UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION III

FINAL DECISION AND RESPONSE TO COMMENTS

BEAZER/INDSPEC FACILITY

PETROLIA, PENNSYLVANIA

EPA ID NO. PAD004336731

I. FINAL DECISION

The United States Environmental Protection Agency (EPA) has selected the implementation of land and groundwater use restrictions and the establishment of a Post-Remediation Care Plan as the Final Remedy for the Beazer/INDSPEC facility (the Facility), located at 133 Main Street in Petrolia, Pennsylvania. This determination is based on EPA's findings as detailed in the Statement of Basis (SB) which EPA issued for the Facility on August 18, 2017 and is consistent with EPA's February 2003 *Final Guidance on Completion of Corrective Action Activities at RCRA* Facilities (reference 68 FR 8757).

EPA's Final Remedy relies on the development of a Post-Remediation Care Plan that will include a soil management plan detailing work procedures and personal protective equipment requirements for any intrusive operations conducted within the area of impacted soil or groundwater, inspection and maintenance requirements that ensure the long-term integrity of physical barriers placed over areas of contamination to prevent exposure to potential receptors or mitigate occurrence of free-phase material, maintenance of fencing and/or surveillance methods to restrict Facility access, monitoring requirements for vapor mitigation strategies implemented in occupied buildings within Area of Interest 1, and a monitoring plan for groundwater and surface water. Additionally, EPA's Final Remedy relies on a land use restriction prohibiting residential development or use of the Facility property unless approved by EPA, and a groundwater use restriction prohibiting potable and/or domestic use of groundwater beneath the Facility unless approved by EPA. The components of EPA's Final Remedy may be enforced through an order, permit, or through an Environmental Covenant to be executed pursuant to the Pennsylvania Uniform Environmental Covenants Act, 27 Pa. C.S. Sections 6501-6517 (UECA).

If the Facility fails to meet its obligations or EPA, in its sole discretion, deems that additional activities and/or controls are necessary to protect human health or the environment, EPA has the

authority to require and enforce additional corrective actions consistent with public participation provisions under the Resource Conservation and Recovery Act (RCRA).

II. PUBLIC COMMENT PERIOD

On August 18, 2017, EPA issued a SB in which it announced its proposed remedy for the Facility. Consistent with public participation provisions under RCRA, EPA requested comments from the public on the proposed remedy. The commencement of a thirty (30)-day public comment period was announced in the *Butler Eagle* on August 18, 2017 and on the EPA Region III website. The public comment period was subsequently extended to December 18, 2017; January 31, 2018; and March 31, 2018 via three additional announcements on the EPA website and in the *Butler Eagle* on September 22, 2017; December 22, 2017; and February 16, 2018, respectively. The public comment period ended on March 31, 2018.

III. RESPONSE TO COMMENTS

EPA received thirteen comments from two different commenters. EPA's response to public comments is provided in Attachment B of this document. Each comment is summarized and followed by EPA's response. Minor changes to the proposed remedy were necessary based on the received comments, including limited groundwater and surface water monitoring, maintaining fencing and/or surveillance methods to control Facility access, and specifying that shallow groundwater beneath the Facility shall not be used for any purpose; the Post-Remediation Care Plan will include additional details as provided in EPA's responses to address the comments. The SB is incorporated herein and made a part thereof as Attachment A.

IV. AUTHORITY

EPA is issuing this Final Decision and Response to Comments under the authority of the Solid Waste Disposal Act, as amended by RCRA, and the Hazardous and Solid Waste Amendments (HSWA) of 1984, 42 U.S.C. Sections 6901 to 6992k.

V. DECLARATION

Based on the Administrative Record compiled for the Corrective Action at the Facility, EPA has determined that the Final Remedy selected in this Final Decision and Response to Comments is protective of human health and the environment.

8.22.18

John A. Armstead, Director
Land and Chemicals Division
U.S. EPA Region III

Date

Attachment A: Statement of Basis, August 2017, finalized July 2018 to reflect Response to Comments
Attachment B: Response to Comments

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION III

STATEMENT OF BASIS

BEAZER/INDSPEC FACILITY

133 MAIN STREET
PETROLIA, PENNSYLVANIA

EPA ID NO. PAD004336731

Prepared by
Office of Pennsylvania Remediation
Land and Chemicals Division
August 2017, finalized July 2018

Table of Contents

List of Abbreviations and Acronyms

AOI	Area of Interest
AR	Administrative Record
ATSDR	Agency for Toxic Substances and Disease Control Registry
AWQC	Pennsylvania Ambient Water Quality Criteria
BCACS	Bear Creek Area Chemical Site
EC	Engineering Control
EI	Environmental Indicator
EPA	Environmental Protection Agency
IC	Institutional Control
$\mu g/m^3$	Micrograms per cubic meter
µg/L	Micrograms per liter
NPDES	National Pollutant Discharge Elimination System
PADEP	Pennsylvania Department of Environmental Protection
RCRA	Resource Conservation and Recovery Act
RSL	EPA Regional Screening Level
SB	Statement of Basis
SHS	Statewide Health Standard(s)
SVOC	Semi-volatile Organic Compound
VOC	Volatile Organic Compound

Section 1: Introduction

The United States Environmental Protection Agency (EPA) prepared this Statement of Basis (SB) to solicit public comment on its remedy for the Beazer/INDPSEC facility located at 133 Main Street, Petrolia, Pennsylvania (Facility). The public comment period was open from August 18, 2017 to March 31, 2018. This finalized Statement of Basis reflects EPA's responses to comments received during the open public comment period.

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 to 6992k. The Corrective Action Program is designed to ensure that certain facilities subject to RCRA have been investigated and that all releases of hazardous waste and hazardous constituents have been remediated. The Commonwealth of Pennsylvania (the Commonwealth) is authorized to implement and enforce RCRA, but is not authorized for the Corrective Action program under Section 3006 of RCRA. Therefore, EPA retains primary authority in the Commonwealth for the Corrective Action Program.

Information on the corrective action program as well as a fact sheet (listed under INDSPEC Chemical Corp.) for the Facility can be found at https://www.epa.gov/hwcorrectiveactionsites.

EPA has compiled an administrative record (AR) containing all documents, including data and quality assurance information, on which EPA's remedy is based. See Section 8, Public Participation, for information on how you may review the AR.

Section 2: Background

The Facility comprises approximately 325 acres surrounded by wooded land to the north and east, residential properties to the west, and commercial properties to the south. The Facility is situated along the South Branch of Bear Creek (the Creek) which flows through a fairly steep-walled, narrow valley. The valley floor ranges from 300 to 500 feet wide.

The Facility has been used for industrial purposes by various owners since 1915. Koppers Company (Koppers) purchased it in 1947 and operated a chemical manufacturing plant there for more than four decades. In 1988, Koppers became the company currently known as Beazer East, Inc. (Beazer), which then sold approximately 263 acres of the Facility property, including the manufacturing facilities, to ISC Acquisition Company.

ISC Acquisition Company changed its name to INDSPEC Chemical Corporation (INDSPEC) in 1989 and continued to operate the chemical manufacturing plant at the Facility. The plant ceased production in July 2017. Although the plant made several chemical products, it was one of the world's largest producers of resorcinol, a chemical used in adhesives, dyes, pharmaceuticals, skin creams and lotions, and many other products. The main process and materials storage areas are located along the valley floor on the west side of the Creek. These areas and a reservoir to the north are designated as Area of Interest (AOI) 1. Other process and storage areas located on the eastern slope of the valley and a reservoir directly east of the Creek are designated as AOI 2. The western portion of the Facility, including a third reservoir, is designated as AOI 4. The portion of the Facility containing AOIs 1, 2, and 4 is currently owned by INDSPEC (INDSPEC Property).

The northern portion of the Facility is currently owned by Beazer (Beazer Property). The Beazer Property is designated as AOI 3. It is primarily undeveloped land except for a former waste disposal lagoon, which was closed in 1982 under PADEP oversight.

A location map and a Facility diagram are attached as Figures 1 and 2.

Section 3: Environmental Investigations and Completed Actions

Multiple environmental investigations have occurred over the Facility's history. The most pertinent ones are summarized below. Data from these investigations are the basis for EPA's remedy. Complete reports including results can be found in the AR. See **Section 8: Public Participation**, below, for information on reviewing the AR.

1. Early Investigations

The first environmental investigations at the Facility began in 1979 under the oversight of PADEP (then known as the Pennsylvania Department of Environmental Resources (PADER)). Those investigations detected groundwater contamination in the alluvial and upper bedrock aquifers. The areal extent of contamination was delineated by the Facility's southern boundary, the South Branch of Bear Creek to the east, and the railroad tracks to the west. Contaminants identified included resorcinol, sulfonic acids, benzene, and phenols.

The 1979 investigations concluded that an unlined lagoon used by Beazer to dispose of resorcinol wastes was the primary source of groundwater contamination. The lagoon was located in the southwestern corner of AOI 3. The lagoon was closed in 1982 by removing the remaining liquid wastes, installing a clay slurry wall keyed into the bedrock below, and covering the lagoon with compacted soil.

In 1987, PADEP and Koppers entered into a Consent Order (1987 Order) under the Clean Streams Law. The 1987 Order was primarily concerned with eliminating unpermitted discharges to the Creek, but also included a requirement to design and construct a groundwater collection and treatment system. The Facility installed a French drain groundwater collection and treatment system to collect contaminated groundwater beneath the Facility and to prevent discharge of contaminated groundwater into the Creek. The French drain system operated from 1990 to 2005, when it was permanently shut down after reportedly receiving approval from PADEP to do so; however, no record of this approval appears to exist.

