EXPLANATION OF SIGNIFICANT DIFFERENCES
CRATER RESOURCES, INC./KEYSTONE COKE CO./ALAN WOOD STEEL CO. SUPERFUND SITE
UPPER MERION TOWNSHIP, MONTGOMERY COUNTY, PENNSYLVANIA

I. INTRODUCTION

Site Name:	Crater Resources, Inc./Keystone Coke Co./Alan Wood Steel Co. Superfund Site (Site)
Site Location:	Upper Merion Township, Montgomery County, Pennsylvania
Lead Agency:	U.S. Environmental Protection Agency, Region III (EPA)
Support Agency:	Pennsylvania Department of Environmental Protection (PADEP)

II. STATEMENT OF PURPOSE

This Explanation of Significant Differences (ESD) is being issued in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation and Liability Act, as amended (CERCLA), 42 U.S.C. § 9617(c), and 40 C.F.R. § 300.435(c)(2)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The NCP requires the publication of an ESD when modifications to the remedial action selected in the Record of Decision (ROD) are necessary, and such modifications significantly change, but do not fundamentally alter, the remedial action with respect to scope, performance, or cost.

This ESD has been prepared to provide the public with an explanation of modifications to the selected remedy for Operable Unit (OU) 1 (Quarry 1 and surrounding impacted soils) and OU2 (Quarry 2 and surrounding impacted soils) at the Site. The ROD for the Site, signed by EPA on September 27, 2000, includes construction of a multi-media cap, in accordance with 25 PA Code Sections 288.234 and 288.236-237, at OU1 and OU2 to prevent unacceptable leaching of contaminants from the soils into groundwater and to mitigate the direct contact threat of impacted soils to human health and environmental receptors. The performance standards specified in the ROD were based on a commercial/industrial land use. This ESD documents a change in performance standards to allow for residential use of OU1 and OU2. As a result, the areas of the multi-media cap will be expanded and a vapor intrusion assessment will be conducted prior to occupancy of any building within 100 feet of the groundwater plume under OU1 and OU2, as well as the surrounding impacted soils. If it is determined that an unacceptable risk is present, vapor mitigation will be required prior to residential use.

This ESD is now part of the Administrative Record for the Site as detailed in Section VIII of this ESD.

The information that supports this ESD and confirms its compliance with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621 is provided herein. This ESD changes, but does not fundamentally alter, the remedy selected in the ROD with respect to scope,

performance, or cost. Thus, a ROD Amendment is not required to document these changes.

Copies of the Administrative Record file are located in the information repository at the Upper Merion Township Building in King of Prussia, Pennsylvania, and online at https://semspub.epa.gov/src/search.

III. SUMMARY OF THE SITE HISTORY AND SITE CONDITIONS

The Site is located in Upper Merion Township, Montgomery County, Pennsylvania, approximately 10 miles northwest of Philadelphia. The Site covers approximately 50 acres, much of which is now developed as commercial office complexes in various parcels. The remaining undeveloped portions of the Site, excepting Quarry 3, are slated for similar development in the near future. The Site is generally bounded by Crooked Lane to the west, Renaissance Boulevard to the north and east, and the Gulph Mills Golf Club to the south. The area surrounding the Site is made up of industrial, commercial, residential, and undeveloped land parcels.

The Site consists primarily of four quarries plus other features including a waste pipeline and other impacted areas. Quarries 1, 2, and 3 were disposal sites for waste ammonia liquor (WAL) generated at the Keystone Coke/Alan Wood Steel facility in Conshohocken, Pennsylvania. There are no records indicating that WAL or other waste materials were disposed in Quarry 4. For the purposed of addressing the various impacted areas, the Site was divided into ten OUs. Table 1 lists all of the OUs, the Remedial Action Objective(s) (RAO) for each OU, and the current status.

