FINAL DECISION AND RESPONSE TO COMMENTS

KOPPERS INC

FOLLANSBEE, WEST VIRGINIA

March, 2011

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

GLOSSARY

AOC – Area of Concern
BBL – Blasland, Bouck & Lee, Inc.
BTEX – benzene, toluene, ethlybenzene, and xylene
cm/sec – centimeters per second

COC – contaminant of concern
cy – cubic yards
DNAPL – dense non-aqueous phase liquid
DOT – Department of Transportation
FDRTC – Final Decision and Response to Comments
gpm – gallons per minute
HDS – Hydrodesulfurization
HHRA – human health risk assessment
IM – Interim Measures
MCL – maximum contaminant level
mg/kg – milligrams per kilogram
MNA – monitored natural attenuation
OMM – operations and maintenance management
OSHA – Occupational Safety and Health Administration
PAH – polycyclic aromatic hydrocarbons
RBC – risk-based concentration
RCRA – Resource Conservation and Recovery Act
RFI – RCRA Facility Investigation
SB – Statement of Basis
SVOC – semivolatile organic compound
SWMU – solid waste management unit
USACE – United States Army Corps of Engineers
U.S.C. – United States Code
EPA – United States Environmental Protection Agency
VOC – volatile organic compound
WPSC – Wheeling-Pittsburgh Steel Corporation
WVDEP – West Virginia Department of Environmental Protection
WVDNR – West Virginia Division of Natural Resources

I. INTRODUCTION

The United States Environmental Protection Agency (EPA) is issuing this Final Decision and Response to Comments (FDRTC or Final Decision) in connection with the Koppers Inc. (Koppers) Coal Tar Plant located to the northwest of Follansbee, Brooke County, West Virginia (Facility or Site).

The Facility is subject to the Corrective Action program under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) of 1976, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. Sections 6901 et seq. The Corrective Action program is designed to ensure that certain facilities subject to RCRA have investigated and addressed releases of hazardous waste and hazardous constituents that have occurred at their property.

On September 10, 2010, EPA issued a Statement of Basis (SB) in which EPA proposed a Final Remedy for the Facility. The proposed Final Remedy consisted of the following 4 components: a soils component (Soil Remedy); a sediment component (Sediment Remedy); a groundwater component (Groundwater Remedy) and Facility-wide Institutional Controls (ICs). The proposed Soil Remedy consisted of compliance with and maintenance of ICs. The proposed Sediment Remedy consisted of dredging and capping. The proposed Groundwater Remedy consisted of continued operation of the perched groundwater collection system and the expansion of the interim dense non-aqueous phase liquid (DNAPL) recovery system, as well as compliance with and maintenance of institutional controls. The last component of the proposed Final Remedy was Facility-wide Non-Engineering Controls. The Final Remedy is discussed in more detail in Section II, "Final Decision," below.

On September 10, 2010, consistent with public participation provisions under RCRA, EPA requested comments from the public on the proposed Final Remedy, EPA placed an announcement in the Weirton Daily Times to notify the public of and to request comments on EPA's proposed Final Remedy. The thirty (30) day public comment period began on September 10, 2010 and ended October 11, 2010. All of the comments received by EPA during the public comment period were carefully reviewed by EPA and have been addressed in Attachment A, PUBLIC COMMENTS AND EPA RESPONSES, and are incorporated into this Final Decision.

Based on comments received during the public comment period, EPA has determined that it is not necessary to modify its proposed Final Remedy as set forth in the SB. EPA is, however, making minor modifications to the factual background and clarifying certain aspects of the proposed Final Remedy as described in more detail in Attachment A, PUBLIC COMMENTS AND EPA RESPONSES. The Final Decision as set forth in Section II, "Final Decision," below, incorporates those minor modifications and clarifications.

II. FINAL DECISION

The Final Remedy consists of the Soil Remedy, the Sediment Remedy, the Groundwater Remedy, and Facility-wide non-engineering controls as summarized below:

(1) Soil – Institutional Controls

EPA's Soil Remedy is compliance with and maintenance of institutional controls. Institutional Controls are non-engineered instruments such as administrative and/or legal controls that minimize potential for human exposure to contamination and protect the integrity of the remedy. Because the Facility is currently used for industrial purposes and the contaminated portion of the Site is nearly completely covered with buildings, paved surfaces and other improvements, EPA has determined that Facility soils do not currently pose a threat to human health or the environment and require no further engineering controls at this time. However, because COCs remain in the soil at concentrations that exceed residential use and construction worker scenarios, EPA is proposing that institutional controls be implemented to prevent residential use and limit the potential for construction workers to be exposed to soils containing COCs.

The ICs shall be implemented through an enforceable mechanism such as an order or an Environmental Covenant pursuant to the West Virginia Uniform Environmental Covenants Act, Chapter 22, Article 22.B, §§ 22-22B-1 through 22-22B-14 of the West Virginia Code (Environmental Covenant). If the Facility owner or subsequent owners fail to meet their obligations under the enforceable mechanisms selected or if EPA, in its sole discretion, deems that additional ICs are necessary to protect human health or the environment, EPA has the authority to require and enforce additional ICs, such as the issuance of an administrative order.

(2) Sediment – Shallow Depth Removal with Cap

EPA's Sediment Remedy requires dredging the areas of shallow sediment containing the highest concentrations of PAHs and capping the dredged area and surrounding areas that contain PAH concentrations exceeding 100 mg/kg. The installation of a cap will isolate the material remaining in the dredged area and return the sediment surface to existing grade. This remedial strategy will remove and cap approximately 1.9 acres of near shore sediment to a depth of 2 feet, and 2.8 acres of mid-channel sediment to a depth of 3 feet. The actual rock size and thickness of the armor will be designed with input from the United States Army Corps of Engineer (USACE) to maintain the integrity of the cap to accommodate the impacts of ship navigation and prop wash. The lateral bounds of removal and capping will extend to approximately the 100 mg/kg PAH concentrations contour and this alternative will remove approximately 16,000 cubic yards (cy) of sediment. Dredging may be performed using a barge-mounted excavator with a closed bucket to best control the depth of the dredge cut and to control the release of suspended sediment and sheen. A close bucket dredge may also be used if the dredge depth can be closely controlled. Sediment (approximately 16,000 cy) will be dewatered or otherwise treated to meet Department of

Transportation (DOT) transportation requirements and will be transported and disposed of at an off-Site facility.

The capping will be placed over the dredged surface and will bring the grade to pre-dredge surface elevations. Two types of cap construction will be used based on flow rates for the Ohio River. The near shore cap will include an adsorptive layer (a reactive core mat or other absorptive granular organoclay product) and a sand and gravel isolation-filter layer (total cap thickness = approximately 24 inches). The offshore cap would include the reactive core mat/granular organoclay layer, a sand and gravel isolation-filter layer, and a cobble armor layer (total cap thickness = approximately 36 inches). Cap materials, including riprap along the shoreline, will be selected to provide isolation and protection of the underlying sediment from river flow, boat propeller wash, and other river surface-water movement, such as vessel wake and wind-driven wave action along the shoreline. The caps will be constructed to existing grade to minimize their effect on river navigation, flood control, and operation of the Facility dock. The cap along the shoreline may also include a narrow strip of riprap to protect both the cap and the existing shoreline from wind- and wake-driven waves. The design is conceptual, subject to modification based on modeling, detailed engineering design, and permitting.

Prior to and during dredging and cap placement, a coffer dam or an oil boom-silt partial depth silt curtain skirt array may be placed around the work area. An upstream structure may also be constructed to divert surface-water flow away from the work area. Based on input from the permitting agency USACE, these mitigation measures will be selected to minimize short-term impact on ship traffic and water quality impact from sediment disturbances during the construction.

A post-corrective measures operations and maintenance management (OMM) program will be established pursuant to an enforceable mechanism to be issued by EPA or West Virginia Department of Environmental Protection (WVDEP) to assess whether the protective cover was placed as intended, whether the elevation of the capped area is maintained, and whether the protective cover is effective in isolating residual PAH-containing sediment from surface water. Consistent with the USACE guidance document, monitoring will be conducted using a tiered approach designed to identify early warning signs that can be corrected relatively quickly and easily, if needed. EPA anticipates that a long-term monitoring program for this corrective measure will include periodic precision bathymetric surveys and inspections of the river for sheen. The bathymetric surveys would be the primary tool used to evaluate long-term integrity of the cap. Consistent with the USACE guidance, several methods are available to assess sediment surface elevation and cap thickness and one or more methods may be used depending on river conditions and results. If thresholds are not exceeded, it can be expected that the cap is performing as designed and periodic monitoring would continue.

If thresholds are exceeded, bathymetric surveys will be supplemented with underwater inspections made by divers. If frequent and significant sheens are observed, the underwater inspections will be expanded to include a more detailed evaluation of the cap’s performance.

Typical monitoring frequencies for capping are annually for the first 3 years and then once every 5 years for several cycles, with the flexibility to adjust the duration between monitoring events as data are collected over time and evaluated. The tiered approach will be detailed in an OMM Plan subject to WVDEP and/or EPA approval.

(3) Groundwater – Expanded DNAPL Recovery and Containment

EPA's Groundwater Remedy is the expansion of the existing DNAPL recovery well network and continued operation of the existing groundwater containment system (extraction and treatment) (Figure 8). DNAPL recovery would be expanded in the vicinity of recovery well R-225D where DNAPL recovery has been most successful, by converting monitoring well R-231D to a DNAPL recovery well of similar design to DNAPL recovery well R-225D. DNAPL would be recovered at well R-231D to increase the volume of DNAPL recovered from the base of Zone 3. R-231D has been targeted as a location for potential enhancement of DNAPL recovery because this well was tested in 2003 and showed a potential DNAPL recovery rate of up to 0.8 gallons per hour. In addition, well R-231D has consistently contained the greatest DNAPL thickness relative to the other Facility Zone 3 wells.

Performance monitoring of current DNAPL recovery rates would continue and would be used to optimize DNAPL recovery to the extent practicable; for instance, if existing recovery is declining to diminishing returns rate, EPA may require the installation of new wells to enhance recovery. The existing Zone 1 groundwater collection system would continue to operate indefinitely for as long as the Zone 1 concentrations have not met the remediation standard, and as a containment system to prevent or reduce lateral and downward migration of contaminated groundwater to Ohio River and the lower geological zone.

It is expected that monitored natural attenuation (MNA) will be an additional component of the groundwater remediation strategy at the time that DNAPL has been removed. Because it not possible to predict the duration of DNAPL removal or resulting change in the footprint of the future dissolved-phase plume, options for future remediation of dissolved-phase constituents in groundwater cannot be assessed at this time. EPA anticipates that groundwater recovery combined with MNA would remain the primary means by which dissolved-phase constituents would be remediated. In-situ enhancements to groundwater remediation, including possibly in-situ chemical oxidation, enhanced biological degradation, and/or reconfiguration of the network of the active groundwater recovery system elements will be evaluated only after DNAPL recovery has terminated.

(4) Facility Wide Non-Engineering Controls

EPA's Final remedy includes the following non-engineering controls that may be enforceable by an order or environmental covenant:

- Restrictions on the property deed to prevent conversion to residential use.

- Monitoring of future changes to Facility conditions that may alter the assumptions used in the ICs and human health risk assessment (HHRA) such as change in surface cover.
- Restrictions on potable use of groundwater in the Facility.
- Maintenance of surface covers in the contaminated areas to minimize surface water infiltration.
- Posting at the Facility identifying the soil locations exceeding the industrial RBCs at the Facility.
- Providing notice for the Facility containing information about the impacted groundwater to protect future on-site workers/contractors.
- A materials management plan that will guide how future workers will handle soil and groundwater during potential future subsurface construction work at the Facility.
- Development and implementation of a Health & Safety Plan by an appropriately qualified person familiar with the environmental conditions at the Facility, for excavation and disturbances to the subsurface soils, including utilities and process lines.
- Annual inspections and reporting to WVDEP regarding compliance with the covenant components for the area affected by the requirements.

In addition, regulations promulgated under the Rivers and Harbors Act of 1899**,** 33 U.S.C. 403**,** require that any alteration or obstruction of any navigable channel must be permitted by USACE. Such regulations cover construction, excavation, and deposition of materials in, over, or under waters of the Ohio River. These restrictions will help preserve the integrity of the cap installed for the Sediment Remedy.

III. FACILITY BACKGROUND AND HISTORY

The 34-acre Facility is located just north of the city of Follansbee in Brooke County, West Virginia (Figures 1 and 2). The Facility is bounded to the north, south, and east by a coke manufacturing facility owned and operated by the former Wheeling-Pittsburgh Steel Corporation (WPSC), which is now part of Severstal Wheeling, Inc. The Facility was first constructed in 1914 by the American Tar Products Company to operate as a tar distillation plant, producing creosote, road tar, and pitches. The current owner of the Facility is Koppers Inc. (Koppers), but in the last century of coal tar processing, the Facility has undergone multiple ownership and name changes.

In September 1990, EPA and Beazer East, Inc., former owner of the Facility, entered into an Administrative Order on Consent ("Order") pursuant to 42 U.S.C. §6928(h) of the Resource Conservation and Recovery Act (RCRA). The Order requires Beazer East (formerly known as Koppers Company, Inc. (Koppers Company)) to perform interim measures, a RCRA Facility Investigation and a Corrective Measures Study. For convenience of reference, "Koppers" in this document refers the current Facility owner/operator, Koppers Inc.; "Beazer East" refers to the entity that is obligated to perform the work under the Order, and "Koppers Company" refers to the prior name of Beazer East.

IV. SUMMARY OF PREVIOUS INVESTIGATION AND INTERIM MEASURES

The first reported investigations completed at the Facility focused on evaluating the seepage of perched groundwater from the Facility into the WPSC coal pits from along the base of the west wall of the coal pits. These investigations began in the mid-1950s. While the results of these investigations are not well documented, memoranda and other Koppers Company interoffice correspondence dating from the mid-1950s through the late 1970s indicate that a possible source of the water leaking into the WPSC coal pits was condensate and other process water from the Facility.

More detailed and better documented environmental investigation activities began at the Facility in the late 1970s. The majority of the investigations, completed between the late 1970s and late 1980s, focused on understanding the behavior of groundwater flow and extent of dissolved-phase chemicals of potential concern in groundwater. The scope of the investigations eventually expanded to encompass the entire Facility property, including portions of the Ohio River. The scope of the environmental investigations was expanded to include soil, sediment, and surface-water media beginning in 1993 during implementation of the RCRA Facility Investigation (RFI). Table 1 provides a summary of the previous investigations.

Based on the results of these previous investigations, EPA required implementation of groundwater and DNAPL monitoring and Interim Measure (IM) programs at the Facility pursuant to the IM provision of the Order. They included:

- <u>Site Improvements/Corrective Action/Interim Measures</u> - Starting in the 1970s several improvements were implemented at the Site to help prevent releases of contaminants of concern (COCs) from Site processes, and control or limit the migration of existing COCs in Site soil and groundwater. The following are the most significant of these Site improvements.
    - Paving the ground surface to provide an exposure barrier to soil and to limit infiltration of precipitation into the subsurface.
    - Closure and capping of the former wastewater aeration basins.
    - Installing physical barriers and implementing administrative procedures to restrict access by Site employees to areas of potential exposure to COCs.
    - Initiating a health and safety program designed to educate and protect Site personnel and contractors from exposure to COCs.
    - Improving product handling practices to reduce the potential for spills, and constructing containment systems to both contain potential spills and restrict their movement.

- Constructing and operating a wastewater treatment system (with periodic system improvements) to manage process water and collected Site surface water runoff.

- Perched Groundwater Collection System - Perched groundwater beneath the Site is captured by a collection system consisting of extraction wells and trenches installed in accordance with a 1984 Consent Decree, Civil Action No. 83-0127-W(K), issued jointly by EPA and the State of West Virginia to Wheeling Pittsburgh Steel Corporation and Koppers Company under the Clean Water Act. The system consists of five groundwater recovery wells installed between 1984 and 1986 at strategic locations to intercept perched groundwater discharging to seeps along the Ohio River embankment and adjacent to the WPSC coal pits. Perched groundwater recovered by this system is routed to the Site wastewater treatment plant. There have been various repairs and upgrades to the groundwater collection system over the years, including the installation of a piezometer network surrounding the recovery wells and trenches to monitor groundwater capture zones.
- DNAPL Removal - A DNAPL recovery system is currently operating at recovery well R-225D, located adjacent to the unloading station east of the Barge Dock. The current system was installed in April 2000 as an IM pursuant to the IM provision of the 1990 Order to address DNAPL pooled on the bedrock surface beneath this area of the Site. By end of 2009, a cumulative total of 84,000 gallons of DNAPL have been recovered at an average rate of about 577 gallons per month during the year. The recovered DNAPL is routed to a recycling facility on Site.

V. SITE CHARACTERIZATION

A. Surface-Water Hydrology

Surface-water drainage from the Facility is toward the Ohio River. The Ohio River flows from the north to the south along the west side of the Facility. The 100-year flood plain elevation is 668.5 feet above mean sea level, as recorded by the USACE, Pittsburgh District, Ohio River Basin Office. Most of the Facility (including all process areas) lies within either a Zone B or Zone C flood area designation (Federal Emergency Management Agency Flood Insurance Rate Map). Zone B areas are at elevations between the limits of 100-year and 500-year frequency flood elevation, while Zone C represents areas that are above the 500-year frequency flood elevation.

Stormwater from the process and storage areas of the Facility is collected and treated prior to discharge to the Ohio River under a National Pollutant Discharge Elimination System Permit, Number WV0004588, issued to the Facility by the West Virginia Department of Environmental Protection.

B. Groundwater Hydrology

The hydrogeologic system at the Site consists of four distinct hydrogeologic units. The first, described as the perched unit, refers to the groundwater in the fill material. The second consists of an underlying layer of fine-grained silty clay that has a low permeability that serves as a semi-confining base of the perched unit. The third unit consists of relatively pervious coarse alluvial material beneath the silty clay unit and above the bedrock. The fourth unit is bedrock consisting of sandstones and shales that are fractured and weathered near its surface and more competent with depth. The thicknesses of each unit are depicted on Figure 2.

The elevation of the groundwater observed within the perched unit is higher than the levels observed in the alluvial material below the silty clay. Perched groundwater flows radially from a groundwater mound in the north-central portion of the Site. Perched unit groundwater is not present in the vicinity of monitoring well R-123, located near the Site's southern property boundary.

Seepage of perched groundwater from the fill has been reported in the past along the embankment of the Ohio River and into the WPSC coal pits. Perched groundwater flowing toward the WPSC coal pits is intercepted by a groundwater collection trench system. A similar trench system collects perched groundwater flowing toward the river.

Groundwater from the alluvial unit discharges to the Ohio River under low to normal flow conditions; but the flow direction may reverse during periods of high river stage with the Ohio River providing recharge to the alluvial unit (RCRA Facility Investigation Report, ICF Kaiser, 1996).

Groundwater movement in the surficial bedrock is fracture-controlled, including bedding plane fractures. The competent bedrock below has much lower permeability where DNAPL is retarded from further downward migration and tends to pool at depressions.