In March 2002, pursuant to its authority under Pennsylvania's Hazardous Sites Cleanup Act (HSCA), 35 P. S. §§ 6020.101—6020.1305, PADEP established a sixty-square-mile area known as the Bear Creek Area Chemical Site (BCACS) that included the Facility. As part of its HSCA activities, PADEP investigated disposal sites located in the vicinity of the Facility that were formerly used by waste haulers serving Beazer, INDSPEC, and other area chemical plants. PADEP concluded that those disposal sites, too, were contributors to contamination of the area's aquifer. As a result of its investigation, PADEP determined that the nature and extent of groundwater contamination throughout the BCACS rendered it impractical to restore the groundwater to levels acceptable for residential use. As a result, PADEP entered into a Consent Order with Beazer in May 2003 (2003 Order) that provided funding both for cleanup of the Facility and for construction of a public water supply to service impacted residents within the BCACS. PADEP also created a model ordinance, which was passed in each municipality within the BCACS, that prohibits potable groundwater use after obtaining a mandatory hookup to the public water supply in order to prevent residential use of impacted portions of the aquifer.

A map of the BCACS is attached as Figure 3. The 2003 Order also required Beazer to submit a workplan to address contamination at the Facility and to enter into a Facility Lead Agreement with EPA (described below). Construction of the public water supply was completed in 2007.

2. RCRA Investigations

The environmental investigations upon which EPA is relying in this SB were prepared using the standards and procedures developed under the Pennsylvania Land Recycling and Environmental Remediation Standards Act, commonly referred to as Act 2. EPA has compared these sampling results to EPA's Maximum Contaminant Levels (MCLs) for groundwater and the Regional Screening Levels (RSLs) for residential and industrial soil, for each of the identified constituents of concern (COCs).

On May 6, 2004, Beazer and INDSPEC entered into a Facility Lead Agreement with EPA to satisfy RCRA corrective action obligations for the Facility using Act 2 standards and procedures. A work plan for site characterization that had been previously submitted to EPA for the Facility in December 2003 was revised in January 2004 and served as the basis for remedial activities from 2004 to 2006. Remedial activities are summarized under Section 3, Current Site Conditions, below. EPA and PADEP have been jointly overseeing the work at the Facility since that time.

In August 2005, the Agency for Toxic Substances and Disease Registry (ATSDR) released a Public Health Assessment in connection with the BCACS. ATSDR's Pubic Health Assessment concluded that exposures to contaminated drinking water in the BCACS prior to 2000, when domestic water supplies were first sampled, posed an indeterminate public health hazard. However, non-drinking exposures to contaminated water (e.g., showering) and exposures to contaminated soil and sediment in the BCACS posed no apparent public health hazard.

Little toxicological data existed in 2003 on the effects of exposure to resorcinol and the sulfonic acids. Therefore, Beazer commissioned a study (by AMEC Earth & Environmental) to develop water quality criteria for resorcinol and sulfonic acids. The AMEC study was submitted in April 2008 and was conducted in accordance with a specific protocol for developing Ambient Water Quality Criteria (AWQC) pursuant to the Clean Water Act, 33 U.S.C. § 1251 et. seq., established by EPA and adopted by the Commonwealth of Pennsylvania. AMEC's proposed criteria were subsequently reviewed and adopted by the Commonwealth of Pennsylvania as AWQC in a regulation promulgated on July 20, 2013. The AWQC have also been incorporated into the National Pollutant Discharge Elimination System (NPDES) permits for the Facility and other facilities located along the South Branch of Bear Creek.

3. Current Site Conditions

Current Facility conditions summarized below are detailed in the June 2013 Remedial Investigation Report and the February 2017 Addendum to the Remedial Investigation Report (which includes a 2015 Surface Water/Sediment Sampling Report). The remedial investigation,

comprising the June 2013 Remedial Investigation Report and the February 2017 Addendum, was approved by EPA in August 2017.

A. Soils

Between 2004 and 2010, 42 surface soil samples from throughout the Facility were collected and analyzed for organic and metal compounds. The results were screened against EPA's RSLs, except for resorcinol, which was screened against Pennsylvania's non-residential Statewide Health Standard (SHS), and sulfonic acids. Sulfonic acids do not have RSLs; therefore, soil concentrations of sulfonic acids were compared to levels determined by the ATSDR Public Health Assessment to not produce adverse health effects. Using ATSDR's most conservative provisional health guideline of 0.03 mg/kg/day yields an approximate industrial RSL of 6600 mg/kg at a target hazard quotient of 1. Although arsenic exceeded its industrial RSL in many surface soil samples, these arsenic concentrations are considered representative of background concentrations throughout this area. However, one area in the southeastern corner of AOI 1 exceeded the arsenic industrial RSL by several orders of magnitude and also exceeded the industrial RSL for lead. All other constituents in surface soil samples taken at the Facility were below the applicable industrial RSLs or non-residential SHSs.

In 2010, additional soil borings were collected and sampled to define the horizontal extent of the arsenic and lead contamination exceeding RSLs in AOI 1. As a result, an approximately 1000-square-foot area of arsenic- and lead-impacted soil was delineated. Consequently, in 2011, an asphalt cap was constructed over this area to prevent exposure to soils that exceeded the industrial RSLs for arsenic and lead.

B. Groundwater

In 2004, two site-wide groundwater sampling events were conducted at the Facility. A total of 151 samples were collected from 72 wells. Between June 2005 and May 2006, 143 additional samples were taken in AOIs 1, 2, and 3.

As the following table indicates, numerous groundwater contaminants exceed their applicable MCL (or SHS for resorcinol, semi-volatiles, and manganese). Resorcinol and volatile organic compounds (VOCs) are particularly concentrated near the former lagoon and the southeastern part of AOI 1. Phenols are also concentrated around the former lagoon. Semi-volatile contaminants and metals are more evenly dispersed throughout the entire Facility.

Groundwater Contaminants That Exceed Applicable Standards

Contaminant	MCL or SHS	Maximum Concentration
	µg/L	µg/L
Specialty Compounds		
Resorcinol	200,000	4,130,000
Volatile Organics		

Benzene	5	290
Chlorobenzene	100	260
1,2-dichlorobenzene	600	12,000
1,4-dichlorobenzene	75	2800
Methylene chloride	5	290 J
Tetrachloroethene	5	6.8 J
Trichloroethene	5	17
Vinyl chloride	2	38
Semi-volatile Organics		
bis(2-ethylhexyl)phthalate	6	380
2-chlorophenol	40	6000
4-methylphenol	510	1600
Phenol	2000	9400
Metals		
Arsenic	10	290
Lead	15	557
Manganese	300	39,500 J

J – estimated concentration

Due to the restriction on residential use of the aquifer beneath the BCACS, the only pathway for public exposure to this contamination is through groundwater migration and discharge into the South Branch of Bear Creek.

C. Surface Water

Five sampling events conducted in the South Branch of Bear Creek from 2004 to 2005 and additional samples taken in 2010 and 2014 did not detect AWQC exceedances for volatile organic compounds (VOCs), resorcinol, or the sulfonic acids. A rapid bioassessment of Creek sediment performed in 2005 as part of the remedial investigation concluded that there is no statistical difference in the benthic community (organisms living in or on the creek bed) collected from on-site locations when compared to upstream reference locations. An instream comprehensive evaluation performed by PADEP in 2010 concluded that aquatic life impacts as a result of the Facility are not discernable due to existing upstream impairment of aquatic life.

Until 2011, seepage of contaminated groundwater into the South Branch of Bear Creek would intermittently cause a diffuse free-phase material with reddish-brown color to accumulate at the Creek bottom. When identified during periodic inspections of the Creek, this free-phase material would be removed from the Creek by vacuum truck. In 2011, INDSPEC and Beazer installed a bentonite cap atop a 430-foot stretch of the Creek bed to block such groundwater seepage into the South Branch of Bear Creek. From September 2011 to September 2012, INDSPEC conducted bi-weekly visual inspections and surface water and hydraulic monitoring to evaluate the integrity of the bentonite cap. The results of the monitoring did not show any evidence of groundwater penetrating the bentonite cap or any free-phase material on the Creek bottom. From April 2012 to June 2013, INDSPEC performed additional efforts to seal cracks

and weep holes in the concrete walls along the Creek which also minimized shallow groundwater seepage into the South Branch of Bear Creek.

The bentonite cap was damaged during a significant storm/flood event in August 2013 and free-phase material was again intermittently observed in the Creek. Following the storm/flood event, INDSPEC inspected the Creek regularly and recovered any observed free-phase material. An improved multi-component engineered cap with a High Density Polyethylene (HDPE) liner and concrete armoring (hereinafter referred to as the "engineered system") was installed in 2016 and is designed to withstand a 100-year design flow flood event.

D. Subsurface Vapor

Chemical vapors released from contaminated soil or groundwater can migrate through foundations and accumulate in occupied buildings. In 2009, a vapor intrusion evaluation of AOI 1 was performed. In 2012 and 2013, soil gas testing was conducted near occupied buildings including the Recovery Building, Boiler House Control Room, and No. 1 Building which showed exceedances of EPA's industrial RSLs for VOCs, as shown in the table below.

Soil Gas Contaminants That Exceed Industrial RSLs

Contaminant	Industrial RSL*	Maximum Concentration
	$\mu g/m^3$	$\mu g/m^3$
VOCs		
Benzene	16	29
1,3-Butadiene	4.1	5.3
Ethylbenzene	49	300
Naphthalene	3.6	39
Trichloroethene	30	2700
Trimethylbenzene	310	1800

* Industrial RSLs for soil gas were derived by dividing EPA's Industrial Air RSLs by 0.1

Section 4: Corrective Action Objectives

1. Soils

Given that the current and anticipated future use of the Facility is expected to remain industrial, soils at the Facility were primarily screened against industrial RSLs. Surface soils exceed industrial RSLs for direct contact for both arsenic and lead in a 1,000-foot area in the southeast corner of AOI 1. Subsurface soils at the Facility exceed industrial RSLs for direct contact beneath the cap in the former lagoon area of AOI 3. Therefore, the corrective action objectives for soils are to:

- Prevent residential direct contact exposures to soil containing COC concentrations that exceed applicable PADEP/EPA residential screening levels,
- Prevent non-residential direct contact exposures to soil containing COC concentrations that exceed applicable PADEP/EPA non-residential screening levels, including for utility and construction workers engaged in excavation, and
- Inspect and maintain all engineering controls to assure effective operation.

