facility and therefore, EPA proposed the Site to the National Priorities List ("NPL") on September 18, 1985. The Site was formally added to the NPL on June 10, 1986.

In 1987, EPA and its contractor began a Remedial Investigation and Feasibility Study ("RI/FS") to determine the nature and extent of contamination associated with the Site. During the Phase I RI, elevated levels of VOCs were detected in groundwater. In addition to TCE contamination, tetrachloroethene, vinyl chloride, 1,1,1-trichloroethane ("1,1,1-TCA"), and 1,1-dichloroethene ("1,1-DCE") were also detected in groundwater. The contaminated groundwater plume was identified in the southeastern portion of the 3.5 square-mile study area. TCE was identified as the primary contaminant of concern because its concentration was found at a magnitude greater than any other contaminant. TCE was detected at levels as high as 420 micrograms per liter ("ug/L") in Site groundwater monitoring wells. TCE and other VOCs were also detected in certain residential wells above EPA's drinking water standards, promulgated pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. § 300g-1, and codified at 40 C.F.R. Part 141.

VOC contamination was also detected in surface water in nearby tributaries and streams. The East and West Branches of Hog Run Creek originate in the area between River Road and State Road and join Hog Run Creek just north of River Road. Hog Run Creek then flows southward under River Road, between two Rohm and Haas landfills, and into the Delaware River. The Delaware River is the regional discharge point for groundwater and surface water. Only TCE at 6 ug/L and 1,1,1-TCA at 2.3 ug/L were detected in surface water samples collected from the East Branch of Hog Run Creek and TCE at 0.4 ug/L in samples from Hog Run Creek. The East Branch is located in the area where the highest concentrations of TCE and other related VOCs were detected in groundwater. The source of VOCs in the surface water was believed to be due to discharge of contaminated groundwater from the Croyden TCE Site and the former Rohm and Haas facility.

The Phase I RI was completed in August 1988. Based on the Phase I RI, EPA determined that exposure to the contaminated groundwater posed an unacceptable risk to users of wells located within the TCE plume. The immediate threat to human health was addressed by the provision of an alternate water supply to households and one business where contaminants in groundwater exceeded applicable Maximum Contaminant Levels ("MCLs"), codified at 40 C.F.R. Part 141. During Phase II of the RI, four of the eleven potential source areas were evaluated further. However, no definitive source was identified. The Phase II RI was completed in January 1990.

Remedy Selection and Implementation

EPA has issued two RODs as part of the overall cleanup strategy for the Site. On December 28, 1988, considering the results of the Phase I investigation discussed above, EPA issued the OU1 ROD, which provided for an extension of an existing public waterline to those affected by the groundwater contamination.

On June 29, 1990, following the completion of the Phase II investigation, EPA issued a second ROD for the Site. In the OU2 ROD, EPA selected a groundwater extraction and treatment remedy to address the contaminated groundwater.

EPA issued two ESDs to modify the OU2 remedy. The first ESD was issued on December 31, 1996 ("1996 ESD"), and the second on September 21, 2011 ("2011 ESD"). The major components of the two RODs and the ESDs are described below:

Operable Unit 1 ROD (Waterline)

1. Connection of homes located within the groundwater contamination plume to the existing public water supply. The OU1 ROD also provided that EPA transfer control of the new water line and service to the Borough of Bristol Water and Sewage Department ("BBWSD") following construction.
2. Sampling of groundwater outside the TCE plume area to monitor the possible migration of contaminants.

Operable Unit 2 ROD (Groundwater Extraction and Treatment)

1. Installation and operation of extraction wells to contain the further migration of contaminated groundwater and restore groundwater quality to background levels.
2. Treatment of the extracted groundwater using an air stripper; off-gas treatment using carbon adsorption, and onsite discharge to the East Branch of Hog Run Creek.

3. Annual groundwater monitoring of selected monitoring and residential wells to confirm the extraction system's ability to capture contamination and prevent further migration.
4. Institutional controls, including groundwater use restrictions in the affected area, to prevent the potable use of contaminated groundwater during remediation. The OU2 ROD anticipated these controls would be implemented by state or local authorities.