C. Contaminants of Concern

1. Groundwater

Large numbers of groundwater samples have been collected at the Facility to characterize the nature and extent of the COCs. Initially, all samples were analyzed for a wider range of constituents. EPA reduced the groundwater sampling parameter list to the following list of COCs for the purpose of routine monitoring because these compounds are the only ones that exceeded December 2009 EPA Region 3 Risk-Based Concentrations (RBCs) for hypothetical potable use. EPA understands that the Facility is currently, and will be, for the foreseeable future, used for industrial purposes and the groundwater is not and will not be used as a potable water supply at the Facility.

List of Groundwater COCs

COCs	Perched Groundwater Zone	Shallow Alluvial Groundwater Zone	Deep Alluvial Groundwater Zone	Bedrock Groundwater Zone
VOCs	Benzene Chloromethane Ethlybenzene Styrene Toluene	Benzene Chloromethane Ethlybenzene Methylene Chloride Styrene Toluene 1,1,1-Trichloroethane Xylenes	Benzene Methylene Chloride Styrene Toluene	Benzene Chloromethane Ethylbenzene Methylene Chloride Styrene Toluene
SVOCs	2,4-Dimethylphenol 2-Methylphenol 4-Methylphenol Phenol	2,4-Dimethylphenol 2-Methylphenol 4-Methylphenol Phenol	2,4-Dimethylphenol 2-Methylphenol 4-Methylphenol Phenol	2,4-Dimethylphenol 2-Methylphenol 4-Methylphenol Phenol
PAHs	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene	Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenzo(a,h)anthracene Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Naphthalene Phenanthrene Pyrene
Inorganics	Arsenic Beryllium Chromium Lead Zinc	Arsenic Beryllium Chromium Cyanide Lead Mercury Nickel	Arsenic Beryllium Lead Nickel Zinc	Lead

2. Soil

Based on the results of the data screening provided in the Human Health Risk Assessment (HHRA) in the RFI Report, the following hazardous constituents were detected at maximum concentrations greater than EPA Region III industrial RBCs (December 2009) for surface and subsurface soils and, therefore, were identified as COCs.

List of Soil COCs

VOCs	Benzene	
SVOCs	2,4-Dimethylphenol	
PAHs	2-Methylnaphthalene	Acenaphthene
	Acenaphthylene	Benzo(g,h,i)perylene
	Chrysene	Dibenzofuran
	Fluorene	Naphthalene
	Phenanthrene	Benzo(a)anthracene
	Benzo(a)pyrene	Benzo(b)fluoranthene
	Benzo(k)fluoranthene	Fluoranthene
	Dibenzo(a,h)anthracene	Dibenzofuran*
	Indeno(1,2,3-cd)pyrene	Pyrene
Inorganics	Antimony	Arsenic
	Chromium	Lead

* - Retained due to lack of screening criteria.

3. Sediment

A risk screening assessment was prepared in the *Surface-Water/Sediment Investigation Report* (Blasland, Bouck & Lee, 2001). This screening assessment refined the input assumptions utilized in the RFI Report for evaluating potential ecological risks and compared sediment data to relevant benchmark screening criteria.The results of the tiered screening indicated that PAHs were the most prevalent COCs in sediments collected from the Ohio River bottom adjacent to the Facility. The 16 PAHs identified in the table below were reported at concentrations above sediment screening quality benchmarks and were, therefore, retained as COCs for sediment.

List of Sediment COCs

VOCs	None	
PAHs	Acenaphthylene	Acenaphthene
	Anthracene	Benzo(a)anthracene
	Benzo(a)pyrene	Benzo(b)fluoranthene
	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
	Chrysene	Dibenzo(a,h)anthracene
	Fluoranthene	Fluorene
	Indeno(1,2,3-cd)pyrene	Naphthalene
	Phenanthrene	Pyrene
Inorganics	None	

4. Surface Water

The RFI Report concluded that only bis(2-ethylhexyl)phthalate was observed in surface-water samples at concentrations greater than that which could potentially have effects on ecological receptors. Although bis(2-ethylhexyl)phthalate was retained as a surface-water COC, it was not a COC for any other media at the Site and, therefore, its presence in surface water is not believed to be Site-related.

Due to lack of screening criteria, 4-methylphenol was also retained as a potential COC in surface water. Nearly all historical surface-water samples collected from previous investigations contained no detectable PAH concentrations.

A risk screening assessment was included in the *Surface-Water/Sediment Investigation Report* (Blasland, Bouck & Lee, 2001) to refine the input assumptions utilized in the RFI Report for evaluating potential ecological risk issues and compare surface-water data to relevant benchmark screening criteria. Analytes in all surface-water samples collected during the Surface-Water/Sediment Investigation were either below the laboratory practical quantification limit or were detected below background or EPA Region 3 RBCs. Therefore, results indicate that constituents previously reported [bis(2-ethyl)phthalate and 4-methylphenol] are not Site-related, and groundwater discharge that is occurring does not appear to be having an adverse effect on the Ohio River.

D. Extent of Groundwater COCs

Groundwater monitoring indicates that the groundwater contains dissolved benzene, toluene, ethylbenzene, and xylene (BTEX); PAHs; and phenolic compounds at concentrations exceeding applicable maximum contaminant levels (MCLs) codified at 40 C.F.R. Part 141 and promulgated pursuant to the Safe Drinking Water Act, 42 U.S.C. §300f et seq., or EPA Region III tap water RBCs.

Perched Unit Groundwater:

- BTEX concentrations have been highest in the vicinity of monitoring well A-116, which is located near the WPSC property boundary and in the vicinity of monitoring well B-1, which is located at the northwest corner of the Facility.
- PAH concentrations have been highest in the vicinity of the naphthalene production and storage area, adjacent to the WPSC property boundary.
- Phenolic compound concentrations have been highest in the vicinity of monitoring well B-3, which is located at the top of the river embankment west of Area of Concern (AOC) 22 (North Tank Farm), beneath the naphthalene production and storage area.

Alluvial Unit Groundwater (Upper Portion):

- The concentrations of most parameters have been highest in the vicinity of AOC 22 (North Tank Farm), AOC 10 (Caustic Plant), and AOC 15 (Naphthalene Desulfurization).

- Concentrations of COCs have been commonly lower in the alluvium than in the perched unit groundwater.

Alluvial Unit Groundwater (Lower Portion):

- BTEX concentrations have been highest in the vicinity of wells OW-3C and R-211, located in the west-central and northern portions of the Facility, respectively.
- PAH concentrations have been highest beneath the southern end of AOC 22 (North Tank Farm).
- Phenol concentrations have been highest along the western side of the Facility between the main sump and the unloading station, adjacent to recovery well R-225D.

Bedrock Groundwater:

- BTEX and PAH concentrations have been highest in the vicinity of the tar stills at R-312.
- Phenolic compound concentrations have been highest at the northern end of the Facility near R-307.
- COC concentrations in bedrock groundwater have all been below applicable screening criteria beneath the southern portion of the Facility.

Evidence of DNAPL has been observed in the upper three hydrogeologic units at many soil borings and monitoring well locations within the north and central portions of the Facility (Figure 3). The largest accumulation of DNAPL beneath the Facility is pooled on the bedrock surface beneath the Unloading Station east of the barge dock, in the vicinity of DNAPL recovery well R-225D. DNAPL has migrated into the upper fractured portion of the bedrock, but there is no evidence that it extends into the competent bedrock below. Bedrock groundwater samples have not been collected in wells containing DNAPL such as recovery well R-225D. It is likely that groundwater, within bedrock in proximity to the DNAPL plume, also contains dissolved COCs.

E. Extent of Soil COCs

Over 120 soil samples were collected to characterize the extent of soil COCs at the Facility Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) (Table 2 and Figure 4). The COCs within the unsaturated portions of the fill have been observed at many locations across the Facility. The presence of phenolic compounds may correlate with potential source areas AOC 10 (the Caustic Plant), AOC 21 (the Acid Barreling Area), and AOC 14 (the Base Plant), which were identified as potential source areas for phenolic compounds.

Both volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) have been observed in unsaturated fill material; the highest concentrations were most frequently detected in samples collected immediately above the water table (Figure 5). The COCs within the unsaturated portions of the fill material have been observed at many locations across the Site. No correlation with SWMUs or AOCs was detected during RFI soil sampling, except at one location within AOC 13 (Pitch Pans and Pencil Pitch Area) and near SWMU 5 (Pencil Pitch Storage Pile) (Figure 4), where a black pitch-like material was observed in the soil samples. The presence of phenolic compounds may correlate with potential source areas AOC 10 (the Caustic Plant), AOC 21 (the Acid Barreling Area), and AOC 14 (the Base Plant), which were identified as potential source areas for phenolic compounds (ICF Kaiser, 1996). Locations where evidence of residual DNAPL was observed in soil during the installation of monitoring wells are noted on Figure 6.

F. Extent of Sediment COCs

Sediments in the Ohio River adjacent to the Facility contain PAH compounds and residual DNAPL, including weathered and hardened tar, related to historical Facility activities (Figure 7). The occurrence of PAHs and residual DNAPL in sediments is concentrated within an approximately 1,000-foot-long stretch of the Ohio River that extends approximately 225 feet outward from the shoreline. The area of highest total PAH concentrations in the river sediment, correlates with the approximate location of the historical Facility Outfall #3. PAH concentrations are highest near the surface of the river bottom and tend to decrease with depth below the river bottom surface. Visual evidence of residual DNAPL also appears to diminish with depth.

Sediment samples collected from locations upstream of the Facility demonstrated that there is an elevated background level of PAHs in Ohio River sediments related to other upstream industrial sources, urban runoff and other sources.

G. Extent of Surface-Water COCs

Few surface-water samples collected from the Ohio River in the vicinity of the Facility have contained detectable concentrations of analyzed constituents. Nearly all historical surface-water samples collected from previous investigations contained no detectable PAH concentrations. Bis(2-ethylhexyl)phthalate was observed at a concentration greater than what has been reported to have significant effects on ecological receptors for aquatic receptors exposed to surface water as part of their natural habitat. However, this potential aquatic receptor exposure assessment involved considerable uncertainty based on the following:

- Bis(2-ethylhexyl)phthalate is a common laboratory contaminant that was detected in most samples at similar low level concentrations both upgradient and adjacent to the Site;
- Bis(2-ethylhexyl)phthalate is not a site-related COC in any other environmental media evaluated for the Site;
- Bis(2-ethylhexyl)phthalate was not detected in historical surface water sampling events prior to 1996; and
- Fish and macroinvertebrate community studies performed by the West Virginia Division of Natural Resources (WVDNR) in 1991 at River Mile 68.1 and in 1992 at River Mile

76 have shown that the portion of the Ohio River affected by the Facility is supporting a flourishing variety of fish species including a number of gamefish.

VI. SUMMARY OF HUMAN HEALTH RISK ASSESSMENT

This section qualitatively summarizes the HHRA. The detailed quantitative HHRA is presented in Appendix A of the RFI Report.

A. Groundwater Exposure Pathways

Groundwater is considered an incomplete exposure pathway for the Facility because groundwater on the Facility is not used as a potable or industrial water source, and the Ohio River water quality adjacent to and immediately downstream from the Facility has met state and federal standards based on currently available data. Based on current groundwater quality, hypothetical future use of groundwater on Site as a potable supply for residential housing would not be acceptable to EPA as being protective of human health. However, no future residential development is planned for the Facility; therefore, EPA is selecting ICs to prevent future potable groundwater use.

B. Soil Exposure Pathways

The risk assessment incorporated traditional direct contact exposure pathways, such as incidental soil ingestion, incidental dermal contact with soil, and inhalation of dust associated with the mobilization of particulates in surface soil and inhalation of volatilized vapors released from subsurface soil among others for on-Site industrial worker receptors. It is important to note that these exposure pathways are hypothetical because the majority of the plant surface is paved or covered with structures. The pavement and structures prevent the routine direct contact required to complete these exposure pathways in most areas of the Facility, particularly in the tank farm and main process areas. For this reason, EPA has determined that there is no imminent health threat to on-Site workers via direct contact exposure pathway.

Potential future construction worker default conservative non-cancer hazard and theoretical excess lifetime cancer risk calculations yielded values that exceed traditional benchmarks (assuming disturbance of existing cover). For potential future construction workers at the Facility, personal protective equipment will be used during construction activities as appropriate. Even though the exposures are short-term and episodic and risks estimated in the HHRA are conservative, personal protective equipment would eliminate or significantly reduce the potential for exposure pathways to be completed during activities that disturb the soil.

C. Sediment Exposure Pathways

Concentrations of COCs within sediment in the Ohio River adjacent to the Facility are within acceptable human health risks, which include potential risks associated with dermal contact, incidental ingestion, and leaching of COCs from sediment to surface.

D. Surface-Water Exposure Pathways

EPA has determined that the surface-water quality in the Ohio River adjacent to the Facility is within acceptable limits and has met West Virginia Water Quality standards for protection of human health and the environment.

E. Air Exposure Pathways

Air emissions from the operation of the Facility are addressed under a site-wide air permit issued by the WVDEP and are not within the scope of the RCRA Corrective Action investigation of the Facility. Because the groundwater plume does not migrate beyond Facility boundaries, there is no potential impact on indoor air in off-site residences from the contaminated groundwater. Although the plume may be present beneath certain Facility buildings, they are constructed in a manner (e.g. partially open to the outside, or designed with balanced air ventilation systems) that will not allow a significant migration or accumulation of subsurface volatiles to indoor air.

VII. SUMMARY OF ECOLOGICAL RISK ASSESSMENT

The ecological risk assessment, provided in Section 8 of the RFI Report, quantitatively predicted marginal potential adverse effects to select ecological receptors exposed to surface water and more than marginal potential adverse effects for shoreline river sediments. The evaluation incorporated multiple conservative assumptions to ensure that true effects are not under-predicted. The ecological risk assessment process was intended as a screening level assessment with conservative assumptions that would tend to over-predict the potential risk. A summary of the evaluation for each media is provided in the following sections.

A. Soil

The results for surface soil in the western embankment area indicated that COCs were not at concentrations that would likely have adverse effects on terrestrial fauna based on available literature benchmarks consulted during preparation of the ecological risk assessment. No stressed vegetation was observed in this area during the vegetation survey.

COC concentrations that were observed were commonly less than those that may cause adverse effects on two of the three terrestrial vertebrates selected for quantitative evaluation. Based on highly conservative assumptions, one COC (phenanthrene) had an ecological quotient that marginally exceeded the hazard quotient for the American robin. One other COC [benzo(a)pyrene] had an ecological quotient that marginally exceeded the hazard quotient for the Eastern cottontail rabbit. Five COCs (benzo(a)anthracene, benzo(a)pyrene, fluoranthene, phenanthrene, and pyrene) for the third terrestrial receptor selected (Short-tailed shrew) were observed at concentrations greater than those that might produce adverse effects.

B. Sediment

PAHs are present in Ohio River sediments off shore from the Facility at concentrations that exceed ecological sediment screening quality benchmarks and may produce adverse effects on aquatic receptors, and in particular, on benthic macro-invertebrates. Although other constituents, primarily inorganic, are present in the sediments, they are not as widespread as PAHs, and their concentrations are lower or comparable to concentrations detected at upstream reference locations. Consequently, these other constituents were eliminated in the tiered screening process.

Conclusions drawn from a literature review report[1] by AMEC indicated that the benthic macro-invertebrates would not be expected to experience adverse effects at PAH concentrations below 200 mg/kg (and possibly higher) in sediment. EPA agrees with AMEC conclusions and established a more conservative sediment corrective action standard of 100 mg/kg for total PAHs in sediment, which is formalized in a letter to Beazer East, dated February 6, 2008.

C. Surface Water

Bis(2-ethylhexyl)phthalate was observed at a concentration greater than what has been reported to have significant effects on ecological receptors for aquatic receptors exposed to surface water as part of their natural habitat. However, this potential aquatic receptor exposure cannot be definitively linked to the Facility because:

- Bis(2-ethylhexyl)phthalate is a common laboratory contaminant that was detected in most samples at similar low-level concentrations both upgradient and adjacent to the Facility.
- Bis(2-ethylhexyl)phthalate is not a Facility-related COC in any other environmental media evaluated for the Facility.
- Bis(2-ethylhexyl)phthalate was not detected in historical surface-water sampling events prior to 1996.

Fish community studies performed by the WVDNR have shown that the reach of the Ohio River affected by the Facility is supporting a flourishing variety of fish species, including a number of game fish.

---

[1] Literature review of papers reporting on the toxicity of pyrogenic PAH in sediments, AMEC Earth & Environmental, Inc., submitted to EPA on December 1, 2006.

VIII. CORRECTIVE ACTION OBJECTIVES

Based on the findings set forth in the RFI, EPA has determined that past operations at the Facility have caused unacceptably high concentrations of COCs in soil, groundwater, and sediment.

Soil - The corrective action objective for soil is to leave it in place by maintaining restrictions to direct contact exposure to soil containing COCs that exceed the media-specific standards by implementation of ICs. Since the majority of the plant surface is paved or covered with structures, the likely exposure pathway for contaminated soils would be potential future construction and the likely receptors would be construction workers who will be protected by OSHA and health and safety guidelines to be developed. ICs such as land use restrictions will prevent the highly unlikely change of the site in the future from industrial to residential use.

Groundwater - The primary corrective action objectives for groundwater are to:

- Isolate, contain, and/or remove DNAPL from productive pools to remove source mass to the extent that monitored natural attenuation (MNA) may be implemented as a viable strategy.
- Control seeps from the perched fill unit.
- Restore groundwater quality for beneficial use, including achieving MCLs while recognizing that these standards will take decades to achieve.

Sediment - The corrective action objectives for sediment include the following:

- Protect the benthic ecological community in areas of known or potential ecological toxicity.
- Isolate, contain, and/or remove known sources of sheens.
- Control the release of oils and sheens consistent with the West Virginia Water Quality Criteria.

Surface Water - Sediment and groundwater corrective measures are being performed, in part, to protect surface-water quality. Because historical PAH concentrations in surface water have been either below practical laboratory quantification limits, or at concentrations below background or conservative risk-based screening levels, no corrective measures are proposed or warranted for surface water. As a result, no corrective action objectives have been established for surface water.

Air - No additional corrective measures have been selected for air emissions because the Facility operates under a site-wide Permit to Operate pursuant to Title V of the Clean Air

Act issued by WVDEP in accordance with West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30s requirements of the Clean Air Act Amendments of 1990 air discharge permit and operates under Occupational Safety and Health Administration (OSHA) standards where EPA Permissible Exposure Limits have been established and proper precautions are taken for worker safety. As explained in Section VI.E., there has been no evidence of vapor intrusion or impacts to off-site properties. Because no additional corrective measures are necessary for air emissions, no corrective action objectives have been established for this media.

IX. REMEDIATION STANDARDS

EPA has identified the following remediation standards for the COCs or indicator parameters for each media. The remediation standards were selected based on applicable federal and state requirements, or EPA Region III RBCs if applicable requirements do not exist.