2. Groundwater

EPA expects final remedies to return usable groundwater to its maximum beneficial use within a timeframe that is reasonable given the particular circumstances of the project. For projects where aquifers are either currently used for water supply or have the potential to be used for water supply, EPA will use the National Primary Drinking Water Standard Maximum Contaminant Levels (MCLs) promulgated pursuant to Section 42 U.S.C. §§ 300f et seq. of the Safe Drinking Water Act and codified at 40 CFR Part 141 as the corrective action objectives.

EPA agrees with PADEP's decision to restrict potable use of groundwater in the BCACS. Given the nature and extent of groundwater contamination in the BCACS, it would be impractical to remediate the entire aquifer to levels acceptable for residential use. While the contaminants in Facility groundwater originated from Facility operations, similar contamination throughout the aquifer beneath the BCACS comes from several offsite sources. Therefore, the corrective action objectives for groundwater are to:

- Prevent drinking water exposure to all constituents that exceed EPA MCLs and PADEP MSCs for a used aquifer, and
- Control the groundwater discharge to the South Branch of Bear Creek such that AWQCs are not exceeded and no free-phase material is observed within the stretch of the Creek within the Facility property boundary.

2. Subsurface Vapor

Subsurface vapor in portions of AOI 1 exceeds EPA's industrial RSLs. Therefore, the corrective action objective for subsurface vapor is to:

- Ensure that TCE vapor levels in all occupied buildings, both current and planned, do not exceed the industrial air non-carcinogenic RSL.

Section 5: Remedy

The remedy includes a combination of institutional controls (ICs) and engineering controls (ECs). ECs include a variety of physical devices, barriers, and management practices that contain, reduce the source of, or prevent exposure to contamination. ICs are generally non-engineered mechanisms such as administrative and/or legal controls that minimize the potential for human exposure to contamination and/or protect the integrity of a remedy. Under this remedy, some concentrations of metals, VOCs, and resorcinol remain in the soils and groundwater at the Facility above levels appropriate for residential and domestic uses. As a result, the remedy requires Beazer and INDSPEC to implement land use restrictions to prohibit human exposure to such contaminants. ICs may be established through an enforceable mechanism such as an order, permit, or an environmental covenant pursuant to the Pennsylvania Uniform Environmental Covenants Act, 27 Pa.C.S. §§ 6501-6517. If the enforceable mechanism selected were to be environmental covenants, they would be recorded with Beazer and INDSPEC property records.

1. Beazer Property

a. Engineering Controls

1) Beazer shall develop and implement a Post-Remediation Care Plan for the Beazer Property to be approved by EPA which will include schedules and methodologies for implementing the following activities:

a. Soils
   i. Monitoring and maintaining the integrity of the vegetative cover on the former lagoon.
   ii. Implementing a soil management plan and outlining personal protective equipment (PPE) and work procedures for any intrusive operations.
   iii. Maintaining fencing and/or surveillance methods to restrict property access.

b. Groundwater
   i. Sampling groundwater to confirm contaminant source stability and hydrogeologic conditions.

c. Surface Water
   i. Inspecting Bear Creek near and downstream of the former lagoon to determine whether free-phase material is present or absent and, if present, developing a procedure and timeline for surface water sampling and corrective actions to be undertaken to prevent exceedance of AWQC and free-phase material recurrence within AOI 3.
   ii. Sampling surface water to confirm contaminant source stability and hydrogeologic conditions.

b. Institutional Controls

EPA requires the following land and groundwater use restrictions be implemented through ICs at the Beazer Property:

1) Soils

d. The Beazer Property shall not be used for residential purposes unless it is demonstrated to EPA that such use will not pose a threat to the environment or adversely affect or interfere with the selected remedy and EPA provides prior written approval of such use.
e. Any excavation or other construction activity within the footprint of the former lagoon in AOI 3 is prohibited without EPA's prior written approval.
f. Compliance with the EPA-approved Post Remediation Care Plan for the Beazer Property.

2) Groundwater

a. Groundwater at the Beazer Property shall not be used for any potable and/or domestic purpose, and shallow groundwater (less than 100 feet below ground surface) shall not be used for any purpose.

2. INDSPEC Property

a. Engineering Controls

1) INDSPEC shall develop a Post Remediation Care Plan for the INDSPEC Property to be approved by EPA which will include schedules and methodologies for implementing the following activities:

a. Soils
   i. Monitoring and maintaining the integrity of the asphalt cap in the southeastern portion of AOI 1.
   ii. Implementing a soil management plan and outlining PPE and work procedures for any intrusive operations.
   iii. Maintaining fencing and/or surveillance methods to restrict property access.

b. Groundwater
   i. Sampling groundwater to confirm contaminant source stability and hydrogeologic conditions.

c. Surface Water
   i. Inspecting Bear Creek to determine whether free-phase material is present or absent and, if present, developing a procedure and timeline for surface

water sampling and corrective actions to be undertaken to prevent exceedance of AWQC and free-phase material recurrence within AOI 1 or AOI 2.

ii. Operating, repairing, monitoring, and maintaining the engineered system that limits, to the extent practicable, groundwater infiltration.

iii. Inspection of the Creek retaining wall within the 430-linear-foot section of the Creek and patch cracks or holes within this area that could allow groundwater to seep into the Creek.

iv. Sampling surface water to confirm contaminant source stability and hydrogeologic conditions.

d. Subsurface Vapor

i. Monitoring the effectiveness of vapor mitigation strategies in any occupied buildings in the main plant area of AOI 1, to include alarms that sound automatically if positive pressure or air exchange rate drops below acceptable levels.

c. <u>Institutional Controls</u>

EPA requires the following land and groundwater use restrictions be implemented through ICs at the INDSPEC Property:

1) Soils

a. The INDSPEC Property shall not be used for residential purposes unless it is demonstrated to EPA that such use will not pose a threat to the environment or adversely affect or interfere with the selected remedy and EPA provides prior written approval of such use.

b. Compliance with the EPA-approved Post Remediation Care Plan for the INDSPEC Property.

2) Groundwater

a. Groundwater at the INDSPEC Property shall not be used for any potable and/or domestic purpose, and shallow groundwater (less than 100 feet below ground surface) shall not be used for any purpose.

b. Compliance with the EPA-approved Post Remediation Care Plan for the INDSPEC Property.

3) Subsurface Vapor

a. A vapor intrusion assessment shall be required prior to any new construction of an occupied building in AOI 1 unless the building plan includes, and the building is constructed with, a vapor mitigation system (VMS) that reduces indoor air contamination to acceptable levels as determined by EPA at that

time.

b. Compliance with the EPA-approved Post Remediation Care Plan for the INDSPEC Property.

Section 6: Evaluation of Remedy

Consistent with national guidelines, EPA evaluates corrective action remedies in two phases. EPA first evaluates them against three threshold criteria. For those meeting the threshold criteria, EPA then evaluates seven balancing criteria.

Threshold Criteria	Evaluation
1) Protect human health and the environment	The remedy protects human health and the environment by eliminating or mitigating exposure pathways. Soil exposure is generally limited by land use restrictions that prohibit residential development on the Facility property. Exposure to soil in the southeastern corner of AOI 1 that exceeds the industrial RSLs for metals is prevented by permanently maintaining a paved surface over the contaminated area. Exposure to soil gas vapors inside existing and occupied structures on AOI 1 will be mitigated by engineering controls either to maintain positive pressure inside the buildings at all times or to ensure that increased air exchange rates provide sufficient ventilation. Exposure to groundwater beneath the Facility property will be restricted by ICs which will prohibit groundwater use for domestic purposes. The remedy prevents discharge of free-phase material to a 430-foot stretch of Bear Creek by minimizing, to the extent practicable, groundwater mixing with surface water through the installation of the engineered system.
2) Achieve media cleanup objectives	The remedy would achieve site-specific media cleanup objectives by eliminating or mitigating exposure pathways to remaining contamination. It would prohibit domestic use of groundwater and require that protective caps be maintained over contaminated soils. The engineered system installed in Bear Creek restricts, to the extent practicable, groundwater mixing with surface water to prevent discharge of free-phase material. Engineering controls will be required to mitigate potential exposures to indoor air contamination within occupied buildings in AOI 1.
3) Remediating the source of releases	The first of two main sources of site-related groundwater contamination was partly remediated in 1982 through the removal of waste from the lagoon and covering the lagoon with compacted soil. Given the level of groundwater contamination originating offsite and the prohibition on

Threshold Criteria	Evaluation
	domestic uses of groundwater, further remediation of the lagoon and other contaminated soil is not warranted. The second main source was remediated from 1990 to 2005 by the French drain groundwater collection system and later by vacuum collection of visible free-phase material that occasionally discharged to the Creek prior to installation of the engineered system. The remedy limits groundwater mixing with surface water to prevent discharge of free-phase material into the South Branch of Bear Creek via the engineered system.