OU1 and OU2 have completed Remedial Designs (RDs) and a temporary cover consisting of geotextile and stone has been constructed over each quarry. Remedial Actions (RAs) required by the ROD have been completed at OU3, OU5, and OU7 through OU10. The OU6 groundwater remedy is monitored natural attenuation (MNA) and a monitoring program has been implemented. EPA issued an ESD on December 16, 2016 to eliminate the cap and drainage layer performance standards for Quarry 4 only, in accordance with 25 PA Code Section 288.234(b).

According to a previous investigation conducted by EPA, no private wells are used as a potable supply of water in the vicinity of the Site. Upper Merion Township requires all of its potable water users to connect to public water if there is a public main available, although non-potable wells are permitted. Surface water drainage is generally eastward towards the Schuylkill River, approximately one mile to the east.

A detailed history of RA activities completed to date at OU1 and OU2 is provided in Section IV.

Table 1

Operable Unit	Remedial Action Objectives	Current Status
OU1 – Quarry 1	Prevent migration of COCs to groundwater and surface water.	• Remedial Design complete. • Remedial Action underway. • Soil cut/fill complete and temporary cover installed. • All contaminated materials placed under temporary cap and fencing erected to restrict access. • This ESD addresses the change in land use and impacted soils outside quarry footprint.
OU2 – Quarry 2	Prevent migration of COCs to groundwater and surface water.	• Remedial Design complete. • Remedial Action underway. • Soil cut/fill complete and temporary cover installed. • All contaminated materials placed under temporary cap and fencing erected to restrict access. • This ESD addresses the change in land use and impacted soils outside quarry footprint.
OU3 – Quarry 3	• Eliminate exposure to soil/sediment which presents an unacceptable risk to human health. • Limit exposure of ecological receptors to affected surface water in the Quarry 3 pond water.	Remedial Action complete.
OU4 – Quarry 4	Prevent migration of COCs to groundwater and surface water.	• Demonstration project completed to show that leaching from the quarry to groundwater is not occurring. • ESD, signed in 12/2016, documents change in capping requirements completed.
OU5 – WAL Pipeline	Eliminate exposure to soil/sediment which presents an unacceptable risk to human health.	Remedial Action Complete.
OU6 – Groundwater MNA	Restore groundwater to its beneficial use (as drinking water)	Groundwater monitoring ongoing.
OU7 – Cinder/Slag Fill Area	Eliminate exposure to soil/sediment which presents an unacceptable risk to human health.	Remedial Action Complete.
OU8 – Area 6	• Eliminate exposure to soil which presents an unacceptable risk to human health.	Remedial Action Complete.

Operable Unit	Remedial Action Objectives	Current Status
	• Prevent migration of COCs to groundwater and surface water.	
OU9 – Southeast Property Area	• Eliminate exposure to soil which presents an unacceptable risk to human health. • Prevent migration of COCs to groundwater and surface water.	Remedial Action Complete.
OU10 – Lot 7	• Eliminate exposure to soil which presents an unacceptable risk to human health. • Prevent contact of soil/sediment constituents with other media such as groundwater and surface water which may transport the contamination.	Remedial Action Complete.

IV. DESCRIPTION OF SELECTED REMEDY AND REMEDY IMPLEMENTATION

Selected Remedy

EPA selected the remedy for the Site in a September 27, 2000 ROD (Selected Remedy). The contaminants of concern (COCs) identified for each medium, and the range of concentrations, are presented in Table 2 of the ROD. For groundwater, COCs include several metals and cyanide, PAHs and volatile organic compounds (VOCs). Metals, cyanide, and PAHs were detected in surface and subsurface soils and sediments throughout the Site, including the quarries and soils associated with the WAL pipeline.

RAOs are medium-specific environmental goals to address the COCs and potential exposure routes and receptors, which have been identified by either the Human Health Risk Assessment or the Ecological Risk Assessment. The following Site-wide RAOs have been developed to address the following site-specific concerns:

Soil/Sediment -

- Eliminate exposure to soil/sediment which presents an unacceptable risk to human health or the environment.
- Prevent contact of soil/sediment constituents with other media such as groundwater and surface water which may transport the contamination so that the transport does not create an unacceptable risk to human health or the environment.