A. Soil - The remediation standards for soil are based on EPA December 2009 industrial soil RBCs as listed below:

EPA Region 3 RBC table for soil December 2009	COC	Industrial Soil mg/kg	COC	Industrial Soil mg/kg
VOCs	Benzene	5.4E+00		
SVOCs	Dimethylphenol, 2,4-	1.2E+04		
PAHs	~Methylnaphthalene, 2-	4.1E+03	~Dibenzofuran	1.0E+03
	~Chrysene	2.1E+02	~Naphthalene	1.8E+01
	~Fluorene	2.2E+04	~Benz[a]anthracene	2.1E+00
	~Benzo[a]pyrene	2.1E-01	~Benzo[b]fluoranthene	2.1E+00
	~Benzo[k]fluoranthene	2.1E+01	~Fluoranthene	2.2E+04
	~Dibenz[a,h]anthracene	2.1E-01	~Dibenzofuran	1.0E+03
	~Indeno[1,2,3-cd]pyrene	2.1E+00	~Pyrene	1.7E+04
	~Acenaphthene	3.3E+04		
INORGANICs	Antimony (metallic)	4.1E+02	Arsenic, Inorganic	1.6E+00
	Chromium(III), Insoluble Salts	1.5E+06	~Lead and Compounds	8.0E+02

B. Groundwater – For DNAPL in groundwater, the remediation standard is removal to the maximum extent practicable or less than 0.1 inch. For dissolved phased contaminants in groundwater, the remediation standards are the applicable Maximum Contaminant Levels (MCLs) promulgated at 40 C.F.R. Part 141 pursuant to Section 1412 of the Safe Drinking Water Act, 42 U.S.C. Section 300g(1). If no MCL has been established for a contaminant, then the remediation standard will be the applicable WVDEP Voluntary Remediation DeMinimis Groundwater Value, or the EPA Region 3 RBC value for tap water if no WVDEP Voluntary Remediation DeMinimis Groundwater Value has been established.

Groundwater Standards	Analyte	EPA RBC Dec 09 ug/L	WVDEP Remediation Deminimis Groundwater values ug/l	MCL ug/L
	Benzene	4.1E-01		5.0E+00
	Chloromethane	1.9E+02		
	Ethylbenzene	1.5E+00		7.0E+02
VOCs	Methylene Chloride			5.0E+00
	Styrene			1.0E+02
	Toluene			1.0E+03
VOCs	Trichloroethane, 1,1,1-			2.0E+02
	Xylenes			1.0E+04
SVOCs	Dimethylphenol, 2,4-	7.3E+02		
	Phenol	1.1E+04		
	~Acenaphthene		3.7E+02	
	~Anthracene		1.8E+03	
	~Benz[a]anthracene	2.9E-02		
	~Benzo[a]pyrene			2.0E-01
	~Benzo[b]fluoranthene	2.9E-02		
PAHs	~Benzo[k]fluoranthene	2.9E-01		
	~Chrysene	2.9E+00		
	~Dibenz[a,h]anthracene	2.9E-03		
	~Fluoranthene	1.5E+03		
	~Fluorene		2.4E+01	
	~Indeno[1,2,3-cd]pyrene	2.9E-02		
	~Naphthalene	1.4E-01		
	~Pyrene		1.6E+02	
	Arsenic, Inorganic			1.0E+01
	Beryllium and compounds			4.0E+00
INORGANICs	Chromium, Total			1.0E+02
	Cyanide (CN-)			2.0E+02
	Lead			1.5E+01
	Mercury			2.0E+00

C. Sediment – EPA has selected 100 mg/kg total PAHs as the appropriate remediation standard for sediments. The standard is applicable to the shallow bioactive layer in the top one foot of the river sediment based on literature review of sediment toxicity testing data from wood treating sites with creosote sediment contamination. Scientific justification of this standard identification was approved by EPA in letters to Beazer East, dated February 13, 2007 and February 11, 2008, which are included in Appendix E of the 2009 Corrective Measures Study prepared by Beazer East pursuant to the Order.

D. Surface Water – No remediation for surface water is required as no site-related contaminants tested during the Surface-Water/Sediment Investigation were found to exceed State of West Virginia Requirements Governing Water Quality Standards (47 CSR 2) established for the portion of Ohio River affected by the Facility.

E. Air – Air remediation is outside the scope of the Order because ambient air quality is regulated by a Facility-wide Permit to Operate pursuant to Title V of the Clean Air Act issued by WVDEP in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§ 22-5-1 et seq.) and 45CSR30s. Because the plume does not migrate beyond property boundaries, there is no concern regarding potential impacts to indoor air in off-site residences from the contaminated groundwater. Although the plume may be present beneath certain Facility buildings, they are constructed in a manner (e.g. partially open to the outside, or designed with balanced air ventilation systems) that will not allow a significant migration or accumulation of subsurface volatiles to indoor air.

X. EVALUATION OF EPA'S FINAL REMEDY

This section provides a description of criteria EPA used to evaluate the remedies for the Facility under the Corrective Action Program. The criteria were applied in two phases. In the first phase, EPA evaluated three remedy threshold criteria as general goals. In the second phase, EPA evaluated seven balancing criteria to determine which proposed remedy alternative provided the best relative combination of attributes.

A. Threshold Criteria

(1) Overall Protection of Human Health and the Environment

EPA's Final Remedy is protective of human health and the environment. With respect to the Soil Remedy, pavement and Facility structures eliminate the direct contact exposure pathway in most areas of the Facility, particularly in the tank farm and main process areas and the other paved areas. For this reason, EPA has determined that there is no imminent threat to public health associated with on-site workers or the environment.

Therefore, under current land use conditions, contaminated soil can be left in place with no unacceptable health risks. EPA's Soil Remedy requires implementation of institutional controls to prevent potential future exposure due to unanticipated land use change or potential future construction activities that may deviate from the current exposure scenario.

For sediment, the top 2-foot bioactive layer that exceeds the remediation standard set forth in Section IX.C. will be removed and additional material will be removed, as necessary, to accommodate the thickness of cap that may include a sand filtering layer, an adsorptive media barrier, and an armoring layer. This work will extend over the entire horizontal extent (approximately 4.7 acres) where total PAH concentrations exceed 100 mg/kg remediation standard. The remedy, combined with performance monitoring, will provide long-term isolation of biota and humans from direct contact exposure to deeper residual PAHs.

For groundwater, the perched groundwater collection system, which has been operating at the Facility since 1983 and the DNAPL recovery system have reduced the source mass of COCs remaining on site. Approximately 80,000 gallons of DNAPL have been recovered, and approximately 100 million gallons of water have be captured and treated over the lifespan of the groundwater IM. The expansion of the DNAPL recovery system and perched groundwater collection system, as well as continued monitoring and the implementation of groundwater use restrictions will ensure long-term protectiveness to human health and the environment. EPA is requiring that institutional controls prohibiting groundwater use be maintained while the groundwater is being remediated to prevent future potential exposure to COCs.

(2) Attainment of Media Cleanup Standards

The Soil Remedy meets the soil remediation standards set forth in Section IX.A. There are no exposed soils at the Facility that exceed industrial screening criteria. The implementation of institutional controls will protect against future land uses that may deviate from the current land use. These controls will also provide guidance to the owner when utility and construction workers must excavate beneath the existing direct contact exposure barrier that isolate**s** soil that may contain COCs that exceed the media-specific standard.

The Sediment Remedy will remove and cap shallow PAH-impacted sediments that exceed the 100 mg/kg concentration laterally, and up to 2 to 3 feet vertically.

The Groundwater Remedy meets the objectives of greatly reducing the source mass of COCs through the recovery of DNAPL with the long-term goal of achieving MCLs for the groundwater COCs. In addition, the Final Groundwater Remedy will eliminate human exposure to groundwater via groundwater use restrictions until such time that natural attenuation can be completed. MCLs will be achieved only after the DNAPL source mass has been largely or entirely removed.

(3) Source Control

Historically, DNAPL source material migrated downward through the hydrogeological units to create a pool of DNAPL at or near the top of the lower-permeability bedrock. The soil column through which the DNAPL passed now likely contains DNAPL that is at residual saturation, which thereby limits its mobility. As a source control measure, the pooled DNAPL on the bedrock is being, and will continue to be, recovered. In addition, the groundwater extraction systems have further reduced and will continue to reduce the secondary source mass of COCs dissolved in groundwater.

The Sediment Remedy requires that the highest concentration PAH-contaminated sediments be removed and capped, which will further reduce the secondary source of COCs in the sediments from leaching into the water column.

B. Balancing Criteria

EPA has determined that the Final Remedy is protective of human health and the environment, therefore, evaluation of alternatives, with the exception of sediment, is unnecessary. Nevertheless, because EPA has selected active remediation for sediment and groundwater, EPA presents the five criteria below to substantiate the protectiveness of the Sediment and Groundwater Remedies:

(1) Long-Term Reliability and Effectiveness

For soil, institutional controls that limit the potential future use at the Facility to industrial and engineering controls that maintain a ground surface exposure barrier will provide a long-term reliable and effective remedy for soil.

For sediment, direct laboratory measurement of DNAPL mobility within site-specific sediment samples, direct field observations of the vertical distribution of residual DNAPL in the sediment column, and theoretical calculations of the potential for density driven movement of DNAPL within the sediment (Appendix D of the Corrective Measures Study [ARCADIS, 2009]) all conclude that upward vertical movement of DNAPL within the sediment column is extremely unlikely. Therefore, naturally existing limitations to movement of the residual DNAPL alone will provide a long-term reliable and effective remedy. In addition to the existing conditions that restrict the movement of DNAPL, the Sediment Remedy will provide additional measures of protectiveness through partial removal of shallow sediment containing concentrations of PAHs greater than 100 mg/kg and isolation of that material via installation of a multilayer cap. One layer of the cap will provide adsorptive capacity to strip PAHs that may adhere to gas bubbles (generated by ambient, naturally occurring microbial activities) that may transport these PAHs to the surface via a process called ebullition. The filter and armor cap layer components of the multi-layer cap will provide a clean substrate for biological activity and further isolate underlying sediment and provide long-term protection of the cap from erosion.

After completion of the cap construction, implementation of an Operation and Maintenance Management Plan and routine monitoring will be conducted to evaluate the long-term overall effectiveness, permanence, and integrity of the cap and will detect cap erosion, if it were to occur. Depending on the extent of cap damage, the cap could likely be repaired using the same technology and procedures as used to initially place the cap. Most repairs could likely be made without disturbing the underlying sediment. Repair and replacement could be costly, however, as it would involve the same mobilization and on-water equipment and materials as the original corrective measures.

The Groundwater Remedy, which includes expanding the existing DNAPL recovery system at the Facility and continuing operation of the existing perched groundwater collection system, will also help reduce the flow of groundwater to potential seepage faces along the embankment of the Ohio River and WPSC coal pits. This portion of the Final Remedy would potentially also remove an increased volume of relatively easily recoverable DNAPL by expanding the existing DNAPL recovery system to include a new DNAPL recovery well at existing monitoring well R-231D. DNAPL recovery from this monitoring well could be relatively significant based on historical pilot testing of this well. It is possible that by increasing the rate of DNAPL recovery, the time to meet remediation standards could be slightly reduced.

(2) Reduction of Waste Toxicity, Mobility, or Volume

The IC component for soils will ensure continued reduction of the mobility of COCs in soil by preventing land use changes, and ensuring maintenance of impervious land covers (pavement, building, and structures) to minimize rainfall infiltration.

The Sediment Remedy will partially remove and cap shallow sediments containing COCs above the sediment remediation standard. The removal and capping of shallow-impacted sediments will reduce both the volume and mobility of residual COCs remaining in the sediment.

The Groundwater Remedy includes expansion of the interim DNAPL recovery system and groundwater collection system to remove source mass from the subsurface and capture and treat impacted shallow-perched groundwater. The reduction of the pool of DNAPL will both reduce the potential mobility of that pool and will reduce the mass/volume of this secondary source. The operation of a groundwater extraction system will further control the mobility of the COCs and will reduce the overall mass of COCs in groundwater.

(3) Short-Term Effectiveness

The Soil Remedy is effective in that it will limit the potential for direct contact exposure. In addition, institutional controls will further reduce the potential for short-term exposures by preventing any land use changes.

For sediment, construction dredging, and to a lesser extent capping, are likely to create short-term adverse effects. Dredging both during sediment and cap placement is likely to cause some suspension of PAH-containing sediments. Resuspended sediments could be redeposited inside of the dredged area and would be covered by the cap and, to a lesser degree, move and redeposit outside of the remediation area. Given the dredging equipment, operational procedures, hydraulic controls, and the granular nature of most of the sediment being dredged, the majority of sediments resuspended during dredging are expected to settle within the area that will be capped. Dredging of sediments containing residual DNAPL could also create sheen on the water surface. These releases would be controlled, using an oil boom-silt curtain skirt array that covers the upper portion of the water column. An upstream flow diversion structure may also be erected to limit the surface-water flow velocity through the work area to reduce the potential transport of resuspended sediment to areas outside of the sediment remediation area. Visual observation and water quality monitoring would be used to monitor short-term resuspension and would provide the basis for implementing and measuring the short-term effectiveness of the sediment remedy.

Because the DNAPL pool in groundwater is still relatively productive, DNAPL removal remains the most effective means of short-term source mass removal in groundwater.

(4) Implementability

The Soil Remedy is readily implementable in that the remedy only requires putting in place ICs which would prevent future uses of the land inconsistent with the remedy and maintenance of a direct contact exposure barrier.

The Sediment Remedy is readily implementable. Dredging and capping materials, equipment, and technology are commercially available and have been used successfully on other sites under similar conditions. Significant coordination with other boat traffic would be necessary when working in the heavily used river channel. When possible, an open navigable channel would be maintained. If construction activities necessitated partially blocking or closing the channel, it would be scheduled to create as little disruption of river traffic as possible.

Dredging, especially those sediments containing residual DNAPL, would create some sediment resuspension, and likely, the appearance of some sheen. These water quality issues would be controlled to the extent practicable. The control of such occurrences of sheens could affect production rates, extend the duration of on-water activity, and ultimately increase costs. The movement, repair, and replacement of surface-water controls, such as an oil boom-silt curtain array or the upstream flow diversion components, could further complicate the logistics of coordinating with boat traffic on the river. Dredged sediment would be staged in the upland area, dewatered or stabilized to meet DOT requirements. The dredging depth along the shoreline is approximately 1 foot; therefore, minimal impacts associated with shoreline stability are expected. The relatively small dredge volume also reduces the area needed for upland areas to dewater, stabilize, stage, and ship the sediment. After processing, the stabilized sediments would be loaded into trucks or barges and disposed at an appropriately permitted off-Site facility. The methods for handling, dewatering, and stabilizing the sediment are routinely used and would be effective at managing the material for transport. If dewatering were used, the water generated would be treated and/or disposed using conventional and approved methods.

The Groundwater Remedy requires a modification to the existing IM program by adding limited new recovery wells to the system; therefore, it would be readily implementable and would likely have no significant physical or technical limitations.

Existing monitoring well R-231D would be converted into a DNAPL recovery well of similar design. This well would operate in a manner similar to that for recovery well R-225D, thereby requiring minimal design and modeling. The design would likely be supplemented by field testing to determine the appropriate pump and piping size and flow rates. The piping from R-231D would be plumbed into the existing DNAPL recovery system operating at R-225D. Once in operation, R-231D would be monitored at the same frequency as R-225D.

(5) Cost

The total cost of the Final Remedy, as estimated by Beazer East, is 8.2 million dollars in capital outlay, and 1.5 million dollars in operation costs for the next 30 years based on the following assumptions.

The Soil Remedy is expected to have a relatively low cost to implement because the work to construct impervious covering throughout the contaminated portion of the Facility has already been completed, and the additional costs associated with administration of the ICs to maintain the covering is minimal compared to the capital costs of the Soil Remedy. There will also be periodic evaluations of Site conditions to ensure that Facility conditions continue to appropriately restrict the potential for direct contact exposure to soil containing elevated concentrations of COCs.

The Sediment Remedy is expected to have a relatively higher cost of implementation than the no action/monitored natural recovery and cap only alternatives, but relatively lower costs of implementation than the hot spot removal with cap or the full removal alternatives.

Costs would include:

- Dredging and disposal of 16,000 cy of sediment.
- Materials and installation of the 4.7-acre cap.
- Construction of an upland sediment dewatering and staging facility.
- Surface-water controls, such as an oil boom-silt curtain skirt array or an upstream diversion.
- Post-construction monitoring.

Although the cost of the Groundwater Remedy is relatively high compared with the three other groundwater alternatives evaluated, the absolute costs should be relatively low because the treatment of water and power to operate the systems are incrementally small when considered in terms of the concurrent operation of the wastewater treatment plant used at the Facility. The costs that will be incurred include:

- Design costs and capital costs for installation of DNAPL recovery system at R-231D.
- OMM costs for four existing perched groundwater recovery wells (RW-1, RW-2, RW-4C, and RW-5) and associated trenches and treatment systems.

- OMM of the DNAPL recovery systems at R-225D and R-231D, including disposal of recovered DNAPL.

The Facility will be required to provide financial assurance to implement the remedy. EPA anticipates that the remedy will be implemented under an enforceable mechanism issued by EPA or WVDEP under available legal authorities which will include a financial assurance component.

(6) Community Acceptance

EPA held a public comment period on its proposed remedy beginning on September 10, 2010 and ending on October 11, 2010. The only comments received during the public comment period were submitted by the current and former owners of the Facility. The comments and EPA's responses are set forth herein.

(7) State Acceptance

The Final Remedy for the Facility has been evaluated and approved by the WVDEP. Furthermore, EPA has solicited state input throughout the investigation process.

XI. DECLARATION

Based on the Administrative Record compiled for this Facility, I have determined that the Final Remedy as set forth in this Final Decision and Response to Comments is appropriate and protective of human health and the environment.

Abraham Ferdas, Director	3/3/11 Date

Land and Chemicals Division

EPA Region III

REFERENCES

AMEC Earth & Environmental (AMEC). 2005. Technical Memorandum: Summary of Benthic Macroinverebrate Toxicity Investigation at Five Wood Treating Sites. September 29.

AMEC. 2006a. Technical Memorandum: Update of Revised Analysis of the Interpretation of PAH Toxicity Data at Five Wood Treating Sites Based on USEPA Region III's March 27, 2006 Comments. May 15.

AMEC. 2006b. Technical Memorandum: Literature Review of Papers Reporting on the Toxicity of Pyrogenic PAH in Sediments. December 1.

ARCADIS US, Inc. 2008. Corrective Measures Study, Koppers Inc. Coal Tar Plant, Follansbee, West Virginia. Prepared for Beazer East, Inc. April, 2008.

Blasland, Bouck, & Lee, Inc. 2004. CMS Pre-Design Report, Koppers Follansbee, West Virginia Coal Tar Plant. Prepared for Beazer East, Inc. March, 2004.

Blasland, Bouck, & Lee, Inc. 2001. Surface Water/Sediment Investigation Report, Koppers Coal Tar Plant, Follansbee, West Virginia. Vols. I and II. Prepared for Beazer East, Inc. August, 2001.

Blasland, Bouck, & Lee, Inc. 2000. RCRA Facility Investigation Report, Koppers Coal Tar Plant, Follansbee, West Virginia. Vols. I and II. Prepared for Beazer East, Inc. September, 2000.