Balancing Criteria	Evaluation
4) Long-term effectiveness	The institutional and engineering controls will maintain protection of human health and the environment over time by controlling exposure to remaining waste material in the former lagoon, lead and arsenic contamination in soil and potential volatile contaminants in AOI 1, and contaminated groundwater. EPA's remedy requires the compliance with and maintenance of land use and groundwater use restrictions. EPA anticipates that these restrictions will be implemented through an enforceable permit, order, or an environmental covenant to be recorded with the Beazer and INDSPEC property records.
5) Reduction of toxicity, mobility, or volume of the hazardous constituents	The remedy limits contaminant mobility by restricting excavation of contaminated soils, requiring maintenance of caps over the lagoon and the most contaminated area of AOI 1, and by requiring the operation and maintenance of the engineered system along the 430-foot stretch of the Creek.
6) Short-term effectiveness	EPA anticipates that the land and groundwater use restrictions will be implemented shortly. The effectiveness of the engineered system will be demonstrated through a schedule of Creek inspections and surface water sampling to ensure that free-phase material is not entering the Creek along the span of the engineered system or within the downstream portion of the

Balancing Criteria	Evaluation
	Creek within the Facility boundary, and that AWQC are being met.
7) Implementability	EPA's remedy is readily implementable. EPA does not anticipate any regulatory constraints in requiring Beazer and INDSPEC to implement the engineering and institutional controls described above.
8) Cost	The remedy is cost effective. The remaining post-remediation care costs are minimal (estimated at $50,000 per year). This cost is lower than remedial alternatives that could include excavation and disposal of contaminated soil, demolition and reconstruction of buildings, and operational interruptions.
9) Community acceptance	EPA will evaluate community acceptance during the public comment period and provide an analysis in the Final Decision and Response to Comments.
10) State/support agency acceptance	EPA will evaluate state acceptance during the public comment period and provide an analysis in the Final Decision and Response to Comments.

Section 7: Financial Assurance

EPA has evaluated whether financial assurance is necessary to implement EPA's remedy at the Facility. The costs of implementing the remaining remedial components, such as the institutional controls, at the Facility are expected to be minimal. The previous bentonite cap failed due to flooding of the Creek, which resulted in free-phase material once again discharging into the Creek. The damaged cap was replaced with a strengthened and armored engineered system much more resistant to flood damage.

EPA requires financial assurance to cover the cost of replacing the current engineered system in the event of flood damage. Additionally, financial assurance should be adequate to cover the cost of maintaining and repairing the lagoon cap/closure in AOI 3, as well as the cost of permanent closure of the French Drain collection system and groundwater monitoring wells throughout the Facility. EPA requires that INDSPEC and Beazer submit a cost estimate and provide financial assurance for such post remedial care to EPA. EPA will then decide on the best enforcement framework for long-term implementation.

Section 8: Public Participation

The public comment period was announced in *The Butler Eagle* and was open from August 18, 2017 to March 31, 2018. This finalized Statement of Basis reflects EPA's responses to comments received during the open public comment period.

The Administrative Record contains all information considered by EPA for the remedy. It is available at the following location:

U.S. EPA Region III
1650 Arch Street
Philadelphia, PA 19103
Contact: Griff Miller (3LC20)
Phone: (215) 814-3407
Fax: (215) 814-3113
Email: miller.griff@epa.gov

Date: 8.22.18

John A. Armstead, Director
Land and Chemicals Division
U.S. EPA Region III

Attachments:
Figure 1: Location Map
Figure 2: Facility Diagram
Figure 3: BCACS Boundaries

Section 9: Index to Administrative Record

Consent Order and Agreement between the Commonwealth of Pennsylvania Department of Environmental Resources and Koppers Company, Inc., August 12, 1987.

Consent Order and Agreement between the Commonwealth of Pennsylvania Department of Environmental Protection and Beazer East, Inc., May 5, 2003.

RCRA Site Inspection Report for INDSPEC Chemical Corporation, prepared by USACE, May 2003.

Workplan for Site Characterization for Beazer/INDSPEC Properties, including Facility Lead Agreement, prepared by Langan Engineering, January 2004. Please list the FLA separately here.

Letter to Mr. George Luxbacher, Glenn Springs Holdings Inc., from Paul Gotthold, USEPA Region 3, regarding entry into voluntary Facility Lead Agreement, May 6, 2004.

Environmental Indicator Forms and Supporting Documentation Report for Beazer/INDSPEC Properties, prepared by Langan Engineering, September 2004.

Documentation of Environmental Indicator Determination – Current Human Exposures Under Control for INDSPEC, PAD004336731, prepared by USEPA Region 3, September 2004.

Public Health Assessment of Bear Creek Chemical Area, prepared by ATSDR, August 2005.

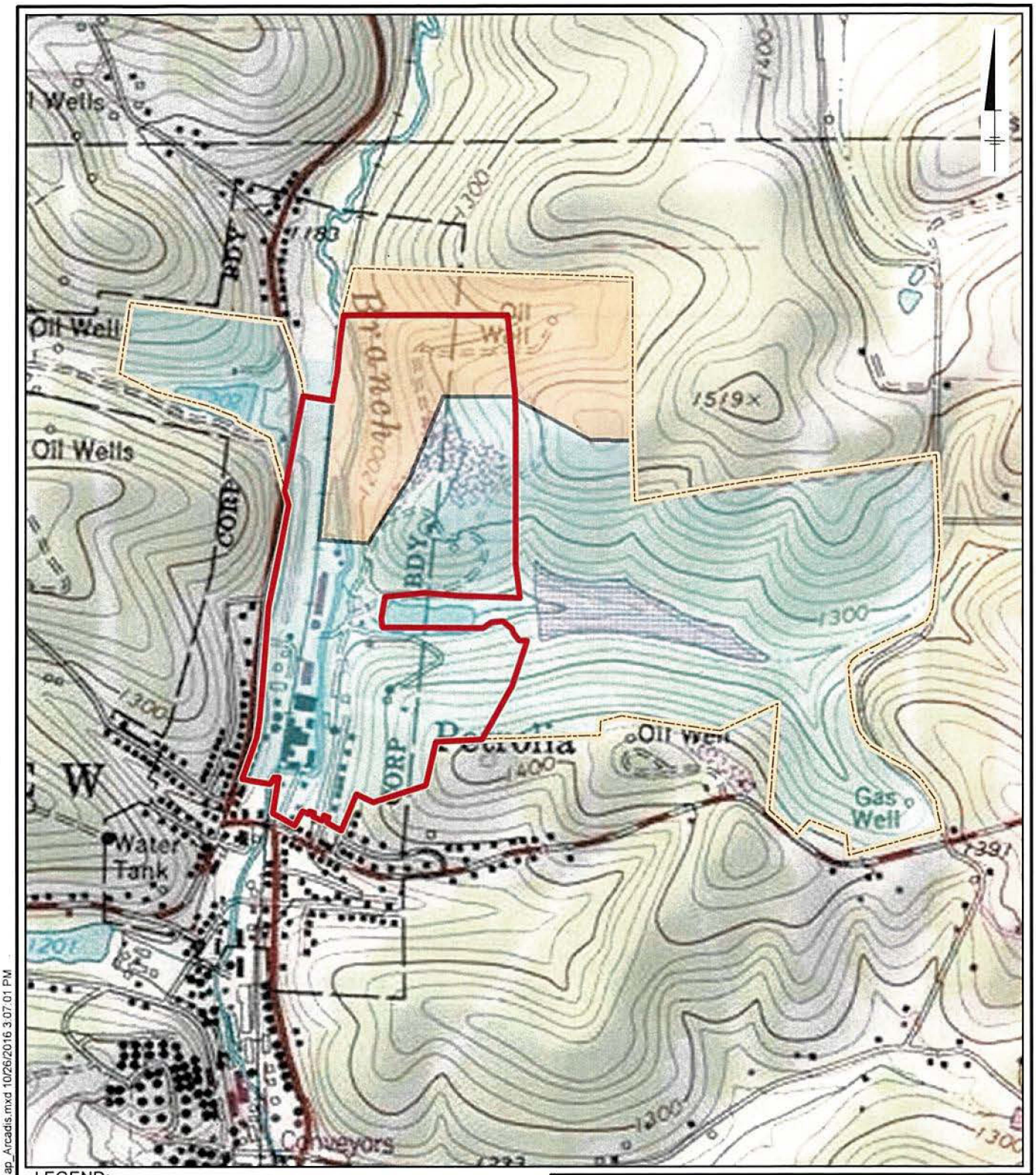
Documentation of Environmental Indicator Determination – Migration of Contaminated Groundwater Under Control for Beazer/INDSPEC Properties, PAD004336731, prepared by USEPA Region 3, September 2005.

Development of Ambient Water Quality Criteria for Benzene Metadisulfonic Acid, Benzene Monosulfonic Acid, p-Phenol Sulfonic Acid, and Resorcinol, prepared by AMEC, April 2008.

Remedial Investigation Report for Beazer/INDSPEC Properties, prepared by Langan Engineering, June 2013.

Surface Water/Sediment Sampling Report, South Branch of Bear Creek, prepared by Arcadis, August 2015.

Addendum to Remedial Investigation Report, Beazer/INDSPEC Properties, prepared by Arcadis, February 2017.



LEGEND:

- ACT 2 SITE BOUNDARY
- BEAZER/INDSPEC PROPERTIES BOUNDARY
- TRACT 1 AREA
- TRACT 2 AREA

0 1,000 2,000 Feet

GRAPHIC SCALE

NOTE:
1. TOPOGRAPHIC QUADRANGLE FOR PARKER, PENNSYLVANIA OBTAINED FROM ESRI IMAGE SERVICES.
2. FIGURE OBTAINED FROM LANGAN ENGINEERING & ENVIRONMENTAL SERVICES, INC. JUNE 2013 REMEDIAL INVESTIGATION REPORT.