Surface Water -

- Limit exposure of ecological receptors to affected surface water in the Quarry 3 pond water.

Groundwater -

- Prevent future potential exposure to ingestion of Site-related groundwater so that the exposure risk level is between 10^{-4} and 10^{-6} excess cancer risk and the hazard index (HI) is less than 1.
- Restoration of the aquifer to a beneficial use.

Based on an evaluation of providing the best attainment of the RAOs, EPA selected the remedy for the Site in the ROD, as summarized in the Table 2, below:

Table 2

Components of Selected Remedy
1. Removal of all contaminated soils and sediments in Quarry 3
2. Construction of a multi-layer cap to prevent infiltration of surface water into the contaminated soils of Quarries 1, 2, and 4 and other contaminated soil areas
3. Monitored natural attenuation of the groundwater
4. Further investigation of the former WAL pipeline that was located between the Alan Wood Steel facility and Quarries 1, 2, and 3 located on the Site
5. Institutional controls

Adapted from Record of Decision signed September 27, 2000 (page 53).

The ROD specifies that a multi-media cap consisting of a series of low-permeability clays, geotextile liners, sand drainage layers, and soil or other appropriate covers to prevent unacceptable leaching of contaminants from the soils and sediment into the groundwater shall be constructed at OU1 and OU2. Pursuant to the ROD, the cap is to be constructed in accordance with the Commonwealth's Residual Waste Management Regulations, for final cover of Class 1 residual waste landfills, set forth at 25 Pa. Code Sections 288.234 and 288.236-237.The remedy selected for the Site in the ROD allows for commercial/industrial development of OU1 and OU2, once the design and construction activities are complete and the institutional controls are implemented.

Groundwater use is prohibited as part of the institutional controls placed on the Site by the property owners. Consistent with EPA's Monitored Natural Attenuation Guidance (Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites, April 21, 1999), groundwater is currently being monitored for a 15-year period. If, during the 15-year time period, it is evident that natural attenuation will not meet the RAO, EPA will require that the contingent groundwater remedy be implemented.

Remedy Implementation at OU1 and OU2

OU1 includes Quarry 1 and the area of concern (AOC) on the western side of Quarry 1 that was impacted by WAL, identified as the "Outside Quarry 1 AOC". OU2 includes Quarry 2 and the AOCs north and northwest of Quarry 2, referred to as the "PADEP AOC" and the "West Side of Quarry 2 AOC", respectively. A section of the WAL Pipeline was also located adjacent to Quarry 2. The Outside Quarry 1 AOC, the PADEP AOC, the West Side of Quarry 2 AOC, and the portion of the WAL Pipeline within OU2 are hereinafter collectively referred to as the "AOCs."

O'Neill Properties LLP (O'Neill) is in the process of developing the parcels adjacent to and including OU1, referred to as the 2901 Renaissance Boulevard Parcel, and those adjacent to and including OU2, referred to as the 2501 Renaissance Boulevard Parcel. Figure 1 presents the locations of the O'Neill parcels and the AOCs.

Development of the 2901 Renaissance Boulevard Parcel is planned to be constructed adjacent to the northwestern corner of Quarry 1, in the vicinity of the Outside Quarry 1 AOC. The current development plan includes multi-family residential units for this parcel. In addition, O'Neill plans to construct infrastructure, including parking areas and walkways, on Quarry 1 after RA completion.

O'Neill has completed development of an office building on the 2701 Renaissance Boulevard office building located on a parcel between OU1 and OU2.

Current Status

On February 24, 2016, O'Neill submitted to EPA a request to change land use at OU1 and OU2 from commercial/industrial to residential. The request is documented in "Request for Change in Land Use for 2901 and 2501 Renaissance Boulevard Properties" (February 24, 2016 Request). On March 26, 2016, EPA provided comments on the February 24, 2016 Request and requested additional information including an evaluation of risks on residual contamination remaining outside the quarry areas which had been remediated to the performance standards required by the 2000 ROD. On March 22, 2016, O'Neill submitted a document titled "Environmental Work Plan for Residential Development at the 2901 and 2501 Renaissance Boulevard Properties" (EWP). The EWP includes a work plan for geotechnical studies to support building design.