D'Appolonia Consulting Engineers, Inc. 1982. Groundwater Study Final Report, Follansbee Plant, Follansbee, West Virginia. Project No. 80-442. Prepared for Koppers Company, Inc., Pittsburgh, Pennsylvania.

ICF Kaiser Engineers, Inc. 1992. RCRA Facility Investigation/Corrective Measures Study (RFI/CMS) Work Plan, Follansbee, West Virginia, Volumes I-III, Koppers Industries, Inc., Follansbee, West Virginia. Prepared for Beazer East, Inc., Pittsburgh, Pennsylvania.

ICF Kaiser Engineers, Inc. 1996. RCRA Facility Investigation Report, Follansbee, West Virginia, Volumes I-II, Koppers Industries, Inc., Follansbee, West Virginia. Prepared for Beazer East, Inc., Pittsburgh, Pennsylvania.

Koppers Company, Inc., Quagliotte, J.A. 1981. Hydrogeologic Study, Follansbee Plant, Draft Report.

Koppers Company, Inc., Stroebel, K.H. 1984. Hydrogeologic Assessment of the Perched Aquifer Condition, Koppers Company, Inc., Follansbee, West Virginia.

Koppers Company, Inc., Stroebel, K.H. 1986. Report of Findings, Alluvial Aquifer Investigation, Koppers Company, Inc., Follansbee, West Virginia.

Koppers Industries, Inc. 1950 – 1978. Various Interoffice Correspondences

TABLE 1
SUMMARY OF PREVIOUS INVESTIGATIONS

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

Investigation	Date	Scope	Preliminary Findings/Conclusions	Reference
1978 Groundwater Investigation	1978	• Installed and sampled 14 monitoring wells in northern area of the Site and along WPSC/Site property line. • Installed two pumping wells along Ohio River to stop river embankment seeps.	• Groundwater flow direction west toward Ohio River. • High concentrations of phenol present in groundwater beneath former acid tar plant.	Memoranda and other Koppers Company inc. interoffice correspondence (1950 – 1978)
Hydrogeologic Study, Follansbee Plant	1980	• Installed and sampled 28 monitoring wells along Ohio River and WPSC coal pits.	• Water seeping into west side of WPSC coal pits was coming from the Site. • Fill material is underlain by clay creating perched groundwater. • Perched groundwater contained dissolved VOCs and SVOCs. • Perched groundwater drained down into alluvial sediments along Ohio River embankment where clay layer not present.	Koppers Company, inc., 1981
Groundwater Study Final Report, Follansbee Plant	1981	• Installed and sampled 21 monitoring wells screened within perched and alluvial units. • Sampled seeps along Ohio River embankment.	• Concentrations of phenol in perched unit groundwater highest near center of the Site. • Concentrations of phenol in alluvial unit groundwater highest beneath northern end of the Site. • Elevated concentrations of TOC, oil and grease, and phenol detected in river embankment seep samples.	D'Appolonia, 1982
Hydrogeologic Assessment of the Perched Aquifer Condition	1984	• Installed four monitoring wells and eight soil borings to define extent of clay layer along the Ohio River. • Installed two pumping wells to investigate hydraulic properties of fill. • Installed two perched groundwater collection trenches with five extraction wells: one collection trench parallel to Ohio River, adjacent former acid tar plant; one collection	• Clay layer is continuous along Ohio River (reinterpreted relative to reports from previous investigations). • Groundwater collection trenches would be more efficient than wells in preventing perched groundwater from reaching the Ohio River and WPSC coal pits.	Koppers Company, inc., 1984

TABLE 1
SUMMARY OF PREVIOUS INVESTIGATIONS

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

Investigation	Date	Scope	Preliminary Findings/Conclusions	Reference
		trench parallel to WPSC coal pits along eastern side of the Site.		
Report of Findings, Alluvial Aquifer Investigation	1985 and 1986	• Sampled groundwater from 22 alluvial unit wells. • Installed seven monitoring wells in alluvial and perched units at the wastewater treatment system aeration basins to satisfy RCRA interim status groundwater monitoring requirements.	• Results of groundwater samples from 22 alluvial unit wells: detected several VOCs and SVOCs. • Detected PAHs in both perched and alluvial unit groundwater at seven aeration basin wells, at lower concentrations in alluvial unit.	Koppers, 1986
Fenceline Air Emissions Monitoring Program Results	1987	• Collected samples of ambient air at property boundaries to measure fugitive emissions of particulate matter from vehicular traffic or wind.	• Concentrations of PAHs in ambient air increase in direction of prevailing wind, with lowest concentrations at the barge dock and gatehouse along southern perimeter, and highest concentrations at Pencil Pitch Area, Tar Truck Loading Area, North Tank Farm, and in the Acid Barreling Area in northern portions of the Site.	ICF Kaiser, 1992 (Appendix G)
RFI	1993 to 1996	• Installed 50 soil borings and collected soil samples. • Collected 40 surface-water samples from Ohio River adjacent to the Site. • Collected 10 background surface-water samples from Ohio River upstream from the Site. • Collected 14 sediment samples from Ohio River adjacent to the Site. • Collected three sediment samples from Ohio River embankment seep locations. • Collected 10 surface soil samples from Ohio River embankment. • Installed 45 monitoring wells in perched, alluvial and bedrock units.	• Perched groundwater seeps to WPSC coal pits and Ohio River embankment. dramatically reduced by paving the Site area • COPCs within the unsaturated portions of the fill are widely distributed across the Site and show little correlation with SWMUs or AOCs. • Historical releases of source material to the Ohio River are likely the cause of elevated PAH concentrations in sediment samples. • Human health risk assessment predicted COPCs in soils, sediments, and groundwater pose no imminent threat to human health. • Human health risk assessment predicted no	ICF Kaiser Engineers, 1996 BBL, 2000

TABLE 1
SUMMARY OF PREVIOUS INVESTIGATIONS

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

Investigation	Date	Scope	Preliminary Findings/Conclusions	Reference
		• Installed two pump test wells in alluvial unit. • Rehabilitated and redeveloped existing monitoring wells. • Installed piezometer and stilling well in Ohio River at barge loading and unloading dock. • Sampled groundwater from 51 monitoring wells. • Evaluated the nature and extent of DNAPL in Site monitoring wells. • Sampled DNAPL from Site monitoring wells. • Completed aquifer characterization tests, including pumping tests, slug tests, and packer tests. • Completed groundwater usage survey. • Completed seismic refraction survey to evaluate bedrock surface beneath the Site. • Completed ecological and human health risk assessments.	threat to human health posed by surface water. • Ecological risk assessment predicted marginal potential adverse effects to select ecological receptors exposed to embankment soils and more elevated potential adverse effects for exposure to shoreline river sediments, under conservative assumptions.	
Additional RFI Activities	1999 to 2000	• Completed study of Ohio River embankment fill consisting of an aerial survey, site reconnaissance, and test pitting. • Installed two perimeter monitoring well clusters in perched and alluvial units at northern and southern ends of the Site, and sampled groundwater. • Installed DNAPL recovery well R-225D downgradient from former acid tars distillation plant. • Installed nine DNAPL delineation wells in vicinity of R-225D. • Completed evaluation of perched groundwater	• DNAPL is present within much of the overburden material beneath the Site (including fill, alluvium, and bedrock), especially in the northern portion of the Site in the vicinity of well R-225D. • At R-225D, the lower-permeability unit below the fill is coarser-grained and more permeable, likely increasing the potential for downward flow of perched groundwater. • DNAPL source concluded to be historical releases at the Site. • DNAPL acts as source of dissolved-phase VOCs and SVOCs in groundwater.	BBL, 2000

Investigation	Date	Scope	Preliminary Findings/Conclusions	Reference
		collection system and performed system upgrades. • Completed evaluation of implementing DNAPL recovery IM, including a pilot scale DNAPL pumping test at R-225D. • Updated ecological and human health risk assessments.	• No perched groundwater present at southern end of the Site (well R-123). • No COPCs present in alluvial unit groundwater beneath southern end of the Site. • Perched groundwater recovery system is effective at preventing seeps to WPSC coal pits. • Continuous DNAPL recovery system IM should be operated at R-225D.	
2000 Sediment and Surface-Water Investigation	December 2000	• Completed bathymetric survey of the Site shoreline. • Collected sediment samples from 40 locations in Ohio River adjacent to the Site. • Collected sediment sample from four background locations in the Ohio River upstream from the Site. • Collected 11 background surface-water samples from Ohio River upstream from the Site. • Collected 18 surface-water samples from Ohio River adjacent to the Site and 10 downstream. • Performed benthic macroinvertebrate surve.y	• All surface-water results were either non-detect or below background or conservative risk-based screening levels, indicating that any discharges of Site groundwater do not appear to be adversely affecting Ohio River quality. • No free-phase DNAPL observed in sediment samples. • Ohio River upstream from the Site appears to have a baseline or background level of PAHs above the limits of detection. • PAH concentrations in sediment in the northern area of the Site suggest historical releases likely occurred rather than an ongoing release, as indicated by PAH hot spot area stretching from just north of the pipe bridge to the #56 dock and approximately 200 feet offshore.	BBL, 2001
2003 Sediment and Surface-Water Investigation	May-July 2003	• Completed bathymetric survey of investigation area. • Collected sediment samples from 30 locations within Ohio River adjacent to the Site.	• Refined horizontal extent of sediment hot spot area in Ohio River. • Overall, PAH concentrations in sediment appear to be decreasing with depth starting	BBL, 2004

TABLE 1
SUMMARY OF PREVIOUS INVESTIGATIONS

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

Investigation	Date	Scope	Preliminary Findings/Conclusions	Reference
		• Collected seven surface-water samples from the Ohio River within the investigation area. • Collected hydrodynamic data for the Ohio River. • Installed piezometer pair and seepage meter in the Ohio River near shore. • Completed pumping test at well R-231D to assess potential for DNAPL recovery. • Completed pumping test within perched unit recovery well RW-1 to further evaluate effectiveness of perched groundwater IM.	at approximately 4 to 5 feet bss. • Results suggest several source migration paths for PAH impacts in sediment. • Highest PAH concentrations correlate with the approximate location of the historical Outfall #3. • Sediment/alluvium within 100 feet of shore is mix of silts and fine- to coarse-grained sand from a few feet to 8 feet thick, underlain by coarse-grained sands, gravels, and small cobbles. The fine-grained interval pinches out with distance from shore, disappearing completely between 150 to 200 feet from shore. • DNAPL recovered from R-231D may be from same source as R-225D.	
2007 CMS Pre-Design Investigation	October-November 2007	• Collected sediment samples from 12 locations in the Ohio River near the barge dock to better assess geotechnical properties, DNAPL saturation, and vertical distribution of PAHs in sediments.	• PAH concentrations in sediments are consistent with those observed during previous investigations. • PAH concentrations and observations of DNAPL decreased with depth in the sediments. • Extent of DNAPL delineated visually at 4 to 10 feet below river bottom, except within most-impacted unit near former Outfall #3. Extent of visible DNAPL near former Outfall #3 is approximately 22 feet bss. • DNAPL in Ohio River sediments off shore from the Site is residual and, therefore, not mobile, and is not expected to migrate upward and discharge to surface water.	ARCADIS, 2008

TABLE 1
SUMMARY OF PREVIOUS INVESTIGATIONS

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

Notes:
References are provided in Section 7 of the Corrective Measures Study (CMS) Report.
AOCs = areas of concern
BBL = Blasland, Bouck & Lee
bss = below sediment surface
COPCs = constituents of potential concern
DNAPL = dense non-aqueous phase liquid
IM = interim measure
PAHs = polycyclic aromatic hydrocarbons
RCRA = Resource and Conservation Recovery Act
RFI = RCRA Facility Investigation
SVOCs = semivolatile organic compounds
SWMUs = solid waste management units
TOC = total organic carbon
VOCs = volatile organic compounds
WPSC = Wheeling-Pittsburgh Steel Corporation

TABLE 2
SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

SWMU/AOC	Description	SWMU/AOC-Specific Actions/Status
SWMU 1	**Temporary Soil Storage Piles** – Soils possibly containing phenols, creosote constituents, and naphthalene generated during roadway work and other excavation activity were historically staged in a temporary storage pile located in the vicinity of the North Tank Farm.	This pile was removed prior to the RFI (ICF Kaiser, 1996). Soil is no longer stored at this SWMU, and current Koppers policy prohibits further use of this SWMU.
SWMU 2	**Ash Slurry and Lime Slurry Storage Tanks** – These two tanks, located in the east side of the Site adjacent to the WPSC property boundary, were used to store ash slurry from the coal-fired boiler-, and a lime slurry waste from the treatment of boiler feedwater.	The production and storage of ash slurry stopped in 1988, and the ash slurry tank is currently used to store lime slurry only.
SWMU 3	**Ash/Lime Storage Pile** – Dewatered ash and lime slurries were historically stored in a pile at the north end of the Site.	The amount of ash and lime stored in the pile and/or used as sorbing material is unknown. No ash or lime slurries are currently stored here.
SWMU 4	**Lime Reject Pit** – Rejected solids from the Site limestone calcining kiln were historically stored in this shallow pit located on in the west-central portion of the Site, east of the barge dock, prior to removal for off-sSite disposal.	The area was excavated in 1985 to a depth of over 10 feet and a stormwater collection sump was installed in its place.
SWMU 5	**Pencil Pitch Storage Pile** – Rejected pitch and associated residue are stored in a pile on the concrete floor of a building located on the east side of the Site, adjacent to the WPSC property prior to off-site disposal.	The waste pencil pitch is periodically disposed in an off-Site landfill. Approximately 1,500 tons per year are collected and disposed.
SWMU 6	**Office Area Soil Storage Pile** – Between 1960 and 1982, approximately 50 cubic yards of soil impacted with coal tar distillates was placed in a stockpile adjacent to the tar distillation building near the center of the Site.	This storage pile was removed and all residues were disposed off-site when a new building foundation and concrete pad were installed at this location.
AOC 7	**Stormwater Collection Sump** – Sump used to collect stormwater constructed at the location of the former Lime Reject Pit (SWMU 4).	There is no record of AOC-specific actions taken.
AOC 8	**Wastewater Sump** – Concrete-lined sump from which rainwater and process water are pumped to the effluent treatment system.	There is no record of AOC-specific actions taken.
AOC 9	**Barge Unloading Area** – Location where crude coke oven tar and refined chemical soil are unloaded from barges are transferred via pipelines to storage tanks at the Site.	Sediment corrective action alternatives are being evaluated within the CMS. An alternative will be selected and implemented to address PAHs in sediment within and near the barge unloading area.
AOC 10	**Caustic Plant** – Located on the west side of the Site along the river, the Caustic Plant produced carbon dioxide used in the acid springers and sodium	The Caustic Plant was shutdown in 1981.

TABLE 2
SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

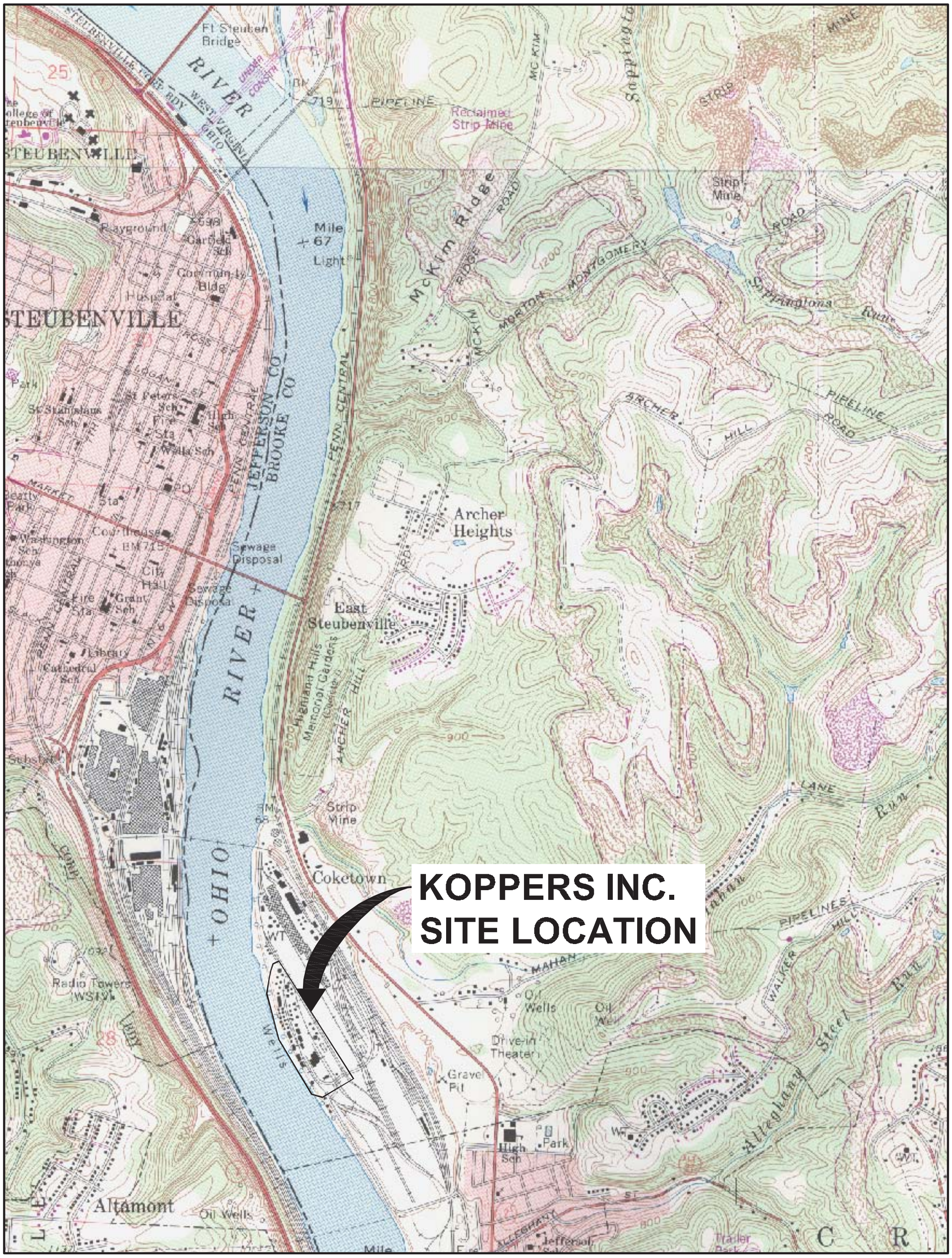
SWMU/AOC	Description	SWMU/AOC-Specific Actions/Status
	hydroxide used in the acid washers.	
AOC 11	**Main Sump** – Located between the Caustic Plant and the Acid Barreling Area, the Main Sump collects stormwater runoff from the North Tank Farm.	There is no record of AOC-specific actions taken.
AOC 12	**Tar Stills** – Located in the northeast section of the Site, the Tar Stills are the main process at the Site where crude coal tar is distilled into various fractions, including chemical oil, creosotes, and coal tar pitch.	There is no record of AOC-specific actions taken.
AOC 13	**Pitch Pans and Pencil Pitch Area** – Location where pencil pitch is stored in a covered building in the southeast area of the Site. SWMU 5 – Pencil Pitch Storage Pile, AOC 19 – Pitch Car Bottoms Pile and AOC 20 – Bone Yard are located within AOC 13.	There is no record of AOC-specific actions taken.
AOC 14	**Base Plant** – Located next to the southeast corner of the Tar Tack Loading Area, the Base Plant is where tar bases were separated from the chemical oil and creosotes produced by the tar stills producing pyridine, picoline, and quinoline.	The Base Plant was shutdown in the early 1980s.
AOC-15	**Naphthalene Desulfurization** – Location where naphthalene from the stills was desulfurized before being sent off-Site as a raw material for other manufacturing processes.	The naphthalene desulfurization process was stopped in 1984 and the process has not been dismantled.
AOC-16	**Effluent System (Primary)** – Located north of the former Synthetic Acid Plant and west of the Naphthalene Desulfurization, the Primary Effluent System includes an oil/water separator, a decanter, and a storage tank to store water a short duration before it is sent to the secondary treatment system.	There is no record of AOC-specific actions taken.
AOC-17	**Synthetic Acid Plant** – This process was located in the southwest corner of the Site. In this process, phenol was combined with methanol to produce cresols, which were further reacted with methanol to form xylenes.	The Synthetic Acid Plant was dismantled in 1985.
AOC-18	**Effluent System (Secondary)** – Located at the south end of the Site between the Synthetic Acid Plant and the Pencil Pitch Area, the Effluent System operated with two equalization tanks, two 500,000-gallon aeration basins and a clarifier.	The aeration basins were taken out of use in 1988, cleaned, filled, and capped with a concrete cap. Post-closure care and groundwater monitoring are being performed for this RCRA unit under the guidance of the 1996 Post-Closure Care Permit.
AOC-19	**Pitch Car Bottoms Pile** – Located within the AOC 13 – Pitch Pans and Pencil Pitch Area.	There is no record of AOC-specific actions taken.
AOC-20	**Bone Yard (Scrap Metal Pile)** – Located within the AOC 13 – Pitch Pans and Pencil Pitch Area. Scrap distillation columns and other scrap parts from the Site	All scrap was removed, and the present wastewater treatment plant was constructed over the