BEAZER/INDSPEC PROPERTIES
PETROLIA, PENNSYLVANIA

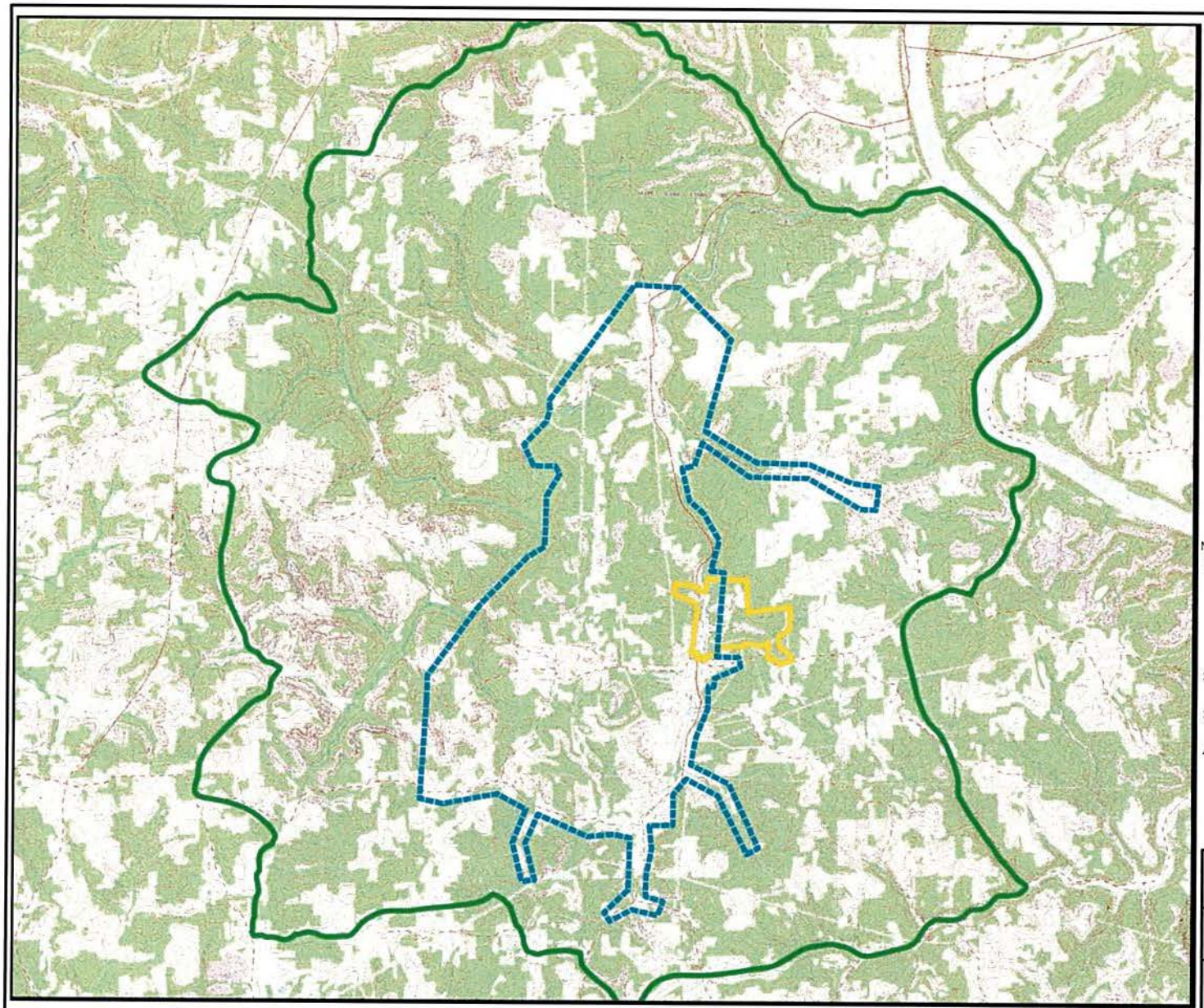
REMEDIAL INVESTIGATION REPORT ADDENDUM

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1R

City: SYR Div/Group: IM/DV Created By: Jayme Rapp Last Saved By: Kives
Beazer Petrolia (39303.13.1)
Q:\Beazer\Petrolia\PA\RAR\mxds\SiteLocationMap_Arcads.mxd 10/26/2016 3:07:01 PM



LEGEND

- OU2 PUBLIC WATER SUPPLY REMEDIAL REPONSE AREA
- BEAZER/INDSPEC PROPERTIES BOUNDARY
- BEAR CREEK AREA CHEMICAL SITE

NOTES:

1. USGS TOPOGRAPHIC MAP, PARKER, PA QUADRANGLE, U.S. GEOLOGICAL SURVEY,1963, REVISED 1979; USGS TOPOGRAPHIC MAP, EAST BUTLER, PA QUADRANGLE, U.S. GEOLOGICAL SURVEY, 1964, REVISED 1993; USGS TOPOGRAPHIC MAP, HILLIARDS, PA QUADRANGLE, U.S. GEOLOGICAL SURVEY, 1963, REVISED 1972; USGS TOPOGRAPHIC MAP, CHICORA, PA QUADRANGLE, U.S. GEOLOGICAL SURVEY, 1964, REVISED 1993.
2. FEATURE BOUNDARIES PROVIDED IN 2003 COA BETWEEN BEAZER AND PADEP.
3. FACILITY SITE BOUNDARY TRACED FROM "PROPERTY SURVEY OF KOPPERS COMPANY, INC., 1988".
4. FIGURE OBTAINED FROM LANGAN ENGINEERING & ENVIRONMENTAL SERVICES, INC. JUNE 2013 REMEDIAL INVESTIGATION REPORT.

0 5,000 10,000 Feet

GRAPHIC SCALE

BEAZER/INDSPEC PROPERTIES
PETROLIA, PENNSYLVANIA

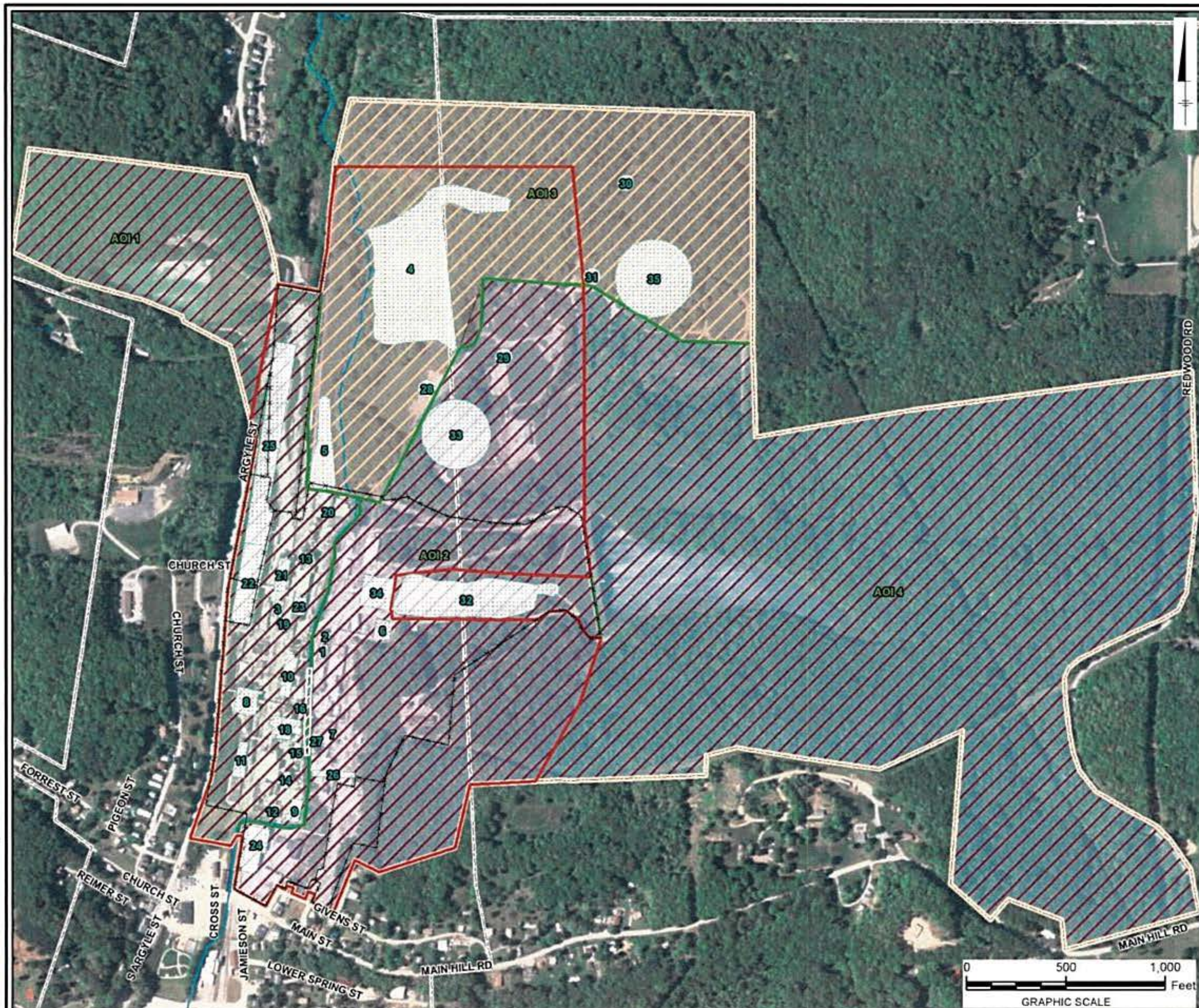
REMEDIAL INVESTIGATION REPORT ADDENDUM

BEAR CREEK AREA CHEMICAL SITE MAP
BEAZER/INDSPEC PROPERTIES
PETROLIA, PENNSYLVANIA

ARCADIS Design & Consultancy for natural and built assets

FIGURE **2aR**

City: SYR Div/Group: IMDV Created By: K.Ives Last Saved By: K.Ives
Q:\Beazer\Petrolia\PA\RAR\mxds\BearCreekArea\ChemicalSiteMap.mxd 10/27/2016 12:23:41 PM