1996 ESD

On December 31, 1996, EPA issued the 1996 ESD to modify the OU2 remedy by designating part of the original plume of groundwater contamination as a separate plume coming from off-Site. Data available at the time of the OU2 ROD suggested the Site included two co-mingled plumes. Additional data collected later during the design phase led to the conclusion that there are two separate plumes. The two plumes, identified as "Plume A" and "Plume B" result from different sources, contain different mixes of contaminants and flow in opposite directions. EPA determined that the eastern plume, or "Plume B," should not be addressed as part of the remedy. Instead, Plume B is being addressed as part of an ongoing Resource Conservation and Recovery Act ("RCRA") Corrective Action at the adjacent Rohm and Haas facility.

2006 – Operation Turnover to PADEP

In 2006, in accordance with the State Superfund Contract for the Site, PADEP took over the operation and maintenance ("O&M") of the pump and treat system. At that point, the system had been running for ten years, and contaminant levels had dropped to approximately 10 ug/L at the system influent.

2011 ESD

On September 21, 2011, EPA issued the 2011 ESD which modified OU2 by (1) changing the cleanup standards for TCE and TCA from background standards to the applicable MCLs, which are 5 ug/l and 7 ug/l, respectively, and (2) changing the monitoring well network by monitoring the contaminant plume using Site monitoring wells only, rather than using Site *and* residential monitoring wells.

2011 Five-Year Review

The third five-year review for the Site, which EPA issued in December 2011, included the following issue and recommendation:

Issue:

- TCE levels are below or just above the applicable MCLs across the Site. All other Site-related contaminants are below their respective MCLs. Because the pump and treat system has shown diminishing returns over the last several years, PADEP decided to turn it off in March 2009 to conduct a contaminant rebound test. It has remained off since that time.

Recommendations:

- EPA and PADEP should evaluate the groundwater contaminant rebound at the Site since the pump and treat system was turned off in March 2009, and determine whether to turn it back on, or to modify the OU2 remedy.

III. DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES

This ESD modifies the remedy selected in the OU2 ROD by formally discontinuing pumping and treatment of groundwater even though MCLs have not been reached, and allowing for the dismantling of the pump and treat system. PADEP and EPA agree the data show that the continued operation of the pump and treat remedy is unnecessary due to its limited effectiveness in reaching the required performance standards. Additionally, the building and equipment is the subject of recurring vandalism. PADEP and local authorities have safety concerns over this issue. The necessary work to dismantle the equipment and remove the building will be performed by the PADEP, which took over the operation and maintenance of the pump and treat system in 2006. This ESD will serve as a precursor to a forthcoming EPA decision document that will further amend the selected remedy and identify the final phase of the groundwater remedy at the Site, following completion of pilot testing that PADEP has agreed to perform.

Formalizing discontinuance of the pumping and treatment of groundwater and dismantling the system at this time is practical for several reasons. While the system initially removed a significant amount of contamination from groundwater and surface water, it became much less effective as contaminant concentrations decreased. From March of 1995, when the system was turned on, to October of 1998, influent levels of TCE went from more than 74 ug/L to less than 20 ug/L. Over the next 10 years, influent levels of TCE continued decreasing at a slower pace to about 10 ug/L in July 2007. However, from September 2007 to March 2009, influent levels of TCE remained at a near steady state, fluctuating between 6.7 and 8.3 ug/L over 19 monthly sampling events. The MCL for TCE is 5 ug/L.

The recent ineffectiveness of the pump and treat system is well-documented in the administrative record for the Site. Due to the limited performance, in March 2009, PADEP shut the system off to perform a contaminant rebound test, with EPA concurrence. A rebound test is conducted to observe whether contaminants will rebound back to higher concentrations without the system running, in order to evaluate contaminant removal by the system. The next few sampling rounds did not show any contaminant rebound, thus indicating that the system was no longer performing efficiently. Because contaminant levels have not rebounded since then, and the plume is not migrating, EPA and PADEP have agreed to keep the system off while continuing to monitor the plume.