TABLE 2
SUMMARY OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

KOPPERS INC. COAL TAR PLANT
FOLLANSBEE, WEST VIRGINIA

SWMU/AOC	Description	SWMU/AOC-Specific Actions/Status
	were piled at this location in the southeast corner of the Site.	area in 1991.
AOC-21	**Acid Barreling Area** – Tar acids manufactured by the Tar Acid Plant were drummed at this location between the North Tank Farm and the Caustic Plant.	The unit was demolished and the area is now paved.
AOC-22	**North Tank Farm** – Located at the north end of the Site, this area consists of aboveground storage tanks used for storing raw material, product intermediates, finished products, and cooling water.	The North Tank Farm is now paved.
AOC-23	**Tar Track Loading Area** – Tank cars and tank trucks are loaded with finished products on this track, located along the east side of the Site.	There is no record of AOC-specific actions taken.
AOC-24	**Potential Seeps to the Ohio River** – Six seeps of perched groundwater along the east bank of the Ohio River.	These seeps are not commonly observed likely due to a combination of reduced infiltration due to additional areas being paved, improved infrastructure to reduce leakage of process water, and enhanced groundwater containment through extraction of perched groundwater via groundwater extraction wells and trenches. Continued operation of the perched groundwater extraction system is necessary under the actions stipulated in the 1984 Consent Decree.

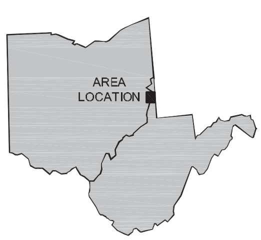
Notes:
References are provided in Section 7 of the Corrective Measures Study Report.
AOC = area of concern
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
SWMU = solid waste management unit
WPSC = Wheeling-Pittsburgh Steel Corporation



REFERENCE: BASE MAP SOURCE: USGS 7.5 MIN. TOPO. QUAD., WEIRTON, WEST VIRGINIA AND STEUBENVILLE EAST, OHIO (1968, PHOTOREVISED 1978).

0 2,400' 4,800'

GRAPHIC SCALE



QUADRANGLE LOCATION

BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

SITE LOCATION MAP

ARCADIS

FIGURE
1

NOTES:

1. BASE MAP INFORMATION TAKEN FROM DRAWINGS IN THE RCRA FACILITY INVESTIGATION REPORT PREPARED BY ICF KAISER ENGINEERS, DATED 10/21/96.
2. SITE SURVEY TAKEN FROM KEDDAL AERIAL SURVEYING MAP DEPICTED AS OF 4/7/99.

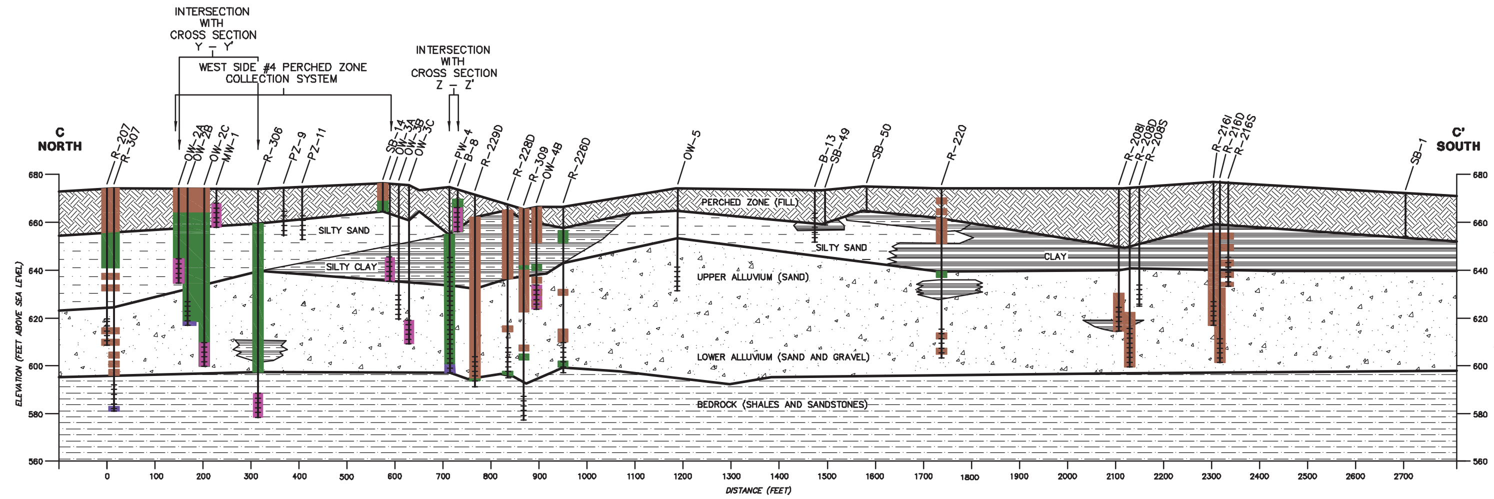
BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

SITE MAP

ARCADIS

FIGURE
2

CITY:SYR GROUP:ENV-141 DB:RCB PGL PM:H.EVANKO LYR:ON=*;OFF=REF (FRZ) ACADVER: 17.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/27/2008 2:40 PM BY: LISTER, PAUL
G:\CAD\ACT\B0039119\0000\00001\DWG\39119B01.DWG LAYOUT: 1-2 SAVED: 3/27/2008 2:40 PM
XREFS: 39119X00 IMAGES: PROJECTNAME: ----

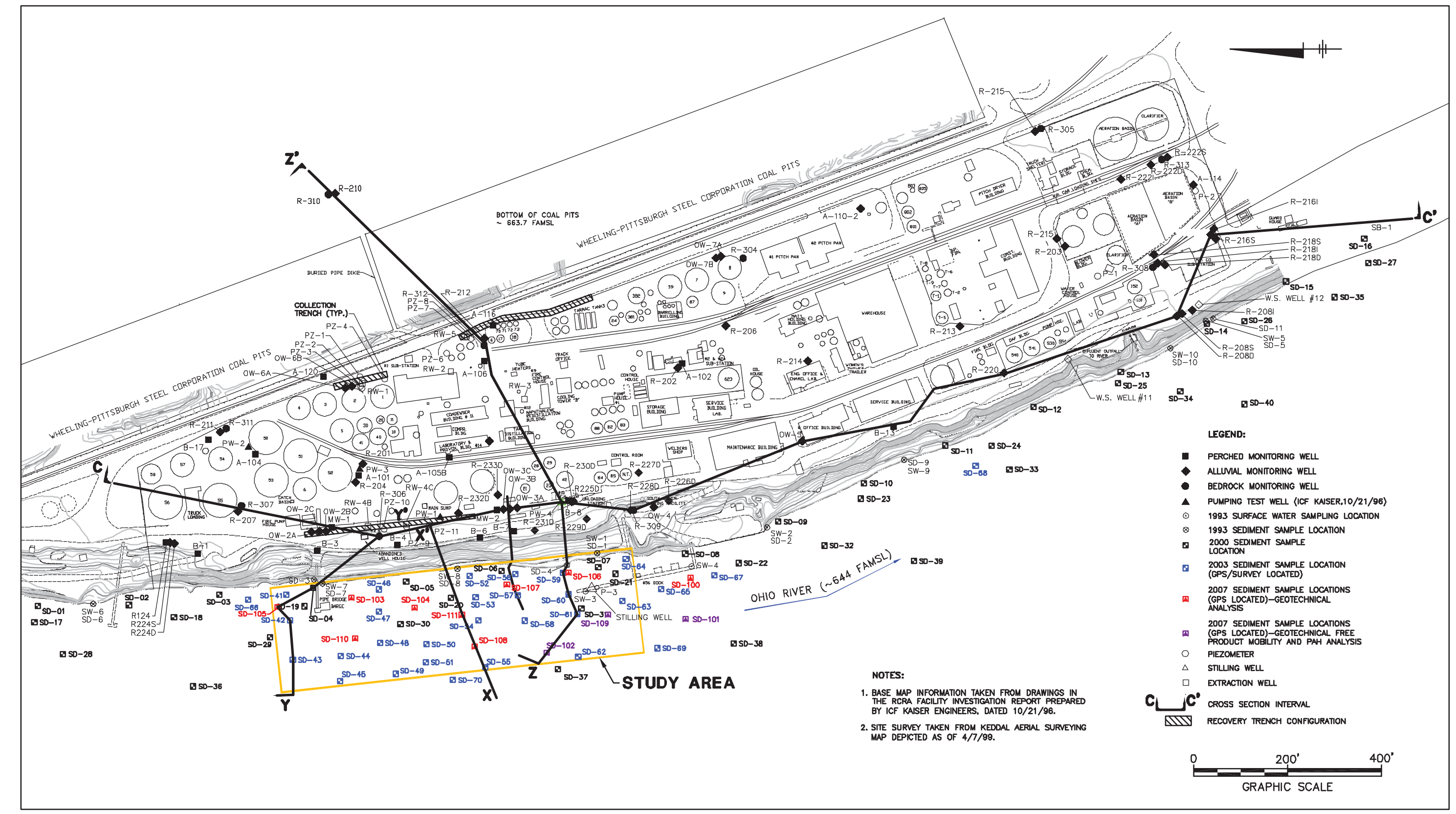


C–C' NOTES:

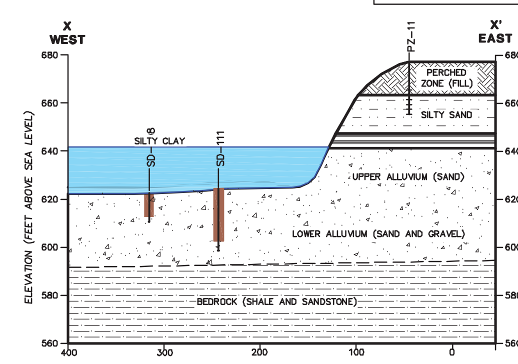
1. THE DEPTH AND THICKNESS OF SUBSURFACE STRATA INDICATED INCLUDING THOSE COMPLETED AS MONITORING WELLS ON THIS SECTION ARE GENERALIZED FROM, AND INTERPOLATED BETWEEN TEST BORINGS, INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXIST ONLY AT THE LOCATIONS OF THE TEST BORINGS IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN BORINGS MAY VARY FROM THOSE INDICATED.
2. ALL LOCATIONS APPROXIMATE, DASHED WHERE INFERRED. R–229D WAS PROJECTED ON THE CROSS–SECTION.
3. PREDOMINANT SOIL CLASSIFICATION DEPICTED BETWEEN BORINGS. CLASSIFICATION SYMBOLS MAY BE COMBINED TO DESCRIBE THE GEOLOGY.
4. NO SOIL BORING OR MONITORING WELL CONSTRUCTION LOGS WERE AVAILABLE FOR MW–1 OR B–3A; WELLS SHOWN ARE SCHEMATIC.
5. NAPL OBSERVATIONS DERIVED FROM SOIL BORING LOGS, FROM GROUNDWATER MONITORING DATA, AND FROM OBSERVATIONS OF POOLED DNAPL AS PART OF THE DNAPL RECOVERY INTERIM MEASURE MONITORING. EXTENT OF NAPL STAINING IN SOIL IS APPROXIMATE BASED ON INTERPOLATION DURING DRILLING.

0 200' 400'
APPROXIMATE HORIZONTAL SCALE
0 40' 80'
APPROXIMATE VERTICAL SCALE

CROSS SECTION C-C'



CROSS SECTION LOCATION MAP



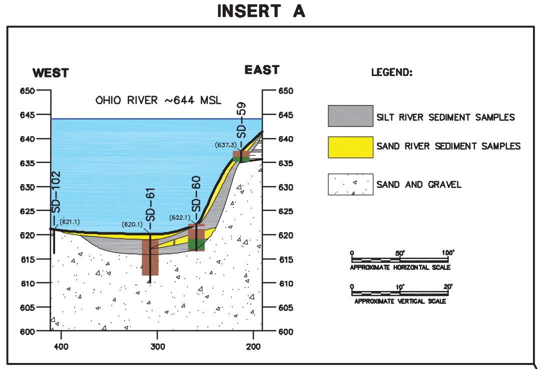
NOTES:

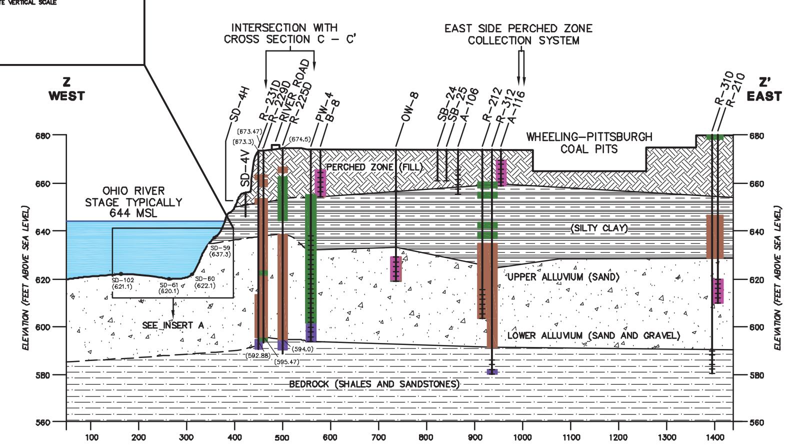
1. THE DEPTH AND THICKNESS OF SUBSURFACE STRATA INDICATED ON THIS SECTION ARE GENERALIZED FROM, AND INTERPOLATED BETWEEN SUBSURFACE BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXIST ONLY AT THE LOCATIONS OF THE SUBSURFACE BORINGS. IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN BORINGS MAY VARY FROM THOSE INDICATED.
2. ALL LOCATIONS APPROXIMATE, DASHED WHERE INFERRED
3. NAPL OBSERVATIONS DERIVED FROM SOIL BORING LOGS, AND FROM GROUNDWATER MONITORING DATA. EXTENT OF NAPL STAINING IN SOIL IS APPROXIMATE AND BASED ON INTERPOLATION DURING DRILLING.

0 100' 200'
APPROXIMATE HORIZONTAL SCALE
0 40' 80'
APPROXIMATE VERTICAL SCALE

CROSS SECTION X'-X

INSERT A





Z–Z' NOTES:

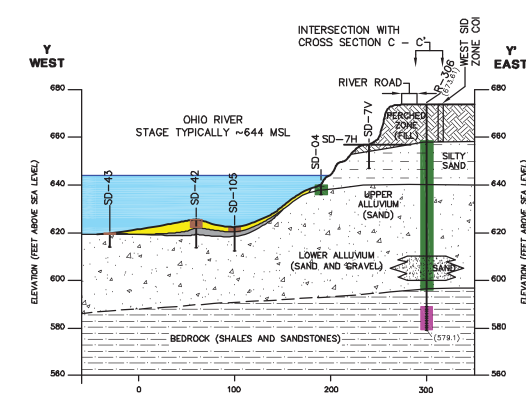
1. THE DEPTH AND THICKNESS OF SUBSURFACE STRATA INDICATED ON THIS SECTION ARE GENERALIZED FROM, AND INTERPOLATED BETWEEN SUBSURFACE BORINGS INCLUDING THOSE COMPLETED AS MONITORING WELLS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXIST ONLY AT THE LOCATIONS OF THE SUBSURFACE BORINGS. IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN BORINGS MAY VARY FROM THOSE INDICATED.
2. ALL LOCATIONS APPROXIMATE, DASHED WHERE INFERRED. R–231D, R–229D, OW–8, AND A–116 WERE PROJECTED ON THE CROSS–SECTION.
3. PREDOMINANT SOIL CLASSIFICATION DEPICTED BETWEEN BORINGS. CLASSIFICATION SYMBOLS MAY BE COMBINED TO DESCRIBE THE GEOLOGY.
4. NO SOIL BORING OR MONITORING WELL CONSTRUCTION LOGS WERE AVAILABLE FOR A–106 OR A–116; WELLS SHOWN ARE SCHEMATIC.
5. NAPL OBSERVATIONS DERIVED FROM SOIL BORING LOGS, FROM GOUNDWATER MONITORING DATA, AND FROM OBSERVATIONS OF POOLED DNAPL AS PART OF THE DNAPL RECOVERY INTERIM MEASURE MONITORING. EXTENT OF NAPL STAINING IN SOIL IS APPROXIMATE AND IS BASED ON INTERPOLATION DURING DRILLING.
6. MONITORING WELLS OW–8, A–106, A–116, AND B–8 AND SOIL BORINGS SB–24 AND SB–25 WERE ADDED TO THE ORIGINIAL RFI REPORT ICF KAISER DRAWING; NO ATTEMPT WAS MADE TO MODIFY THE STRATIGRAPHY SHOWN ON THE ORIGINAL DRAWING AROUND THESE LOCATOINS.