LEGEND:

- FENCE
- SOUTH BRANCH BEAR CREEK
- ACT 2 SITE BOUNDARY
- POTENTIAL SOURCE AREA
- AREAS OF INTEREST
- BEAZER/INDSPEC PROPERTIES BOUNDARY
- COMPLETED REMEDIAL AREA (AQUABLOK CAP)
- TRACT 1 AREA
- TRACT 2 AREA

AREAS OF INTEREST

- AREA OF INTEREST 1
- AREA OF INTEREST 2
- AREA OF INTEREST 3
- AREA OF INTEREST 4

ID	*Potential Source Area Description*
1	Holding Tanks East of Bear Creek
2	Holding Tanks East of Bear Creek
3	Former USTs in Maintenance Garage Area
4	Hillside Wastewater Sprayfield
5	Former Unlined Wastewater Lagoon
6	Benzene Spill at Water Chill Tower
7	Former 20,300-gallon Formaldehyde Storage Tank
8	Boiler House
9	Bate Resorcylic Acid Production and Warehouse
10	By-Product Recovery Building
11	Caustic Storage Area
12	Control Laboratory
13	Copeland Unit
14	Distillation Building
15	Extraction Building
16	Hot Well
17	Main Plant Sump
18	Number 1 Building
19	Oleum (Fuming Sulfuric Acid) Unloading Area
20	Raffinate/Lagoon Tank
21	Sulfite and Sulfate (Dry) Storage Area
22	Wastewater Treatment Plant
23	Acid House
24	Flaker, Bagging, and Storage Building
25	North Gate Sprayfield
26	Ether Release in Hill Plant Area
27	Filter House
28	Former Concrete Burn Pit
29	Potential Storage Area Based on 1962 Aerial
30	Existing Oil/Gas Well
31	Existing Oil/Gas Well
32	Dam #1 Reservoir
33	Tear Gas Filter Media Disposal Area
34	Potential Pit / Pond / Lagoon
35	Drilling Mud Disposal Area

NOTES:

1. 2015 IMAGERY OBTAINED FROM ESRI IMAGE SERVICE.
2. FIGURE OBTAINED FROM LANGAN ENGINEERING & ENVIRONMENTAL SERVICES, INC. JUNE 2013 REMEDIAL INVESTIGATION REPORT.

BEAZER/INDSPEC PROPERTIES
PETROLIA, PENNSYLVANIA

REMEDIAL INVESTIGATION REPORT ADDENDUM

AREAS OF INTEREST AND POTENTIAL SOURCES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
5R

City: SYR Div/Group: SWG Created By: K.IVES Last Saved By: Kives
Q:\Beazer\Petrolia\PA\RAR\mxds\SiteLocationMap\AreasofInterest.mxd 10/26/2016 3:05:40 PM

PUBLIC COMMENTS

A. Comments submitted by Mr. Al Randall

Mr. Al Randall requested a public meeting via an email message sent on September 10, 2017 to Griff Miller, EPA Corrective Action Project Manager. This email message was received by EPA during the 30-day public comment period for the Statement of Basis (SB) for the former Beazer/INDSPEC facility (Facility), in which the Agency publicized its proposed remedy under the Resource Conservation and Recovery Act (RCRA) Corrective Action Program for the Facility. Mr. Randall attended the public meeting held on March 19, 2018 and reiterated his emailed comments during the meeting. Mr. Randall submitted the following comments in his September 10, 2017 email:

1. Comment: *Who exactly are the responsible parties for the Site proper? INDSPEC became a wholly owned subsidiary of Occidental Petroleum Corp. in 2002. What will be the division of responsibility between Beazer and OXY. The sale to OXY should be stated in your Background section. It seems to me that fiscal responsibility should be stated/determined up front.*

   EPA Response: The purpose of a Statement of Basis is to identify EPA's proposed remedy and solicit public review and comment on the proposal. EPA proposes remedies as necessary to protect human health and the environment based on risks identified during environmental investigations conducted at the facilities, independent of who is ultimately responsible for implementing EPA's selected remedy.

   Where there is a release of hazardous waste into the environment from a facility, EPA has the authority to require the owner and/or operator of that facility to take corrective measures as necessary to protect human health or the environment. After selecting a final remedy for the facility, EPA will assess how best to implement the selected remedy, i.e., through an order, permit, or environmental covenant, and which entity will have the responsibility to do so.

2. Comment: *How is it that there is no written documentation of an agreement between PADEP and INDSPEC to cease operation of the pump and treat system in 2005? This system was designed, built, and operated under a consent order. I do not understand how there cannot be paperwork documenting the approval to cease operations.*

   EPA Response: As stated in the SB, PADEP required Koppers to design and construct a groundwater collection and treatment system pursuant to a 1987 Consent Order. That system operated from 1990 until 2005 when it was permanently shut down after Koppers performed a shutdown test in 2005 and received approval from PADEP to do so. Unfortunately, PADEP was unable to find a copy of a written approval letter. For more information regarding the shutdown of the system required under the 1987 Consent Order, please contact PADEP at 814-332-6648.

In 2005, INDSPEC conducted a study to determine the effectiveness of the system in preventing the release of free-phase material to the South Branch of Bear Creek. The study concluded that the system was having no measurable effect on the Free Phase Material released to the Creek; no adverse surface water impacts were observed (based on monitoring total dissolved solids within the creek) and no significant changes in site hydraulics were detected. Therefore, EPA has determined that operation of a groundwater collection and treatment system is not necessary to protect human health and the environment.

3. Comment: *The monitoring program for the "Engineered controls", plugging cracks in the creek walls, observing the creek bottom barrier, should be event driven as well as date driven.*

   EPA Response: EPA agrees and will specify events, such as high rainfall or flooding, that will also trigger inspections of the engineering controls under the monitoring program to be outlined in the Post-Remediation Care Plan (PRCP).

B. Public Comments Submitted by the Pennsylvania Department of Environmental Protection

The Pennsylvania Department of Environmental Protection (PADEP) submitted comments on the SB via an email message to Griff Miller, EPA, dated March 30, 2018. EPA has carefully reviewed PADEP's comments and found merit with many of the issues raised. Accordingly, EPA has modified the Final Remedy from the one proposed in the SB to reflect PADEP's comments, as discussed in more detail below.

A prevalent concern raised by PADEP is that Beazer/INDSPEC did not met all of the requirements in Act 2. Specifically, in the cover letter accompanying its comments, PADEP stated that the PADEP has not received an acceptable Remedial Investigation Report and Risk Assessment Report; therefore, PADEP "does not support EPA's Statement of Basis at this time." EPA is cognizant of PADEP's concerns with respect to Beazer/INDSPEC's satisfaction of Act 2 standards and procedures and has had multiple discussions with the Department concerning those matters. Nonetheless, as described in the SB, EPA found that the data, source characterization, and conceptual site model provided sufficient information on which to base its proposed remedy.

In its letter, PADEP also states that "The Work Plan contemplated the corrective action objectives for the site would be met by satisfying the requirements of Act 2." As a general matter, PADEP has the authority to administer its Act 2 Program and EPA has the authority in the Commonwealth for RCRA Corrective Action. Nothing in the Work Plan relieves Beazer/INDSPEC from requirements of both programs. Rather, the Work Plan sets forth the Agencies' intent to streamline an approach to complete federal corrective action at the Facility and to concurrently allow the Facility to receive a liability release from PADEP under Act 2. So, while the Agencies coordinated their review and approval processes, to the greatest extent

possible, so that the requirements of both programs were met simultaneously, the Agencies must render separate decisions for the Facility and are not compelled to come to identical decisions.

PADEP submitted the following comments in its March 30, 2018 email:

1. Comment: *On page 6 of the Statement of Basis, EPA incorrectly states: "The environmental investigations upon which EPA is relying in this [Statement of Basis] were prepared using the standards and procedures developed under the Pennsylvania Land Recycling and Environmental Remediation Standards Act, commonly referred to as Act 2. PADEP compared the sampling results obtained during these investigations to Act 2 Statewide Health Standards (SHSs), otherwise known as Medium Specific Concentrations."*

   PADEP has pointed out on more than one occasion since 2004 that the investigation conducted at the Facility did not meet the standards and procedures developed under Act 2. Specifically, PADEP does not concur that the requirements for sufficiency of data collection, source characterization, and development of a site conceptual model in support of a risk assessment have been met. In 2014, the PADEP advised Beazer East, Inc. of numerous deficiencies that must be addressed. Further, PADEP did not compare the sampling results obtained during these investigations to Act 2 Statewide Health Standards because PADEP has not received a remedial investigation report meeting Act 2. If EPA is accepting the environmental investigations, the Statement of Basis should accurately reflect that these investigations do not meet PADEP standards under Act 2.

   EPA Response: First, with respect to EPA's statement that "The environmental investigations upon which EPA is relying in this SB were prepared using the standards and procedures developed under the Pennsylvania Land Recycling and Environmental Remediation Standards Act, commonly referred to as Act 2.", EPA acknowledges that PADEP has the authority to decide if Beazer/INDSPEC's efforts under Act 2 meet [Act 2] "requirements for sufficiency of data collection, source characterization, and development of a site conceptual model in support of a risk assessment…". However, EPA's statement conveyed that Beazer/INDSPEC followed the Act 2 protocols with respect to its preparation of documents, i.e., the Notice of Intent to Remediate (NIR), the Remedial Investigation Report (RIR), and Risk Assessment, that were submitted to PADEP for review and approval. EPA's statement did not speak to PADEP's assessment of the sufficiency of those documents.