In April 2016, EPA performed a vapor intrusion screening evaluation and determined that any future buildings constructed over or within 100 feet of impacted groundwater should undergo a quantitative vapor intrusion assessment prior to occupancy and implement vapor intrusion mitigation if unacceptable risks are present as a result of the assessment. The impacted groundwater areas include the portions of OU1 and OU2 on which the 2501 and 2901 Renaissance Boulevard parcels are located.

In May 2017, EPA completed a limited human health risk assessment to evaluate a residential exposure scenario for the AOCs. Data from post-excavation samples collected from the AOCs adjacent to the quarries were evaluated to determine if residual contamination posed potentially unacceptable risks to a future resident. The AOCs were previously remediated to commercial/industrial criteria as the proposed change in land use from commercial to residential was not a consideration at the time EPA signed the ROD. Results of the risk assessment for residential receptors for each AOC are shown on Table 3.

Based on these results, unacceptable risks for a residential receptor, as indicated by a HI greater than 1 or increased lifetime carcinogenic risk (ILCR) greater than 10^{-4}, are estimated for soils remaining at the Outside Quarry 1 AOC, and West Side of Quarry 2 AOC. Estimated risks at the PADEP AOC are at the upper end of the acceptable risk range (HI = 1 and ILCR = 10^{-4}). Results from the risk assessment indicate that residual soils at the WAL Pipeline do not pose a risk to future residential receptors.

The risk assessment also evaluated soil to groundwater risk. Due to the high uncertainty with modeling, EPA considered modeling on a qualitative basis and determined that of the COCs present, naphthalene posed the greatest risk of migration from soils to groundwater. Elevated levels of naphthalene (up to 310,000 micrograms per kilogram) also remain in PADEP AOC soils which could potentially impact local groundwater.

Table 3

Area of Concern (AOC)	Receptor	Medium	HI	ILCR	Primary Risk Contributors
Outside Quarry 1	Child	SS	2	NA	Fe
	Resident	SB	**1.5***	NA	None
	Lifelong	SS	0.2	$7x10^{-6}$	None
	Resident	SB	0.2	$7x10^{-6}$	None
PADEP AOC	Child	SS	**1.5***	NA	None
	Resident	SB	0.9	NA	None
	Lifelong	SS	1	$1x10^{-4}$	None
	Resident	SB	1	$6x10^{-5}$	None
West Side of Quarry 2	Child	SS	**2***	NA	None
	Resident	SB	1	NA	None
	Lifelong	SS	0.2	**$4x10^{-4}$**	cPAHs, Cr VI
	Resident	SB	0.1	**$2x10^{-4}$**	Cr VI
WAL Pipeline	Child	SS	1	NA	None
	Resident	SB	1	NA	None
	Lifelong	SS	0.1	$3x10^{-5}$	None
	Resident	SB	0.1	$2x10^{-5}$	None

HI = Hazard Index
ILCR = Increased Lifetime Carcinogenic Risk
NA = not applicable
As = arsenic
Fe = iron
cPAHs = carcinogenic PAHs
Cr VI = hexavalent chromium
Naph = naphthalene
SB = subsurface soil
SS = surface soil
* HI is less than 1 when grouped by target organ

Based on the results of the risk assessment performed for a residential exposure scenario at OU1 and OU2, and on an evaluation of potential migration of soil contaminants to groundwater, EPA determined that additional response actions are necessary to be protective of human health, as described in detail in Section V of this ESD.

V. DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR SUCH DIFFERENCES

This ESD documents modifications to the Selected Remedy to allow for residential use of OU1 and OU2 and the change in performance standards associated with such use.

The May 2017 risk assessment discussed above demonstrates that unacceptable risks to future residential populations are present and therefore, additional response actions are necessary for OU1 and OU2 to be used for residential purposes.