0 200' 400'
APPROXIMATE HORIZONTAL SCALE
0 40' 80'
APPROXIMATE VERTICAL SCALE

LEGEND:

SILT RIVER SEDIMENT SAMPLES
SAND RIVER SEDIMENT SAMPLES

CROSS SECTION Z-Z'



Y–Y' NOTES:

1. THE DEPTH AND THICKNESS OF SUBSURFACE STRATA INDICATED ON THIS SECTION ARE GENERALIZED FROM, AND INTERPOLATED BETWEEN SUBSURFACE BORINGS. INFORMATION ON ACTUAL SUBSURFACE CONDITIONS EXIST ONLY AT THE LOCATIONS OF THE SUBSURFACE BORINGS. IT IS POSSIBLE THAT SUBSURFACE CONDITIONS BETWEEN BORINGS MAY VARY FROM THOSE INDICATED.
2. ALL LOCATIONS APPROXIMATE, DASHED WHERE INFERRED.
3. NAPL OBSERVATIONS DERIVED FROM SOIL BORING LOGS, AND FROM GROUNDWATER MONITORING DATA. EXTENT OF NAPL STAINING IN SOIL IS APPROXIMATE AND BASED ON INTERPOLATION DURING DRILLING.
4. THE LOCATION OF R–306 IS PROJECTED ON THIS CROSS SECTION.

0 100' 200'
APPROXIMATE HORIZONTAL SCALE
0 40' 80'
APPROXIMATE VERTICAL SCALE

CROSS SECTION Y-Y'

GLOBAL LEGEND:

- OW–5 — BORING/WELL NUMBER
- MONITORING WELL
- SCREENED INTERVAL
- BOTTOM OF BORING
- BLACK STAINING OR OILY APPEARANCE OBSERVED IN SOIL *(POTENTIAL RESIDUAL DNAPL)*
- OILY LIQUID, TAR–LIKE SUBSTANCE, OR SHEENS IN SOIL *(POTENTIAL POOLED DNAPL)*
- DNAPL PRESENT IN MONITORING WELL *(POOLED DNAPL)*
- CONCENTRATIONS OF MOST SVOC CONSTITUENTS IN GROUNDWATER EXCEED 10% OF CALCULATED EFFECTIVE SOLUBILITIES

BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

CROSS SECTIONS

ARCADIS

FIGURE 3

CITY: SYR GROUP: ENV-141 DB: WLJ PGL PM: H. EVANKO LYR: ON=*;OFF=REF (FRZ)
G:\CAD\ACT\B0039119\0000\00001\DWG\39119V01.dwg LAYOUT: 2-1 SAVED: 3/28/2008 3:35 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/28/2008 3:35 PM BY: LISTER, PAUL
XREFS: 39119X00 IMAGES: PROJECTNAME: ----

LEGEND:

- FOLLANSBEE FACILITY PROPERTY BOUNDARY
- RAW MATERIAL STORAGE (TAR)
- CHEMICAL STORAGE AREA
- PENCIL PITCH AREA AND STORAGE
- WASTE WATER TREATMENT
- NAPTHALENE PRODUCTION AND STORAGE
- CHEMICAL OIL / ACID WASH
- TAR DISTILLATION AREA
- ACID FREE OIL STORAGE
- HDS AREA (NOT IN USE)
- ACID AND CAUSTIC STORAGE AREA

0 100' 200'
GRAPHIC SCALE

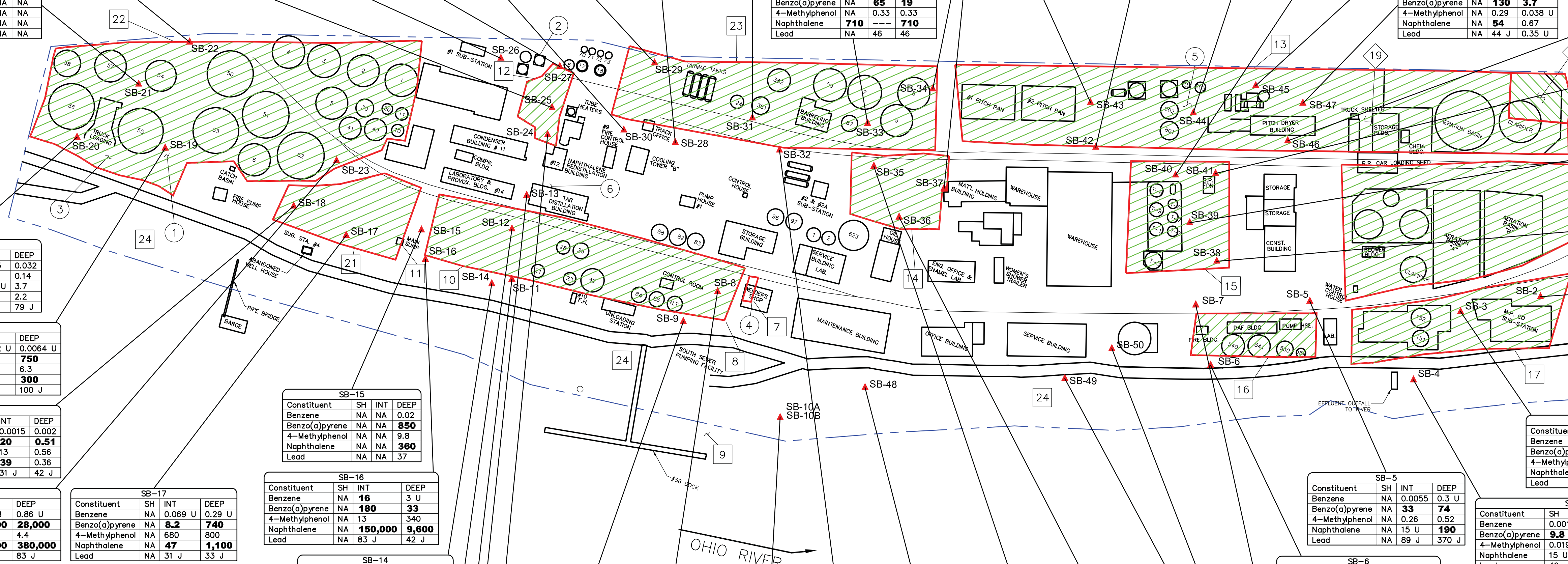
BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

FACILITY PRODUCTION, STORAGE AND TREATMENT AREAS

ARCADIS

FIGURE
4

CITY:SYR GROUP:ENV-141 DB:RCB PGL PM:H.EVANKO LYR:ON=*;OFF=REF (FRZ)
G:\CAD\ACT\B0039119\0000\00001\DWG\39119C06.DWG LAYOUT: 1-3 SAVED: 3/27/2008 2:38 PM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 3/27/2008 2:38 PM BY: LISTER, PAUL
XREFS: 39119X01 39119X00 IMAGES: PROJECTNAME: ----



SB-25			
Constituent	SH	INT	DEEP
Benzene	0.83	0.26	0.4
Benzo(a)pyrene	**360**	**88**	**0.71**
4-Methylphenol	0.17 U	0.17 U	0.064 U
Naphthalene	**880**	**420**	3.2
Lead	35 J	22 J	0.57 U

SB-27			
Constituent	SH	INT	DEEP
Benzene	0.29	0.31	**190**
Benzo(a)pyrene	**880**	**380**	**2,300**
4-Methylphenol	0.61 U	6.1	5.7
Naphthalene	**1,300**	**1,700**	**11,000**
Lead	30 J	16 J	30 J

SB-29			
Constituent	SH	INT	DEEP
Benzene	NA	2.2	0.37
Benzo(a)pyrene	NA	**230**	**74**
4-Methylphenol	NA	0.32 U	0.06 U
Naphthalene	NA	**130**	**72**
Lead	NA	7.8 J	0.36 U

SB-31			
Constituent	SH	INT	DEEP
Benzene	NA	3.4	2.4
Benzo(a)pyrene	NA	**160**	**120**
4-Methylphenol	NA	2 U	11 U
Naphthalene	NA	**30,000**	**83,000**
Lead	NA	28	13

SB-37			
Constituent	SH	INT	DEEP
Benzene	NA	0.010	0.012
Benzo(a)pyrene	NA	**540**	**120**
4-Methylphenol	NA	0.1	0.17 U
Naphthalene	NA	8.2	16 U
Lead	NA	56 J	92 J

SB-43			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.14 U	0.28 U
Benzo(a)pyrene	**930**	**650**	**2,800**
4-Methylphenol	1.9 U	0.19 U	1.9 U
Naphthalene	**33**	**75**	**220 J**
Lead	53	51	46

SB-44			
Constituent	SH	INT	DEEP
Benzene	0.0052	0.0025	0.0043
Benzo(a)pyrene	**25**	**23**	**5.4**
4-Methylphenol	0.018 U	0.045	0.018 U
Naphthalene	3.9	4.4	7.8 U
Lead	62 J	87 J	150 J

SB-40			
Constituent	SH	INT	DEEP
Benzene	0.14 U	0.14 U	0.28
Benzo(a)pyrene	**100**	**64**	**40**
4-Methylphenol	0.09 U	0.18 U	0.019 U
Naphthalene	**110**	**34**	**21**
Lead	440 J	150 J	240 J

SB-22			
Constituent	SH	INT	DEEP
Benzene	NA	0.0057 U	0.15 U
Benzo(a)pyrene	NA	**270**	**680**
4-Methylphenol	NA	1.1	44
Naphthalene	NA	17	**4,300**
Lead	NA	250 J	68 J

SB-26			
Constituent	SH	INT	DEEP
Benzene	0.0061 U	0.0059 U	0.030
Benzo(a)pyrene	**870**	**360**	**120**
4-Methylphenol	0.52	0.39 U	0.097
Naphthalene	**540**	**170**	71 U
Lead	30 J	32 J	32 J

SB-30			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.012	NA
Benzo(a)pyrene	**480**	**18**	NA
4-Methylphenol	0.94 U	0.23 U	NA
Naphthalene	**54**	19 U	NA
Lead	48	49	NA

SB-28			
Constituent	SH	INT	DEEP
Benzene	**26**	36 U	**240**
Benzo(a)pyrene	**18**	**39**	**8.1**
4-Methylphenol	0.55	9.6	7.2
Naphthalene	**990**	**1,600**	**2,300**
Lead	240 J	120 J	38 J

SB-34			
Constituent	SH	INT	DEEP
Benzene	0.0022	0.0011 U	0.0021
Benzo(a)pyrene	**700**	**14**	**4.6**
4-Methylphenol	2.3	0.09 U	0.019 U
Naphthalene	**610**	15 U	6.4 U
Lead	94	87 J	110

SB-42			
Constituent	SH	INT	DEEP
Benzene	0.0012 U	0.002 B	0.0012 U
Benzo(a)pyrene	**1,100**	**200**	**0.61**
4-Methylphenol	2 U	0.2 U	0.019 U
Naphthalene	**43**	33 U	0.31 U
Lead	47	150	31

SB-45			
Constituent	SH	INT	DEEP
Benzene	0.34	0.0078	0.0082
Benzo(a)pyrene	**820**	**130**	**220**
4-Methylphenol	0.17 U	0.038 U	0.17 U
Naphthalene	**160**	16	**36**
Lead	41 J	46 J	35 J

SB-33			
Constituent	SH	INT	DEEP
Benzene	NA	---	0.074 U
Benzo(a)pyrene	NA	**65**	**19**
4-Methylphenol	NA	0.33	0.33
Naphthalene	**710**	---	**710**
Lead	NA	46	46

SB-47			
Constituent	SH	INT	DEEP
Benzene	NA	0.015	0.0029
Benzo(a)pyrene	NA	**130**	**3.7**
4-Methylphenol	NA	0.29	0.038 U
Naphthalene	NA	**54**	0.67
Lead	NA	44 J	0.35 U

SB-46			
Constituent	SH	INT	DEEP
Benzene	NA	0.011	0.0013
Benzo(a)pyrene	NA	**69**	**16**
4-Methylphenol	NA	0.88	0.035 U
Naphthalene	NA	**49**	7.7 U
Lead	NA	64 J	41 J

SB-41			
Constituent	SH	INT	DEEP
Benzene	0.076 U	0.0058 U	0.0021
Benzo(a)pyrene	**300**	**170**	**1.2**
4-Methylphenol	0.2 U	0.19 U	0.019 U
Naphthalene	170 U	**38**	0.58
Lead	85 J	120 J	82 J

SB-39			
Constituent	SH	INT	DEEP
Benzene	28 U	1.4 U	**580**
Benzo(a)pyrene	**120**	**150**	**50**
4-Methylphenol	1.0	1.1	0.36
Naphthalene	**1,700**	**1,600**	**220**
Lead	110 J	95 J	500 J

SB-38			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.0013 U	0.0013 U
Benzo(a)pyrene	**220**	**39**	**650**
4-Methylphenol	0.89	0.22 U	0.22 U
Naphthalene	31 U	35 U	**93**
Lead	71	73	41

SB-2			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.003 B	0.0017
Benzo(a)pyrene	NA	**10**	**0.89**
4-Methylphenol	0.190 U	0.11 U	0.019 U
Naphthalene	30 U	17 U	0.2 J
Lead	100	230	170

SB-21			
Constituent	SH	INT	DEEP
Benzene	0.067 U	NA	NA
Benzo(a)pyrene	**26**	NA	NA
4-Methylphenol	0.58	NA	NA
Naphthalene	**150**	NA	NA
Lead	84 J	NA	NA

SB-20			
Constituent	SH	INT	DEEP
Benzene	NA	0.0013	0.032
Benzo(a)pyrene	NA	**1.1**	0.14
4-Methylphenol	NA	0.018 U	3.7
Naphthalene	NA	3.9	2.2
Lead	NA	67 J	79 J

SB-19			
Constituent	SH	INT	DEEP
Benzene	NA	0.0012 U	0.0064 U
Benzo(a)pyrene	NA	**17**	**750**
4-Methylphenol	NA	0.2 U	6.3
Naphthalene	NA	16	**300**
Lead	NA	6.1 J	100 J

SB-18			
Constituent	SH	INT	DEEP
Benzene	NA	0.0015	0.002
Benzo(a)pyrene	NA	**20**	**0.51**
4-Methylphenol	NA	13	0.56
Naphthalene	NA	**39**	0.36
Lead	NA	31 J	42 J

SB-23			
Constituent	SH	INT	DEEP
Benzene	NA	0.008	0.86 U
Benzo(a)pyrene	NA	**4,300**	**28,000**
4-Methylphenol	NA	0.43	4.4
Naphthalene	NA	**1,200**	**380,000**
Lead	NA	91 J	83 J

SB-17			
Constituent	SH	INT	DEEP
Benzene	NA	0.069 U	0.29 U
Benzo(a)pyrene	NA	**8.2**	**740**
4-Methylphenol	NA	680	800
Naphthalene	NA	**47**	**1,100**
Lead	NA	31 J	33 J

SB-15			
Constituent	SH	INT	DEEP
Benzene	NA	NA	0.02
Benzo(a)pyrene	NA	NA	**850**
4-Methylphenol	NA	NA	9.8
Naphthalene	NA	NA	**360**
Lead	NA	NA	37

SB-16			
Constituent	SH	INT	DEEP
Benzene	NA	**16**	3 U
Benzo(a)pyrene	NA	**180**	**33**
4-Methylphenol	NA	13	340
Naphthalene	NA	**150,000**	**9,600**
Lead	NA	83 J	42 J

SB-14			
Constituent	SH	INT	DEEP
Benzene	NA	3 U	1.5 U
Benzo(a)pyrene	NA	**180**	**130**
4-Methylphenol	NA	27	13
Naphthalene	NA	**7,200**	**200**
Lead	NA	86 J	86 J

SB-12			
Constituent	SH	INT	DEEP
Benzene	NA	3.5	1.6 U
Benzo(a)pyrene	NA	**68**	**150**
4-Methylphenol	NA	400	710
Naphthalene	NA	**1,600**	**7,900**
Lead	NA	240	320

SB-8			
Constituent	SH	INT	DEEP
Benzene	NA	0.0013 U	0.0012 U
Benzo(a)pyrene	NA	**700**	**1,000**
4-Methylphenol	NA	14	9.5
Naphthalene	NA	**78**	34 U
Lead	NA	680	520

SB-35			
Constituent	SH	INT	DEEP
Benzene	NA	0.0098	0.0067
Benzo(a)pyrene	NA	**590**	**27**
4-Methylphenol	NA	5.3	0.22
Naphthalene	NA	**280**	8.2 U
Lead	NA	20 J	52 J

SB-7			
Constituent	SH	INT	DEEP
Benzene	NA	0.0011	0.67 U
Benzo(a)pyrene	NA	**260**	**200**
4-Methylphenol	NA	0.480	620
Naphthalene	NA	**53**	**57,000**
Lead	NA	30 J	**870 J**

SB-6			
Constituent	SH	INT	DEEP
Benzene	NA	0.0012	0.0026
Benzo(a)pyrene	NA	**13**	**18**
4-Methylphenol	NA	0.019	0.019 U
Naphthalene	NA	**32**	**60**
Lead	NA	70 J	120 J

SB-5			
Constituent	SH	INT	DEEP
Benzene	NA	0.0055	0.3 U
Benzo(a)pyrene	NA	**33**	**74**
4-Methylphenol	NA	0.26	0.52
Naphthalene	NA	15 U	**190**
Lead	NA	89 J	370 J

SB-4			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.0011 U	0.0012 U
Benzo(a)pyrene	**9.8**	**20**	**24**
4-Methylphenol	0.019 U	0.13	0.078
Naphthalene	15 U	15 U	17 U
Lead	49	47	360

SB-3			
Constituent	SH	INT	DEEP
Benzene	0.0025 U	0.0021	0.0019
Benzo(a)pyrene	**14**	**0.45**	**1.0**
4-Methylphenol	0.037	0.018 U	0.018 U
Naphthalene	7.2	0.55	1.2
Lead	54 J	54 J	59 J

SB-1			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.0012 U	NA
Benzo(a)pyrene	**190**	**110**	NA
4-Methylphenol	0.052	0.049	NA
Naphthalene	**38**	**22**	NA
Lead	110	150	NA

Region 3 – Industrial Soil RBCs	
Benzene	5.6
Benzo(a)pyrene	0.21
4-Methylphenol	3,100
Naphthalene	20
Lead	800

SB-11			
Constituent	SH	INT	DEEP
Benzene	NA	NA	0.0011 U
Benzo(a)pyrene	NA	NA	0.12
4-Methylphenol	NA	NA	0.019 U
Naphthalene	NA	NA	0.3 U
Lead	NA	NA	160

SB-9			
Constituent	SH	INT	DEEP
Benzene	NA	3.8	**8.9**
Benzo(a)pyrene	NA	**50**	**35**
4-Methylphenol	NA	2.1	0.18 U
Naphthalene	NA	**84**	**77**
Lead	NA	57 J	35 J

SB-10A			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	NA	NA
Benzo(a)pyrene	NA	NA	NA
4-Methylphenol	NA	NA	NA
Naphthalene	16 U	16 U	3.2 U
Lead	130	NA	NA

SB-48			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.0019 B	0.0011 U
Benzo(a)pyrene	**64**	**2.4**	**1.0**
4-Methylphenol	0.19 U	0.019 U	0.019 U
Naphthalene	31 U	6.3 U	1.0
Lead	150	140	96

SB-36			
Constituent	SH	INT	DEEP
Benzene	NA	0.14 U	0.3
Benzo(a)pyrene	NA	**2,400**	**2,600**
4-Methylphenol	NA	47	350
Naphthalene	NA	**1,300**	**1,000**
Lead	NA	21 J	26 J

SB-50			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.210	0.0012 U
Benzo(a)pyrene	**150**	**0.21**	**1.9**
4-Methylphenol	0.18 U	0.019 U	0.021 U
Naphthalene	30 U	--*	0.32 U
Lead	180	5.9	270

SB-13			
Constituent	SH	INT	DEEP
Benzene	2.6	0.43	**7.6**
Benzo(a)pyrene	**54**	**140**	**19**
4-Methylphenol	0.51	1.1	1.7
Naphthalene	**550**	**200**	**180**
Lead	33 J	43 J	11

SB-24			
Constituent	SH	INT	DEEP
Benzene	**7.7**	1.9	**360**
Benzo(a)pyrene	**160**	**94**	**760**
4-Methylphenol	0.17 U	0.037 U	3.5
Naphthalene	**550**	**250**	**4,800**
Lead	23 J	20 J	90 J

SB-10B			
Constituent	SH	INT	DEEP
Benzene	NA	0.0017	0.0012 U
Benzo(a)pyrene	**77**	**17**	**1.7**
4-Methylphenol	0.170	0.12	0.061
Naphthalene	16 U	16 U	3.2 U
Lead	NA	120	27

SB-32			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.017	0.28 U
Benzo(a)pyrene	**990**	**85**	**14**
4-Methylphenol	0.15	0.2 U	0.095 U
Naphthalene	31 U	33 U	NA
Lead	91	22	52

SB-49			
Constituent	SH	INT	DEEP
Benzene	0.0011 U	0.0012 U	0.0014 U
Benzo(a)pyrene	**150**	**130**	**8.4**
4-Methylphenol	0.19	0.104 U	0.069
Naphthalene	**93**	**270**	5.2
Lead	60	31	190

LEGEND:

SOIL BORING LOCATION

LOCATION OF SWMU

11 OR 13 LOCATION OF AREA OF CONCERN

LOCATION OF AREA OF CONCERN WITHIN LARGER AREA OF CONCERN

APPROXIMATE PLANT PROPERTY LINE

NOTES:

1. ALL RESULTS ARE PRESENTED IN MILLIGRAMS PER KILOGRAM (mg/kg).
2. BOLD RESULTS ARE GREATER THAN USEPA REGION 3 INDUSTRIAL SOIL RBCS.
3. SOIL SAMPLE INTERVALS INDICATE AN APPROXIMATE DEPTH RANGE THAT VARIES BY LOCATION.