   Second, EPA will not include the following statement (page 6 of SB) in its Final Decision and Response to Comments: "PADEP compared the sampling results obtained during these investigations to Act 2 Statewide Health Standards (SHSs), otherwise known as Medium Specific Concentrations." In the FDRTC, the first paragraph under Section 3.2. (RCRA Investigations) now reads:

   > The environmental investigations upon which EPA is relying in this SB were prepared using the standards and procedures developed under the Pennsylvania

Land Recycling and Environmental Remediation Standards Act, commonly referred to as Act 2. EPA has compared the sampling results obtained during those investigations to EPA's Maximum Contaminant Levels (MCLs) for groundwater and the Regional Screening Levels (RSLs) for residential and industrial soil, for each of the identified constituents of concern (COCs).

It is important to understand the context in which EPA reviewed the data contained in the RIR and RIR Addendum. In 2014, PADEP identified certain deficiencies in the original RIR. EPA agreed with the PADEP analysis and subsequently PADEP and Beazer/INDSPEC developed a "punch list" to guide additional data collection. Beazer/INDSPEC conducted additional sampling, particularly of sediment and surface water. These data were ultimately presented in the 2017 RIR Addendum submitted to both PADEP and EPA for review. EPA reviewed the data and concluded that the data collection summarized in the RIR Addendum Report was sufficient to address data gaps that PADEP had identified in the "punch list".

EPA determined that data collection, source characterization, and conceptual site model development were sufficient to support EPA's proposed corrective action objectives for the proposed remedy. EPA relied primarily on the Remedial Investigation Report for Beazer/INDSPEC Properties, prepared by Langan Engineering, June 2013; the Surface Water/Sediment Sampling Report, South Branch of Bear Creek, prepared by Arcadis, August 2015; and the Addendum to Remedial Investigation Report, Beazer/INDSPEC Properties, prepared by Arcadis, February 2017. These documents can be found in the Administrative Record and collectively comprise the RCRA Facility Investigation (RFI) for RCRA Corrective Action purposes.

2. Comment: *The Proposed Remedy does not satisfy RCRA corrective action obligations by using Act 2 standards and procedures as required by the Facility Lead Agreement. The requirements of Act 2 for remedial investigation, risk assessment or cleanup have not been met.*

   EPA Response: EPA disagrees. EPA determined, based on its review of the RIR and RIR Addendum submitted by Beazer pursuant to Act 2, that the proposed remedy would meet the corrective action objectives enumerated in the Statement of Basis by pathway elimination provided by the engineered cap and the restriction placed on groundwater by PADEP in the area known as the Bear Creek Area Chemical Site (BCACS).

   In the Facility Lead Agreement, EPA expressed its intent to delegate the primary oversight for the remediation of the Facility, including RCRA Corrective Action, to PADEP using the requirements of Act 2. In doing so, EPA was acting consistently with the One Clean Up Program which provides a mechanism for the Agencies to cooperate "to achieve cleanups that protect human health and the environment by making greater use of all available authorities, and selecting the optimum programmatic tools to increase the pace, effectiveness, efficiency, and quality of cleanups." In fact, EPA did rely on data submitted to PADEP in the RIR and RIR Addendum under Act 2, rather than requiring

Beazer to repackage and submit the data to EPA in the form of a RFI Report, the document traditionally required by the RCRA Corrective Action Program.

However, because the Commonwealth of Pennsylvania has not applied for, nor has it received, authorization for the Corrective Action Program under Section 3006 of RCRA, EPA retains all authority in the Commonwealth for RCRA Corrective Action and is obligated to evaluate the data to ensure that the federal corrective action obligations are met. To that end, the FLA stated that EPA will issue a Final Agency Determination that corrective action has been completed for the Facility in accordance with RCRA.

Specifically:

a. *The proposed remedy includes visual inspections for Free Phase Material in surface water without consideration of contaminants that could be present as a dissolved phase. There are several compounds of concern for which site data indicates, that when present in surface water at high enough concentrations, leads to the appearance of Free Phase Material. These include 2,4,3-trihydroxydiphenyl, benzene, benzene sulfonic acid, benzene-meta-disulfonic acid, meta and para-phenolsulfonic acid, phenol, Resorcinol, and sulfate. Thus, visual inspection may not detect exceedances of surface water quality criteria for these compounds in a dissolved phase.*

   EPA Response: EPA agrees that constituent sampling may be necessary to supplement the visual inspection for performance monitoring. However, given that no contaminants have been present in the surface water in the dissolved phase above Pennsylvania's AWQC over 10 years of sampling, some of which occurred prior to the cap being installed, EPA is requiring that first a visible inspection be conducted to determine whether Free Phase Material is present in surface water, then if Free Phase Material is present, EPA will require surface water sampling be conducted and corrective actions taken to address any AWQC exceedances.

   EPA determined that the above procedures are protective of human health and the environment because, as discussed in the Statement of Basis, 10 years of sampling conducted from 2004 to 2014 by Beazer/INDSPEC under oversight by PADEP did not detect any exceedances of the AWQC for volatile organic compounds (VOCs), resorcinol, or the sulfonic acids in surface water. Significantly, many of these sampling events occurred prior to any cap being placed in the Creek and when Free Phase Material was still occasionally appearing in the Creek. Specifically, surface water and Free Phase Material samples were taken from the Creek between August 15, 2005 and August 17, 2005. Although Free Phase Material was present in the Creek during that time, none of the surface water samples exceeded any applicable AWQC.

b. *The proposed remedy relies on source control which may pose an unacceptable risk to public health and the environment, particularly if buildings and existing*

structures are disturbed during redevelopment of the site. In accordance with the Land Recycling and Environmental Remediation Standards Act (35 P.S. § 6026.304(i)), institutional controls alone cannot be used to attain the site-specific standard. Planned future use of the site must be appropriately considered in the development of proposed activity and use limitations. Finally, appropriate assessment of the source has not been done to confirm source stability. Currently, this assessment is based on the evaluation of the appearance of free phase material in the stream, which is subjective and not sufficient for this purpose. Considering the above, the adequacy of source control measures cannot be determined.

EPA Response: EPA agrees that institutional controls alone cannot be used to attain corrective action objectives. For that reason, EPA's proposed remedy relies on engineered controls and monitoring to achieve pathway elimination to control source area releases. In conjunction with the engineered controls and monitoring, the proposed remedy also requires institutional controls to prohibit residential use and require excavation or other construction activities within the capped areas be done in compliance with an EPA-approved Post Remedial Care Plan in order to manage risk that may emerge in demolition and redevelopment activities. EPA will require that the PRCP include procedures that must be followed for intrusive operations so that any such operations will not result in an unacceptable risk to public health and the environment.

With respect to the Free Phase Material, as stated above in response to Comment 2.a., EPA proposes visual inspections as a screening tool to monitor the effectiveness of the cap given the unique nature of the Free Phase Material and its color change properties. A visual inspection standard will allow EPA and PADEP inspectors to instantly evaluate remedy performance. EPA recognizes that surface water sampling for these constituents is a complex task that requires significant planning and specialized sampling and analyses. Nonetheless, surface water and groundwater sampling will be required as part of the Post Remedial Care Plan.

c. *The groundwater-to-surface water model referenced on Page 8 of the Statement of Basis involved particle simulation using assumptions related to the Aquablok® cap that failed in 2013. The model predicted percent (%) reductions in concentrations rather than actual in-stream, predicted concentrations. No documentation was provided to show that all appropriate physical site features that could impact the hydrogeologic properties of the aquifer were considered (e.g., the multilayer stream cap, the old French drain system, the abandonment of the weep ports in the concrete retaining wall, and the impact of the storm water conveyance system.)*

EPA Response: EPA agrees. EPA will remove the reference to the groundwater-to-surface water model. Given the numerous surface water samples collected by Beazer under oversight of PADEP (both pre-cap and post-cap installation), EPA has determined that it is unnecessary to reference modeling to demonstrate attainment of AWQC and that actual sampling results demonstrate attainment. Regarding the impact of physical site features to hydrogeologic properties of the aquifer, the 2005 French drain shutdown study found no significant changes in site hydraulics after the shutdown. Similarly, the January 2016 Hydrology and Hydraulics Analysis submitted to PADEP demonstrated that the proposed engineered cap (including sealing of weep ports) would not adversely affect hydraulic conditions within the Creek channel. Further analysis of any future hydrogeologic changes to the aquifer will be performed as part of the groundwater monitoring plan included in the PRCP.

d. *The proposed remedy relies on prevention of groundwater discharge to the creek via an engineered cap system. However, construction of the engineered system changed hydrogeologic conditions. No ground or surface water sampling has been conducted to evaluate those changes and verify that human health and aquatic water quality criteria are met in the South Branch of Bear Creek. As stated in the previous comment (2.c), the groundwater and particle tracking simulations do not appear to have considered all appropriate hydrogeologic influences, therefore the effectiveness of the multilayer stream cap has not been verified.*

EPA Response: EPA agrees that the cap has changed hydrogeologic conditions in the Creek. EPA's final remedy will require post-installation sampling of groundwater and surface water for at least four quarters to provide more information on any change to hydrogeologic patterns resulting from the engineered system.

e. *Page 6 of the Statement of Basis refers to the "Public Health Assessment for Bear Creek Chemical Area" (Agency for Toxic Substances and Disease Registry, August 2005) to infer that site soil and sediment contamination pose no apparent public health hazard. However, the ATSDR report is not specific to the Beazer/Indspec properties regarding sample data and exposure scenarios. No documentation has been provided to communicate how the ATSDR report was used in the context of exposure pathway assessment, so the Department could not determine if the ATSDR study was used appropriately.*

EPA Response: EPA agrees that the study conducted by Agency for Toxic Substances and Disease (ATSDR) was performed at the Bear Creek Area Chemical Site (BCACS), a sixty-square-mile area that PADEP established under its authority under Pennsylvania's Hazardous Sites Cleanup Act (HSCA), 35 P. S.