Therefore, EPA is modifying the remedy for OU1 and OU2 to include the following components to allow for residential development:

1) The multi-media cap required by the 2000 ROD (the Cap) shall be extended over the Area Outside Quarry 1 AOC, West Side of Quarry 2 AOC and the PADEP AOC.
2) The extension of the cap shall include a 15-foot buffer area.
3) Construction details shall follow the cap design specified in the EPA-approved Remedial Design and meet the requirements as specified in the 2000 ROD and set forth in 25 Pa. Code Sections 288.234 and 288.236-237.
4) Institutional controls shall be implemented requiring performance of a vapor intrusion assessment prior to occupancy of any building constructed above or within 100 feet of the groundwater plume under OU1 and OU2.
    a. Mitigation of vapor intrusion shall be required by the institutional controls if the assessment indicates that actual or potential migration of Site-related compounds from contaminated groundwater to indoor air would result in a ILCR of greater than or equal to 10^{-4} and/or a cumulative excess non-carcinogenic HI of greater than 1.

The Selected Remedy in the ROD, as revised by this ESD, will comply with all identified state and federal Applicable or Relevant and Appropriate Requirements (ARARs), and will be protective of human health and the environment.

VI. SUPPORT AGENCY COMMENTS

EPA has consulted with PADEP concerning the changes to the ROD as described in this ESD in accordance with 40 CFR § 300.435 (c)(2). PADEP supports the changes set forth herein and has provided its concurrence on this ESD in a letter dated July 13, 2017.

VII. STATUTORY DETERMINATIONS

EPA has determined that the Selected Remedy in the ROD as modified by this ESD complies with the statutory requirements of Section 121 of CERCLA, 42 U.S.C. § 9621. EPA

believes that the Selected Remedy, as revised by this ESD, will remain protective of human health and the environment and will meet the Federal and State requirements that are applicable or relevant and appropriate to the remedy selected by EPA in the ROD.

VIII. COMMUNITY INVOLVEMENT

The Administrative Record includes the documents that form the basis for EPA's Selected Remedy for the Site, including the documents supporting this ESD. The Administrative Record is available for public review at the locations listed below:

Upper Merion Township Building
175 W. Valley Forge Road
King of Prussia, PA 19406
610-265-2600

Or online at https://semspub.epa.gov/src/search

Questions concerning EPA's action and requests to review the Administrative Record at EPA's office should be directed to:

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McDowell.Joseph@epa.gov

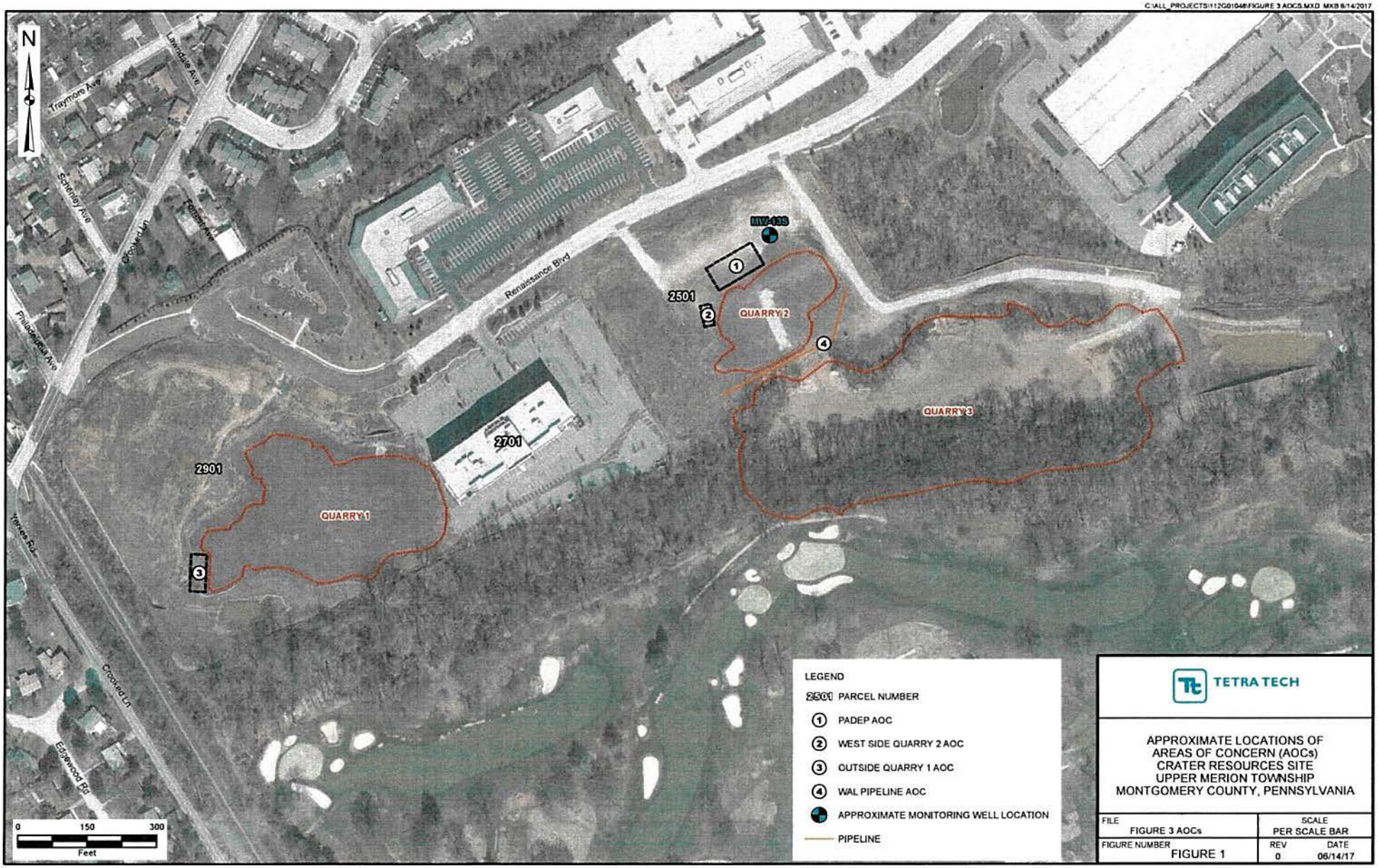
IX. SIGNATURE

This Explanation of Significant Differences modifies the Selected Remedy for the Crater Resources, Inc./Keystone Coke Co./Alan Wood Steel Co. Superfund Site to document a change in performance standards to allow for the residential use of OU1 and OU2 and includes institutional controls to require a vapor intrusion assessment and potential mitigation prior to occupancy of any building above or within 100 feet of the groundwater plume under OU1 and OU2.

Approved by:

Karen Melvin, Director
Hazardous Site Cleanup Division
EPA Region III

JUL 27 2017
Date


C:\ALL_PROJECTS\112G0104\FIGURE 3 AOCS.MXD MKB 6/14/2017
N
Traymore Ave
Lawndale Ave
Schooley Ave
Crooked Ln
Forrest Ave
Philadelphia Ave
Renaissance Blvd
MW-13S
1
2501
2
QUARRY 2
4
QUARRY 3
2701
2901
QUARRY 1
3
Yorkes Rd
Crooked Ln
Edgewood Rd
0
150
300
Feet
LEGEND
2501 PARCEL NUMBER
1 PADEP AOC
2 WEST SIDE QUARRY 2 AOC
3 OUTSIDE QUARRY 1 AOC
4 WAL PIPELINE AOC
APPROXIMATE MONITORING WELL LOCATION
PIPELINE
TETRA TECH
APPROXIMATE LOCATIONS OF
AREAS OF CONCERN (AOCs)
CRATER RESOURCES SITE
UPPER MERION TOWNSHIP
MONTGOMERY COUNTY, PENNSYLVANIA
FILE
FIGURE 3 AOCs
SCALE
PER SCALE BAR
FIGURE NUMBER
FIGURE 1
REV
0
DATE
06/14/17