ABBREVIATIONS:
RBCS - RISK-BASED CONCENTRATIONS
SH - SHALLOW INTERVAL (0-1 ft. bgs)
INT - INTERMEDIATE INTERVAL (2-4 ft. bgs)
DEEP - DEEP INTERVAL (4.5-16.5 ft. bgs)
--- - DATA NOT AVAILABLE
B - ANALYTE DETECTED IN ASSOCIATED BLANK
J - ESTIMATED RESULT
U - NOT DETECTED AT LIMIT SPECIFIED
NA - NOT ANALYZED
ft. bgs - FEET BELOW GROUND SURFACE

0 100' 200'
GRAPHIC SCALE

SWMU'S

1 TEMPORARY SOIL STORAGE PILES
2 ASH SLURRY AND LIME SLURRY STORAGE TANKS
3 ASH / LIME STORAGE PILE
4 LIME REJECT PIT
5 PENCIL PITCH STORAGE PILE
6 OFFICE AREA SOIL STORAGE PILE

AOC'S

7 STORM WATER COLLECTION SUMP
8 WASTEWATER SUMP
9 BARGE UNLOADING AREA
10 CAUSTIC PLANT
11 MAIN SUMP
12 TAR STILLS
13 PITCH PANS AND PENCIL PITCH AREA
19 PITCH CAR BOTTOMS PILE
20 BONE YARD (SCRAP METAL PILE)
14 BASE PLANT
15 NAPHTHALENE DESULFURIZATION
16 EFFLUENT SYSTEM (PRIMARY)
17 SYNTHETIC ACID PLANT
18 EFFLUENT SYSTEM (SECONDARY)
21 ACID BARRELING
22 NORTH TANK FARM
23 TAR TRUCK LOADING AREA
24 SIX AREAS OF POTENTIAL SEEPS TO THE OHIO RIVER
NOTE: FOR THIS AOC, ONLY 3 OF THE 6 SEEPS WERE IDENTIFIABLE DURING THE RFI FIELD INVESTIGATION.

BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

POTENTIAL SOURCE AREAS AND SUMMARY OF INDICATOR COCs IN SOIL

ARCADIS

FIGURE 5

LEGEND:

STILLING WELL	2007 STILLING WELL
MW-B-03	2003 MONITORING WELL LOCATION (BBL SURVEY)
OW-02B	2003 OBSERVATION WELL LOCATION (BBL SURVEY)
RW-4C	RECOVERY WELL LOCATION
R225D	DNAPL RECOVERY WELL LOCATION
PZ-01	PIEZOMETER
A-104	PERCHED MONITORING WELL
OW-5/R-231D	ALLUVIAL MONITORING WELL
R-311	BEDROCK MONITORING WELL
PW-4	PUMPING TEST WELL (ICF KAISER, 10/21/96)
	APPROXIMATE SHORELINE
	APPROXIMATE PLANT PROPERTY LINE
	TOPOGRAPHIC CONTOUR
	DEPTH-TO-BOTTOM CONTOUR
	RECOVERY TRENCH CONFIGURATION
598	TOP OF BEDROCK CONTOUR

OBSERVED DNAPL KEY:

- DNAPL PRESENT IN MONITORING WELL (POOLED DNAPL)
- WELLS THAT CONTAINED MEASURABLE DNAPL HISTORICALLY, BUT DO NOT CURRENTLY
- BLACK STAINING OR OILY APPEARANCE OBSERVED IN SOIL (POTENTIAL RESIDUAL DNAPL)

0 60' 120'
GRAPHIC SCALE

NOTES:

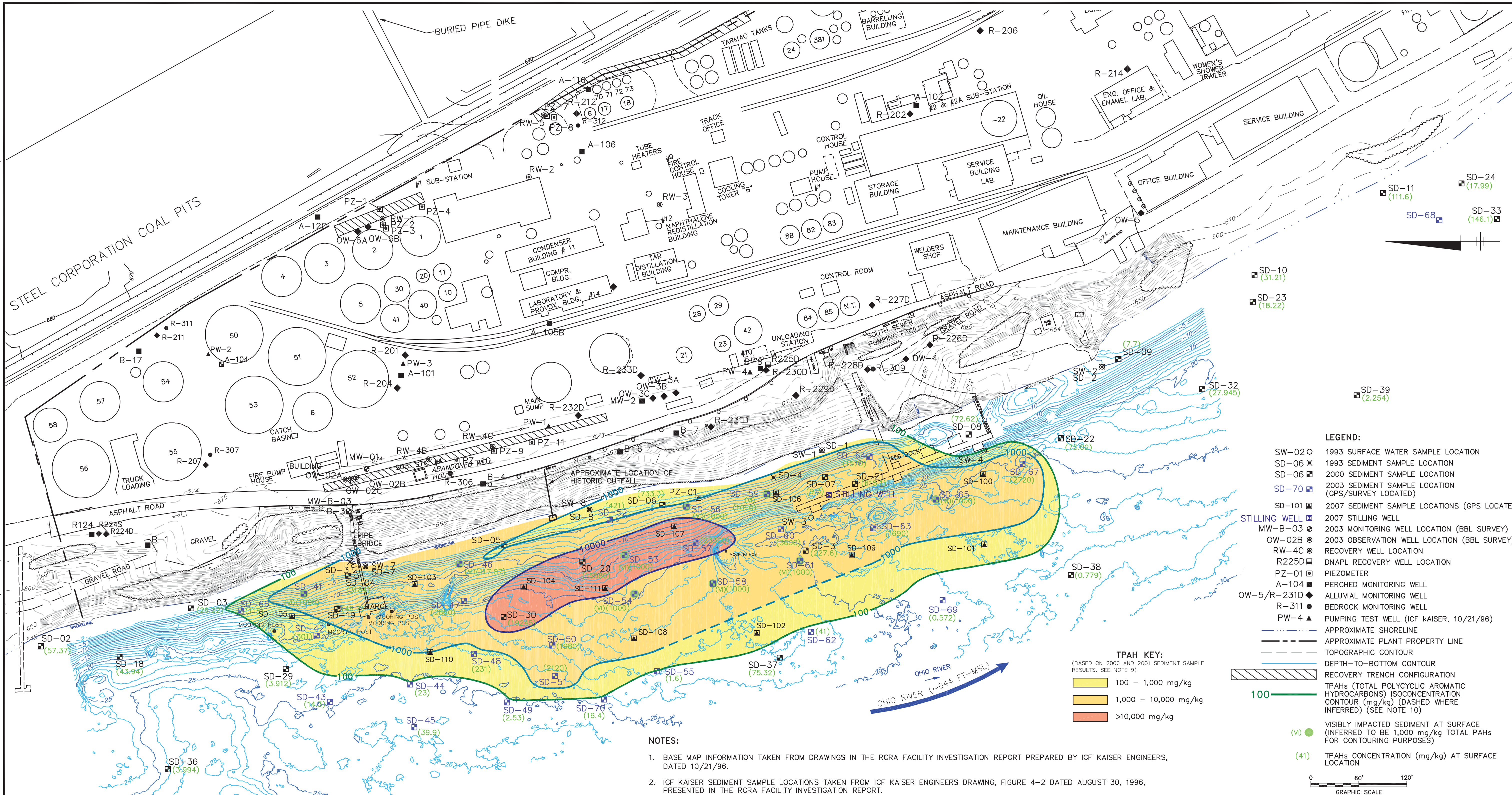
1. BASE MAP INFORMATION TAKEN FROM DRAWINGS IN THE RCRA FACILITY INVESTIGATION REPORT PREPARED BY ICF KAISER ENGINEERS, DATED 10/21/96.
2. ICF KAISER SEDIMENT SAMPLE LOCATIONS TAKEN FROM ICF KAISER ENGINEERS DRAWING, FIGURE 4-2 DATED AUGUST 30, 1996, PRESENTED IN THE RCRA FACILITY INVESTIGATION REPORT.
3. BASEMAP AND SAMPLES PRIOR TO 2003 ADJUSTED TO WEST VIRGINIA NORTH ZONE COORDINATES. 2003 SEDIMENT SAMPLE AND WELL LOCATIONS BY BBL ARE WEST VIRGINIA NORTH ZONE COORDINATES.
4. SEDIMENT SAMPLES SD-45, SD-48, SD-49, SD-51, AND SD-69 WERE ADJUSTED FROM THEIR GPS READINGS TO ALIGN WITH PHYSICAL DISTANCE MEASUREMENTS TAKEN FROM FIXED POINTS OF REFERENCE DUE TO INSTRUMENT INTERFERENCES.
5. GRID SYSTEM IS IN FEET AND IS THE WEST VIRGINIA NORTH STATE PLANE COORDINATE SYSTEM, NAD83.
6. SHORELINE AND ONSHORE FEATURES ARE APPROXIMATE.
7. THE BATHYMETRIC INFORMATION PRESENTED ON THIS DRAWING REPRESENTS THE RESULTS OF A MULTIBEAM SURVEY PERFORMED BY OCEAN SURVEYS, INC. DRAWING 07ES005.DWG, DATED JANUARY 23-24, 2007. DEPTH-TO-BOTTOM MEASUREMENTS WERE CALCULATED BY SUBTRACTING BATHYMETRIC ELEVATIONS FROM THE AVERAGE WATER SURFACE ELEVATION (645 FT AMSL) MEASURED ON JANUARY 23, 2007.
8. THE LAND SURVEY WAS PERFORMED BY MORRIS KNOWLES ASSOCIATES, INC. ON JANUARY 22-24, 2007.

BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

LOCATIONS OF OBSERVED DNAPL IN UPLANDS

ARCADIS

FIGURE
6



NOTES:

1. BASE MAP INFORMATION TAKEN FROM DRAWINGS IN THE RCRA FACILITY INVESTIGATION REPORT PREPARED BY ICF KAISER ENGINEERS, DATED 10/21/96.
2. ICF KAISER SEDIMENT SAMPLE LOCATIONS TAKEN FROM ICF KAISER ENGINEERS DRAWING, FIGURE 4-2 DATED AUGUST 30, 1996, PRESENTED IN THE RCRA FACILITY INVESTIGATION REPORT.
3. BASEMAP AND SAMPLES PRIOR TO 2003 ADJUSTED TO WEST VIRGINIA NORTH ZONE COORDINATES. 2003 SEDIMENT SAMPLE AND WELL LOCATIONS BY BBL ARE WEST VIRGINIA NORTH ZONE COORDINATES.
4. SEDIMENT SAMPLES SD-45, SD-48, SD-49, SD-51, AND SD-69 WERE ADJUSTED FROM THEIR GPS READINGS TO ALIGN WITH PHYSICAL DISTANCE MEASUREMENTS TAKEN FROM FIXED POINTS OF REFERENCE DUE TO INSTRUMENT INTERFERENCES.
5. GRID SYSTEM IS IN FEET AND IS THE WEST VIRGINIA NORTH STATE PLANE COORDINATE SYSTEM, NAD83.
6. SHORELINE AND ONSHORE FEATURES ARE APPROXIMATE.
7. THE BATHYMETRIC INFORMATION PRESENTED ON THIS DRAWING REPRESENTS THE RESULTS OF A MULTIBEAM SURVEY PERFORMED BY OCEAN SURVEYS, INC. DRAWING 07ES005.DWG, DATED JANUARY 23–24, 2007. DEPTH-TO-BOTTOM MEASUREMENTS WERE CALCULATED BY SUBTRACTING BATHYMETRIC ELEVATIONS FROM THE AVERAGE WATER SURFACE ELEVATION (645 FT AMSL) MEASURED ON JANUARY 23, 2007.
8. THE LAND SURVEY WAS PERFORMED BY MORRIS KNOWLES ASSOCIATES, INC. ON JANUARY 22–24, 2007.
9. TPAH ISOCONCENTRATION CONTOURS DEPICTED ARE BASED ON THE SURFICIAL SEDIMENT SAMPLES COLLECTED FROM THE 0 TO 1 FOOT INTERVAL DURING THE 2000 AND 2003 SEDIMENT INVESTIGATIONS.

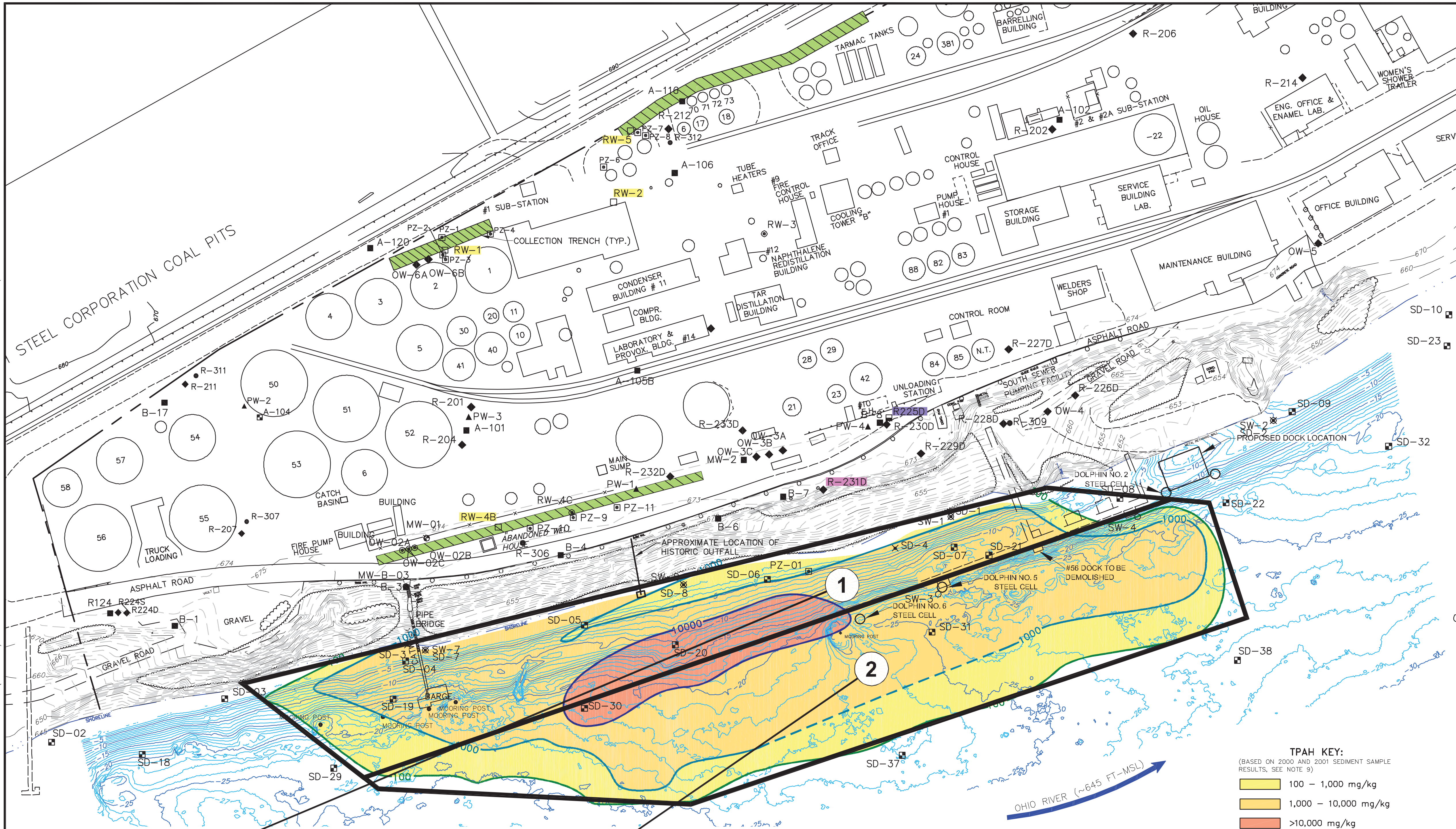
BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

PAH ISOCONCENTRATIONS IN SEDIMENT

ARCADIS

FIGURE 7

CITY: SYR GROUP: ENV-141 DB: RCB PGL PM: H. EVANKO LYR: ON=*;OFF=REF (FRZ)
G:\CAD\ACT\B0039119\0000\00001\DWG\39119B17.DWG LAYOUT: 24 SAVED: 3/28/2008 11:37 AM ACADVER: 17.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: DEFAULT R14 PEN ASSIGNMENTS.CTB PLOTTED: 3/28/2008 11:37 AM BY: LISTER, PAUL
XREFS: 39086X02 39119X00 IMAGES: PROJECTNAME: ----



LEGEND:

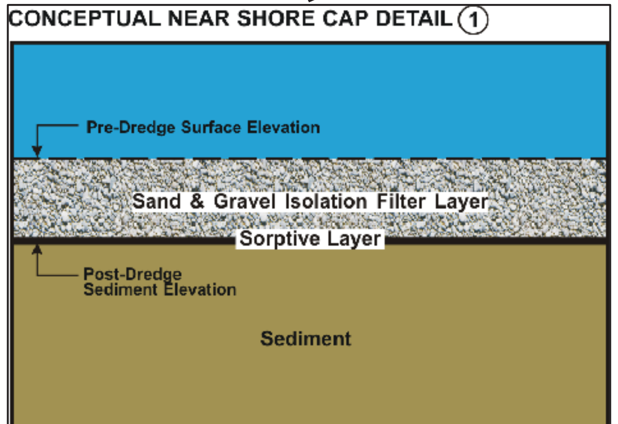
- APPROXIMATE SHORELINE
- APPROXIMATE PLANT PROPERTY LINE
- TOPOGRAPHIC CONTOUR
- DEPTH–TO–BOTTOM CONTOUR
- RECOVERY TRENCH CONFIGURATION
- 100 TPAHs (TOTAL POLYCYCLIC AROMATIC HYDROCARBONS) ISOCONCENTRATION CONTOUR (mg/kg) (DASHED WHERE INFERRED) (TYPICAL)
- STILLING WELL 2007 STILLING WELL
- MW–B–03 2003 MONITORING WELL LOCATION (BBL SURVEY)
- OW–02B 2003 OBSERVATION WELL LOCATION (BBL SURVEY)
- RW–4B RECOVERY WELL LOCATION
- R225D DNAPL RECOVERY WELL LOCATION
- PZ–01 PIEZOMETER
- A–104 PERCHED MONITORING WELL
- OW–5/R–231D ALLUVIAL MONITORING WELL
- R–311 BEDROCK MONITORING WELL
- PW–4 PUMPING TEST WELL (ICF kAISER, 10/21/96)
- TOPOGRAPHIC CONTOUR
- R–231D NEW DNAPL RECOVERY WELL LOCATION
- SD–39 SEDIMENT SAMPLE LOCATION
- APPROXIMATE EXTENT OF CAP

REMEDIAL COMPONENT:

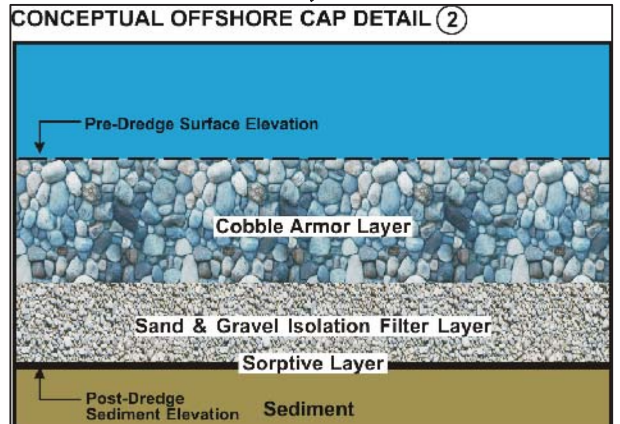
1. DREDGE ~1 FOOT AND NEAR SHORE CAP
2. DREDGE ~3 FEET AND OFFSHORE CAP

0 60' 120'
GRAPHIC SCALE

CONCEPTUAL NEAR SHORE CAP DETAIL 1



CONCEPTUAL OFFSHORE CAP DETAIL 2



NOTES:

1. BASE MAP INFORMATION TAKEN FROM DRAWINGS IN THE RCRA FACILITY INVESTIGATION REPORT PREPARED BY ICF KAISER ENGINEERS, DATED 10/21/96.
2. ICF KAISER SEDIMENT SAMPLE LOCATIONS TAKEN FROM ICF KAISER ENGINEERS DRAWING, FIGURE 4–2 DATED AUGUST 30, 1996, PRESENTED IN THE RCRA FACILITY INVESTIGATION REPORT.
3. BASEMAP AND SAMPLES PRIOR TO 2003 ADJUSTED TO WEST VIRGINIA NORTH ZONE COORDINATES. 2003 SEDIMENT SAMPLE AND WELL LOCATIONS BY BBL ARE WEST VIRGINIA NORTH ZONE COORDINATES.
4. SEDIMENT SAMPLES SD–45, SD–48, SD–49, SD–51, AND SD–69 WERE ADJUSTED FROM THEIR GPS READINGS TO ALIGN WITH PHYSICAL DISTANCE MEASUREMENTS TAKEN FROM FIXED POINTS OF REFERENCE DUE TO INSTRUMENT INTERFERENCES.
5. GRID SYSTEM IS IN FEET AND IS THE WEST VIRGINIA NORTH STATE PLANE COORDINATE SYSTEM, NAD83.
6. SHORELINE AND ONSHORE FEATURES ARE APPROXIMATE.
7. THE BATHYMETRIC INFORMATION PRESENTED ON THIS DRAWING REPRESENTS THE RESULTS OF A MULTIBEAM SURVEY PERFORMED BY OCEAN SURVEYS, INC. DRAWING 07ES005.DWG, DATED JANUARY 23–24, 2007. DEPTH–TO–BOTTOM MEASUREMENTS WERE CALCULATED BY SUBTRACTING BATHYMETRIC ELEVATIONS FROM THE AVERAGE WATER SURFACE ELEVATION (645 FT AMSL) MEASURED ON JANUARY 23, 2007.
8. THE LAND SURVEY WAS PERFORMED BY MORRIS KNOWLES ASSOCIATES, INC. ON JANUARY 22–24, 2007.
9. TPAH ISOCONCENTRATION CONTOURS DEPICTED ARE BASED ON THE SURFICIAL SEDIMENT SAMPLES COLLECTED FROM THE 0 TO 1 FOOT INTERVAL DURING THE 2000 AND 2003 SEDIMENT INVESTIGATIONS.

BEAZER EAST, INC.
KOPPERS INC. PLANT
FOLLANSBEE, WEST VIRGINIA

SELECTED SEDIMENT AND GROUNDWATER CORRECTIVE MEASURES ALTERNATIVES

ARCADIS

FIGURE 8

ATTACHMENT A
EPA RESPONSES TO PUBLIC COMMENTS
KOPPERS INC.
FOLLANSBEE, WEST VIRGINIA

EPA held a thirty (30)-day public comment period for the public to raise any issues relating to the proposed Final Remedy for the Koppers Inc. Coal Tar Plant located to the northwest of Follansbee, Brooke County, West Virginia (Facility or Site). The public comment period began on September 10, 2010 and ended October 11, 2010. EPA received written comments during that time.

The comments received from Linda S. Paul, Koppers Inc., and EPA's Responses are set forth below:

Comment 1:

General comment – as the SB states the facility has undergone multiple ownership and name changes over the years. Koppers Inc. acknowledges that the distinction between the various "Koppers" named entities that have owned/operated the site can be confusing. However, Koppers Inc. believes identifying and maintaining this distinction is important since Beazer East, Inc. (formerly known as Koppers Company, Inc.) was issued the Administrative Order on Consent to perform the remedial activities at the site, will be implementing and maintaining the remedy, and is the permittee on the RCRA Post-Closure Care permit for the site. The SB attempts to clarify the various entities in Section II., but Koppers Inc. believes that further clarification is needed within the SB for accuracy as indicated in several of the comments below.

EPA Response:

EPA agrees with the comment and has further clarified the entities referenced in the Final Decision.

Comment 2:

Glossary, page 2 – the entry "Koppers – Koppers Industries, Inc." should be changed to "Koppers – Koppers Industries, Inc. (now Koppers Inc.) to reflect the current company name.

<u>EPA Response</u>:

EPA agrees with the comment. Given that the Final Decision in Section III, "Facility Background and History," further clarifies the entities referenced in the Final Decision, the reference to Koppers in the Glossary has been removed in the Final Decision.

<u>Comment 3</u>:

Section II. Facility Background and History, page 5 – the following revisions are suggested to further clarify the distinction between the two companies at the site:

- **In the next to last line in the 1st paragraph "Koppers Industries, Inc." should be "Koppers Inc."**
- **In the 2nd paragraph, 3rd line, after Beazer East, Inc. insert (formerly known as Koppers Company, Inc.).**
- **Modify the last sentence of the 2nd paragraph to read…. *"For convenience of reference, Koppers in this document refers to the site or facility location or the current facility owner/operator, Koppers Inc., and Beazer East refers to the responsible party of the Order to perform the work."***

<u>EPA Response</u>:

EPA agrees with the comment. EPA has incorporated the comments in the first 2 bullets in the Final Decision. With respect to the third bullet, EPA believes that it has addressed this comment by further clarifying the entities referenced in the Final Decision.

<u>Comment 4</u>:

Section III. Summary of Previous Investigations and Interim Measures, page 5 – 4th line of 1st paragraph, the reference to "Koppers interoffice correspondence dating from the mid 1950s through the late 1970s" should be changed to "company interoffice correspondence" or "Koppers Company, Inc. interoffice correspondence". As "Koppers" is defined in the SB as Koppers Industries, Inc. (now Koppers Inc., see comment # 2 above), a company which was not in existence during the referenced timeframe, use of the word "Koppers" in this context is inaccurate.

<u>EPA Response</u>:

EPA agrees with the comment and has incorporated this change in the Final Decision.

<u>Comment 5</u>:

> **Section V. Summary of Human Health Risk Assessment, B. Soil Exposure Pathways, page 15 – The second sentence of the 1st full paragraph on page 15 reads….” For potential future construction workers at the Facility, personal protective equipment will be used during construction activities as required by Koppers Health and Safety.” The plant’s health and safety plan may not be the proper location to address these activities; they are likely better addressed as part of the land use control documents to be developed for the site. Therefore, Koppers Inc. suggests this sentence should read as:**
>
> **“ For potential future construction workers at the Facility, personal protective equipment will be used during construction activities as required.”**

<u>EPA Response</u>:

> EPA agrees with the comment and has incorporated this change in the Final Decision.

<u>Comment 6</u>:

> **Section VII. Summary of Proposed Remedy, A. Scope of Remediation (1) Soil - For reasons similar to Comment # 5 above, at the end of the 2nd sentence in this paragraph, Koppers Inc. suggests replacing the phrase “Facility Health and Safety Program requirements” with “health and safety guidelines to be developed.”**

<u>EPA Response</u>:

> EPA agrees with the comment and has incorporated this change in Section VIII, “Corrective Action Objectives” of the Final Decision.

<u>Comment 7</u>:

> **Section VII. Summary of Proposed Remedy, C. Proposed Remedy, 2. Sediment – Shallow Depth Removal with Cap, Page 22, 1st full paragraph – the second to last sentence states….”The caps will be constructed to existing grade to minimize their effect on river navigation and flood control”… Koppers expresses it concurrence with this statement and requests that sediment caps be placed and maintained so as not to impede operations at its dock facility on the river.**

<u>EPA Response</u>:

> EPA agrees with the comment and has incorporated this change in the Final Decision.

<u>Comment 8</u>:

Section VII. Summary of Proposed Remedy, C. Proposed Remedy, 4. Facility Wide Non-Engineering Controls, page 24 – 2nd bullet says …" Establishment of a program to monitor future changes to Facility conditions that may alter the assumptions used in the ICs and HHRA such as change in surface cover…" Koppers Inc. acknowledges that certain site conditions such as presence of existing covers have been factored into development of the remedy. This bullet addresses monitoring of any changes in conditions used as an assumption in the remedy development. Similar to the discussion in Comment # 9 below, Koppers Inc. requests this process not be overly burdensome or restrictive of facility operations and remain flexible. The details of this monitoring can be defined in the land use control documents to be developed as part of the remedy. This [sic] **Koppers suggests the following modification to this bullet:**

"Monitoring of future changes to Facility conditions that may alter the assumptions used in the ICs and HHRA such as change in surface cover."

<u>EPA Response</u>:

EPA agrees with the comment and has incorporated this change in the Final Decision.

<u>Comment 9</u>:

Section VII Summary of Proposed Remedy, C. Proposed Remedy, 4. Facility Wide Non-Engineering Controls, page 24 – 4th bullet says …."Maintenance of all paved areas and/or building footprints to minimize surface water infiltration…" As the current facility owner, Koppers is very concerned that this statement implies that existing footprints for buildings or paved areas cannot change over time. Such a requirement would place an undue restriction on plant operations. Koppers reserves the right to change the facility configuration as necessary to support facility operations. The statement seems directed to ensuring surface covers are maintained in the designated areas to limit direct contact with COCs and minimize surface infiltration. To this end, these covers need not be the existing covers as configurations may change in the future, but some type of cover replaced or maintained by Beazer as needed to meet the stated objectives. To avoid possible future confusion regarding Koppers Inc.'s ability to make site modifications, Koppers Inc. suggests the following modification to this bullet:

"Maintenance of surface covers in the designated areas to minimize surface water infiltration."

EPA Response:

EPA agrees with the comment and has incorporated the suggested language with one modification, substituting “designated” with “contaminated,” into the Final Decision.

Comment 10:

Table 1 – several of the documents listed on pages 1 and 2 of Table 1 are referenced to “Koppers”. “Koppers” is defined in the SB as Koppers Industries, Inc. (now Koppers Inc.) . At the time the reports referenced to Koppers on Table 1 were issued, Koppers Industries, Inc. (now Koppers Inc.) was not in existence. The reports on Table 1 should be referenced to Koppers Company, Inc. (now known as Beazer East, Inc.) because Koppers Company, Inc. and Koppers Industries, Inc. (Koppers Inc.) are two totally separate companies.

EPA Response:

EPA agrees with the comment and has incorporated this change in the Final Decision.

The comments received from Kurt Paschl, Beazer East, Inc., and EPA's Responses are set forth below:

<u>Comment 1</u>:

> **Introduction – Page 4: The correct name for the Facility Owner is Koppers Inc. and not Koppers Industries, Inc.**

<u>EPA Response</u>:

> EPA agrees with the comment and has incorporated this change in the Final Decision.

<u>Comment 2</u>:

> **Introduction – Page 4: From our interpretation of the UECA Covenant in West Virginia, EPA will not remain a beneficiary with rights to enforce the Covenant.**

<u>EPA Response</u>:

> EPA does not agree with the comment. EPA anticipates that it will be the approving agency for the Environmental Covenant to be entered pursuant to the West Virginia Uniform Environmental Covenants Act, Chapter 22, Article 22.B, §§ 22-22B-1 through 22-22B-14 of the West Virginia Code, and will have the ability to enforce such covenant.

<u>Comment 3</u>:

> **Proposed Remedy/Sediment – Shallow Depth Removal with Cap – Page 22, first full paragraph. We should point out that the description of the sediment remedy design is conceptual. It may be helpful to indicate that the design is subject to change based on modeling, detailed engineering design, and permitting.**

<u>EPA Response</u>:

> EPA agrees with the comment and has incorporated this change in the Final Decision.

<u>Comment 4</u>:

> **Proposed Remedy/Sediment – Facility Wide Non-Engineering Controls – Page 24, 4th bullet: We suggest that if the facility configuration changes in the future, that a cover of some type should be maintained to limit direct contact exposure to COCs and to**

maintain reduced surface water infiltration. Koppers expects to maintain the right to reconfigure its facility, including changing footprints, as long as exposure restrictions are maintained.

EPA Response:

EPA agrees with the comment and has incorporated this change in the Final Decision.

The comment received from Mark B. Hanish, ARCADIS, and EPA's Response is set forth below:

Comment 1:

> **Proposed Remedy/Sediment – Shallow Depth Removal with Cap – Page 22, first full paragraph. We should point out that the description of the sediment remedy design in the SB is conceptual. It may be helpful to indicate that the proposed design is subject to change based on modeling, detailed engineering design, and permitting.**

EPA Response:

> EPA agrees with the comment and has incorporated this change in the Final Decision.

STATE OF WEST VIRGINIA
COUNTY OF HANCOCK

I, **LISA L. BOYER**, bookkeeper for the publisher of **THE WEIRTON DAILY TIMES** a newspaper in the City of Weirton, State of West Virginia, hereby certify that the annexed publication was inserted in said newspaper on the following date:

Date: 9-10, 2010
Given under my hand this 10th day of September, 2010

Lisa L. Boyer

//

Sworn to and subscribed before me on this 10th
day of September, , 2010
of, in and for HANCOCK COUNTY, WEST VIRGINIA

NOTARY

NOTARIAL SEAL
STATE OF OHIO

NANCY KAUFMANN
NOTARY PUBLIC - STATE OF OHIO
MY COMMISSION EXPIRES JUNE 9, 2012

Nancy Kaufmann

PUBLIC NOTICE
Koppers Industries
Follansbee, WV Facility
DATE OF THIS NOTICE:
September 10, 2010

PURPOSE OF THIS NOTICE: The U.S. Environmental Protection Agency (EPA) is announcing its proposed remedy for the Koppers Industries Facility located in Follansbee, West Virginia, under the Resource Conservation and Recovery Act, as amended, 42 U.S.C. 6901 to 6939(e). EPA proposes a final remedy to continue operation of an existing groundwater pump-and-treat system in the perched zone, continue operation and expansion of an existing product recovery system in the alluvial zone, partial excavation and capping of contaminated sediment, and implementation of institutional controls to protect public health.

FACILITY DESCRIPTION: The 34-acre Facility is located north of the city of Follansbee in Brooke County, West Virginia. The Facility is bounded to the west by the Ohio River, and to the north, east and south by a coke making plant, Severstal Wheeling, Inc. The Facility was first constructed in 1914 by the American Tar Products Company to operate as a tar distillation plant, producing creosote, road tar, and pitches. In September 1990, an Administrative Order on Consent ("Order") was issued pursuant to 42 U.S.C. 6928(h) of the Resource Conservation and Recovery Act to Beazer East, Inc., former owner of the Facility. The Order requires Beazer East to perform interim measures, RCRA facility investigation and a corrective measures study.

INFORMATION AVAILABILITY: A Statement of Basis for the proposed remedy is available on EPA's website at http://www.epa.gov/reg3wcmd/public_notices.htm. The Administrative Record, which contains all the information considered in EPA's proposed decision, is available for public review at the County Clerk's Office, Brooke County Court House, 632 Main Street, Wellsburg, West Virginia, 26070, by request at 304-737-3661.

COMMENT PROCESS: Persons wishing to comment on EPA's proposed remedy must submit comments to EPA within the 30-day comment period ending, **October 11, 2010**. Interested persons may also request a public hearing on this proposed remedy. All comments and/or requests for a hearing must be submitted in writing via mail, fax, or email before **October 11, 2010** to the EPA Project Manager, Andrew Fan, at Mail Code 3LC20, at EPA Region 3's address listed above, Fax: 215-814-3113 or Email: fan.andrew@epa.gov. All comments will be considered in making a final decision.

FINAL DECISION: EPA will make a final decision after considering all comments, consistent with applicable RCRA requirements and regulations. If the decision is substantially unchanged from the one in this notice, EPA will issue a final decision and inform all persons who submitted written comments or requested notice of EPA's final determination. If the final decision is significantly different from the one proposed, EPA will issue a public notice explaining the new decision and will reopen the comment period.

9-10, 2010 Adv.