§§ 6020.101—6020.1305 and that includes the Facility. EPA presents the findings of that ATSDR study as a prior environmental investigation relevant to the Facility. The ATSDR study used more conservative assumptions (i.e., child receptors, 350 days exposure, and 200 mg/day soil ingested) than would be typical for a site worker (i.e., adult receptors, 250 days exposure, and 100 mg/day soil ingested). In addition, while resorcinol concentrations were higher on-site than the concentrations used in the ATSDR study (735 mg/kg on-site versus 0.3 mg/kg in ATSDR study), using on-site resorcinol concentrations in the ATSDR study would still result in a dose well below the provisional health guideline of 2 mg/kg/day (other specialty compound soil concentrations used in the ATSDR study are comparable to or higher than on-site concentrations). Considering these differences in the ATSDR study and typical exposure scenarios and assumptions in a non-residential setting (which will remain the case at the Facility due to residential use restriction), EPA believes that the inference in the Statement of Basis that soil and sediment contamination at the Facility pose no apparent public health hazard to potential receptors under the assumptions outlined in the proposed remedy is valid.

f. *Surface soil samples collected at the site contain numerous detections of specialty compounds, sulfate, formaldehyde, and other constituents. In some areas, this is related to the historical practice of spraying process water onto the ground to volatilize off constituents. Except for the small, asphalt-capped area covering metals-impacted soil, the proposed remedy does not eliminate complete exposure pathways to these specialty compounds present in surface soils. In accordance with the Land Recycling and Environmental Remediation Standards Act (35 P.S. § 6026.304(i)), institutional controls alone cannot be used to attain the site-specific standard.*

EPA Response: Regarding the specialty compounds listed above, even under more conservative exposure assumptions such as those included in the ATSDR study and using maximum on-site concentrations, provisional health guidelines are not exceeded and no apparent public health hazard exists. Specifically, with respect to formaldehyde, EPA is not aware of any data showing a formaldehyde exceedance in Facility soils nor were any provided by the PADEP. EPA is also unaware of any applicable regulatory standard regarding sulfate concentrations in soil for non-residential use.

g. *The proposed remedy requires soil management planning and personal protective equipment as a means of eliminating exposure pathways related to intrusive activities. The feasibility of implementing such plans site-wide for all intrusive activities is questionable without exposure pathway analysis and a receptor-based approach for each media and receptor in specific areas. In addition, these items would be documented in an Act 2 Final Report and Uniform Environmental*

Covenant as institutional controls. In accordance with the Land Recycling and Environmental Remediation Standards Act (35 P.S. § 6026.304(i)), institutional controls alone cannot be used to attain the site-specific standard.

EPA Response: EPA disagrees, as in our experience, implementing soil management plans and PRCPs has become a practical remedial option at similar sites and at other impacted non-residential Act 2 sites with corrective action obligations. Intrusive activities will only require adherence to the soil management plan in areas where Industrial RSLs in soil or MCLs (or tap water RSLs, or non-residential SHS MSC for resorcinol) in groundwater are exceeded. EPA will provide more specificity regarding these areas in the PRCP, but generally, the soil management plan will cover areas of AOIs 1 and 2 that are capped with asphalt or buildings, and the vegetative cover over the former lagoon in AOI 3.

h. *The proposed remedy does not describe fencing, security personnel, surveillance cameras or other measures to restrict site access, which is the stated basis for the proposed pathway elimination remedial approach. In accordance with the Land Recycling and Environmental Remediation Standards Act (35 P.S. § 6026.304(i)), institutional controls alone cannot be used to attain the site-specific standard.*

EPA Response: As stated in EPA's response to Comment 2.b., above, EPA's Final Remedy consists of engineering and institutional controls to attain EPA's corrective action objectives at the Facility. EPA agrees, and the Final Remedy will require, that the Facility owner should maintain fencing and some form of surveillance in order to restrict Site access.

i. *Numerous groundwater contaminants present at the Facility exceed their applicable Maximum Contaminant Level and/or Statewide Health Standard. The proposed institutional control involves prohibiting groundwater use for potable and/or domestic purposes. This language would allow groundwater to be used for industrial or other purposes, which provides complete exposure pathways (e.g., dermal contact, incidental ingestion, inhalation). Groundwater use should be prohibited for all purposes or these exposure routes should be evaluated as part of a quantitative risk assessment as this pathway is complete.*

EPA Response: EPA agrees. The groundwater from the intermediate and deep groundwater aquifers (wells are from 100 to greater than 300 feet bgs) at the Facility is used as cooling and process makeup water. Those aquifers have been sampled and shown not to contain COCs above their respective MCLs. EPA has clarified that the shallow groundwater at the Facility may not be used for any purpose.

j. *The 2012-2013 remedial investigations included collection of a limited number of soil gas and air samples to evaluate the potential for vapor intrusion into occupied buildings. There were exceedances of EPA's industrial air screening levels for numerous constituents. The proposed remedy relies on maintenance of positive pressure and an alarm system in existing, occupied buildings, without listing the buildings that would be subject to the engineering controls. The proposed remedy does not specify how these measures would be monitored and maintained.*

   EPA Response: Only ambient air samples were taken as part of the vapor intrusion investigation; EPA assumes PADEP was referencing the soil gas concentrations that exceeded the commercial soil gas to indoor air screen for certain contaminants within the VISL calculator. Due to the high groundwater table, sub-slab depressurization systems were deemed impractical; therefore, maintenance of positive pressure in occupied buildings within the impacted area is required. Specific details for monitoring and maintenance will be outlined in the PRCP.

3. Comment: *The statement on page 5 of the Statement of Basis that the French drain groundwater pump and treat collection system "was permanently shut down after reportedly receiving approval from PADEP to do so" is incorrect. PADEP was informed of a temporary, 60-day shutdown of the system. However, PADEP is not aware of any approval of a permanent shutdown.*

   EPA Response: Please see response to Mr. Al Randall's comment 2, above.

4. Comment: *Contrary to the statement on page 5 of the Statement of Basis, Local ordinances regarding mandatory connection to a public water system vary. Most local ordinances require connection to a public water system, but not all prohibit continued groundwater use.*

   EPA Response: EPA agrees. EPA has revised that statement to read "PADEP also created a model ordinance, which was passed in each municipality within the BCACS, that prohibits potable groundwater use after obtaining a mandatory hookup to the public water supply in order to prevent residential use of impacted portions of the aquifer." The prohibition on groundwater use is in accordance with Section 6(b) of the ordinance; all nearby municipalities within the BCACS that EPA is aware of used this model language in their local ordinances.

5. Comment: *The proposed engineering controls and institutional controls listed in the Statement of Basis are not derived from a risk assessment, remedial alternatives analysis or confirmatory sampling, meeting Act 2 standards. In accordance with the Land*

Recycling and Environmental Remediation Standards Act (35 P.S. § 6026.304(i)), institutional controls alone cannot be used to attain the site-specific standard.

EPA Response: EPA agrees that its proposed remedy was not derived from a risk assessment. Rather, EPA relied upon the pathway elimination standard pursuant to Act 2, 25 PA Code 250.404.

6. Comment: *Post remedy surface water visual inspections should include the entire length of the South Branch of Bear Creek within AOIs 1 and 3 in perpetuity due to release history (including lower fabrication shop) and changes in hydrogeologic conditions created by the cap. Any Post Remediation Care Plan should be specific about the frequency of inspections, who will conduct them, and procedures for correcting non-attainment.*

   EPA Response: EPA agrees and has included in the Final Remedy requirements for visual inspection of the entire length of the Creek within the Facility boundary and will require additional information, such as those mentioned in the comment, in the PRCP.

7. *Comment: Section 7: "Financial Assurance" does not propose financial assurance sufficient to repair and replace the engineering control in AOI 3, where the lagoon was closed and rip-rap was placed to stabilize the creek bank.*

   EPA Response: EPA agrees and has included in the Final Remedy the requirement to provide Financial Assurance for the former lagoon closure.

8. *Comment: Section 7: "Financial Assurance" only proposes sufficient financial assurance to repair the replacement engineered cap within the stream in the event of flood damage. Given the previous failure of the engineered cap, financial assurance should be based upon the cost of replacement.*

   EPA Response: Given the robust nature of the current engineered cap, EPA had determined that it would be highly unlikely that the new cap would be damaged to the extent that it would need to be replaced completely. Nonetheless, EPA has added replacement cost of the engineered cap to the FA requirement.

9. Comment: *The Statement of Basis does not contemplate permanent closure of groundwater monitoring wells, the French Drain collection system at the Facility or financial assurance for these items.*

   EPA Response: EPA has included in the Final Remedy the requirements for French Drain and monitoring well closures, and financial assurance for those items.

10. Comment: *Butler County deed records show "Specialty Acquisition Sub, Inc." as the owner of tax parcels on which AOIs 1, 2, and 4 are located. Imposition of engineering controls and institutional controls on these parcels will require consent of the landowner.*

    EPA Response: EPA agrees. While EPA prefers to have a landowner consensually implement use restrictions, EPA may also consider using its enforcement authorities to implement the restrictions where appropriate to protect human health and the environment.

Additional comments related to the Facility but not directly related to the proposed remedy were also discussed at the public meeting. Those comments are not summarized in this Response to Comments given that they did not relate to the proposed remedy.