In addition, the building which houses the pump and treat system has been heavily vandalized on a regular basis since before 2009. Vandals have repeatedly cut through the surrounding fence, smashed the lock on the door, broken into the building, stolen equipment, and even started a fire inside the building, among other inappropriate activities. All incidents have been documented by PADEP, in semi-annual monitoring reports prepared by PADEP's contractor, which are available as part of the administrative record for this document.

As a result of the decreased performance of the pump and treat system, and the recurring vandalism of the treatment system building, PADEP has requested that EPA allow them to indefinitely discontinue pumping and treating the groundwater and to dismantle the system. PADEP has stated that the Commonwealth is spending a great deal of money and time to repeatedly repair and secure the treatment system building, which has become a danger to trespassers and a source of neighborhood complaints, for a system that no longer adequately removes contaminants.

EPA and PADEP are currently exploring alternative groundwater remedies for the Site, and PADEP has agreed to conduct a pilot test to evaluate injections of bio-stimulants in certain areas where TCE levels are still slightly above the MCL (between 5 and 20 ug/L). EPA anticipates issuing a decision document for the selection of a new groundwater remedy within the next several years. Based on groundwater data over the last 20 years of operation, the existing pump and treat system appears to have reached asymptotic levels, and will be unable to remove the remaining contaminants needed to achieve groundwater performance standards. Because of the circumstances described above, EPA agrees that it is appropriate to formally discontinue pumping and treatment, and to dismantle the system at this time. Monitoring data demonstrate that the groundwater plume is not migrating and does not present a risk to nearby residents, who have been connected to public water.

Scope, Performance and Cost

The changes set forth in this document will significantly change the scope of the OU2 remedy because the groundwater extraction and treatment system has reached a steady state and EPA has concluded that the existing groundwater remedy will be removed. These changes are considered significant, but not fundamental alterations to the scope of the OU2 remedy because

the facts and circumstances of this case warrant discontinuing the system, but a replacement groundwater remedy has not yet been selected. PADEP and EPA are currently evaluating alternatives, which EPA intends to document and make available to the public in the administrative record for this Site. EPA anticipates issuing a decision document for selection of a new groundwater remedy within the next several years. Performance of the remedy will not be affected by these changes, since pumping ceased in March 2009. EPA and PADEP will continue to monitor groundwater for potential plume migration, and MCLs currently remain as the cleanup goals for groundwater, based on the 2011 ESD. Cost will be reduced for the time being because maintaining the pump and treat system and repairing damage from vandalism on a regular basis will no longer be an issue.

IV. PUBLIC AVAILABILITY

This ESD will become part of the Administrative Record File for the Site. The Administrative Record also includes the OU1 and OU2 RODs, the 1996 ESD, the 2011 ESD and all documents that formed the basis for EPA's selection of the cleanup remedy for the Site. The Administrative Record is available for public review at the following locations:


- On-line at www.epa.gov/arweb
- Margaret R. Grundy Memorial Library
680 Radcliffe Street, Bristol, PA 19007
Contact: Dana Barber, Associate Library Director
(215) 788-7891, ext. 14
- U.S Environmental Protection Agency, Region III Office
1650 Arch Street, Philadelphia, PA 19103
Contact: Paul Van Reed, Superfund Records Manager, for an appointment
(215) 814-3157

V. SUPPORT AGENCY REVIEW

In accordance with 40 C.F.R. § 300.435(c)(2), EPA has notified PADEP of the modifications to the Site remedy described in this ESD. By letter dated September 2, 2015, PADEP informed EPA that it concurred with this ESD.

VI. AFFIRMATION OF STATUTORY DETERMINATION

EPA believes that the selected remedial actions presented in the June 29, 1990 OU2 ROD, the 1996 ESD, and the 2011 ESD, as modified by this third ESD, are protective of human health and the environment, comply with Federal and State requirements that are applicable or relevant and appropriate to this remedial action because the groundwater performance standards remain unchanged, and are cost-effective.


Cecil Rodrigues, Director
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EPA Region III

9/9/2015
Date