967741

Record of Decision Amendment

Reilly Tar and Chemical Site
Indianapolis
Marion County, Indiana

U.S. Environmental Protection Agency
Region 5

August 2021

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List of Acronyms

AOC	Administrative Order on Consent
AR	Administrative Record
ARAR	Applicable or Relevant and Appropriate Requirements
BGS	Below Ground Surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EJ	Environmental Justice
ELCR	Excess Lifetime Cancer Risk
EPA	U.S. Environmental Protection Agency
ERC	Environmental Restrictive Covenant
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
FYR	Five-Year Review
HI	Hazard Index
IAC	Indiana Administrative Code
IC	Institutional Control
IDEM	Indiana Department of Environmental Management
MCL	Maximum Contaminant Level
mg/L	Milligrams per Liter or ppm
MNA	Monitored Natural Attenuation
NCP	National Contingency Plan
NPL	National Priorities List
OU	Operable Unit
POTW	Publicly Owned Treatment Works
PRP	Potentially Responsible Party
ppb	parts per billion
ppm	parts per million
PW	Pumping Well
RAO	Remedial Action Objective
RG	Remediation Goal
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SVE	Soil Vapor Extraction
µg/L	Micrograms per Liter or ppb
UU/UE	Unrestricted use/unlimited exposure
U.S.C.	United States Code
VI	Vapor Intrusion

ROD Amendment - Operable Unit 1
Reilly Tar & Chemical Superfund Site
Indianapolis, Indiana

I. DECLARATION

A. Site Name and Location

The Reilly Tar & Chemical Site (Site) is located at 1500 South Tibbs Avenue in the southwest quadrant of Indianapolis, Indiana. Minnesota Street divides the 120-acre Site into 2 parcels. The Oak Park property, which occupies approximately 40 acres, is located north of Minnesota Street and is the location of current specialty chemical manufacturing operations. The Maywood property, which occupies approximately 80 acres, is located south of Minnesota Street and was the location of wood preserving operations from 1921-1972.

B. Statement of Basis and Purpose

This decision document amends the 1992 Operable Unit (OU) 1 Record of Decision (ROD) for the Site and explains the factual and legal bases for amending the selected remedy. This ROD Amendment was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 United States Code (U.S.C.) §§ 9601 *et seq.*, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (C.F.R.) Part 300, as amended. Specifically, this decision document has been prepared in compliance with CERCLA Section 117 and the NCP at 40 C.F.R. § 300.435(c)(2)(ii).

This document is issued by EPA, the lead agency for Site activities. The Indiana Department of Environmental Management (IDEM), the support agency, concurs with this amended remedy. The information supporting EPA's decision on the amended remedy is contained in the Administrative Record (AR) file for the Site, which has been developed in accordance with Section 113(k) of CERCLA, 42 U.S.C. § 9613(k), and the NCP at 40 C.F.R. § 300.825(a)(2). This Administrative Record file is available for review by the public at the Indianapolis Public Library, 40 E. St. Claire Street, Indianapolis, Indiana (Hours: Monday – Friday, 10 am – 5 pm) and at the EPA Region 5 Office, 7th Floor Record Center, 77 W. Jackson Blvd., Chicago, Illinois (Hours: Monday – Friday, 8 am – 4 pm). The AR Index (Appendix A) identifies each of the items comprising the Administrative Record upon which this ROD Amendment is based.

C. Assessment of Site

The response action selected in this ROD Amendment is necessary to protect public health or welfare or the environment from actual or threatened releases of pollutants or contaminants from this Site that may present an imminent and substantial endangerment to public health or welfare.

D. Description of the Amended Remedy

This ROD Amendment modifies the groundwater remedy from pump-and-treat to barrier biosparging, which would include a permanent shutdown of the current groundwater extraction and treatment system once the biosparging system is fully operational and achieving the design objectives. The remedial action objectives (RAOs) for this amended remedy are the same as for the current pump-and-treat remedy.

E. Statutory Determination

The amended remedy for the Site is protective of human health and the environment, complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action (RA), is cost effective, employs permanent solutions to the maximum extent practicable and utilizes alternative treatment technologies to the maximum extent practicable.

Because Site remedies resulted in hazardous substances, pollutants or contaminants remaining on-Site above levels that allow for unlimited use and unrestricted exposure (UU/UE), Site-wide statutory reviews are necessary to ensure that the remedy continues to be protective of human health and the environment. EPA conducted five-year reviews (FYRs) at the Site in 2000, 2005, 2010, 2015 and 2020. The most recent FYR was completed on February 3, 2020.

F. ROD Data Certification Checklist

The following information is included in the Decision Summary (Part II) of this ROD Amendment. Each item below is followed by a referenced location in this document. Additional information can be found in the administrative record file for the Site.

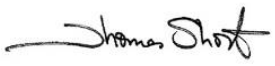
- Contaminants of concern (COCs) and their respective concentrations (Section 5)
- Baseline risk represented by the COCs (Section 7)
- Cleanup levels established for COCs and the basis for these levels (Section 8)
- Current and reasonably anticipated future land use assumptions, and current and potential future beneficial uses of groundwater used in the Baseline Human Health Risk Assessment and this ROD Amendment (Section 6)
- Potential land and ground water use that will be available at the Site as a result of the Amended Remedy (Section 6)

- Estimated capital, lifetime operation and maintenance (O&M), and total present worth costs; discount rate; and the number of years over which the remedy cost estimates are projected (Section 10)
- Key factors that led to amending the remedy (Section 4)

G. Authorizing Signature

This ROD Amendment documents a fundamental change to the remedy selected in the June 1992 ROD. This Amendment was developed by EPA, with the assistance of IDEM. The Director of the Superfund & Emergency Management Division (EPA, Region 5) has been delegated the authority to approve this decision document. IDEM concurs with this ROD Amendment. Its letter of concurrence will be added to the Administrative Record upon receipt.

8/19/2021

X  *for*

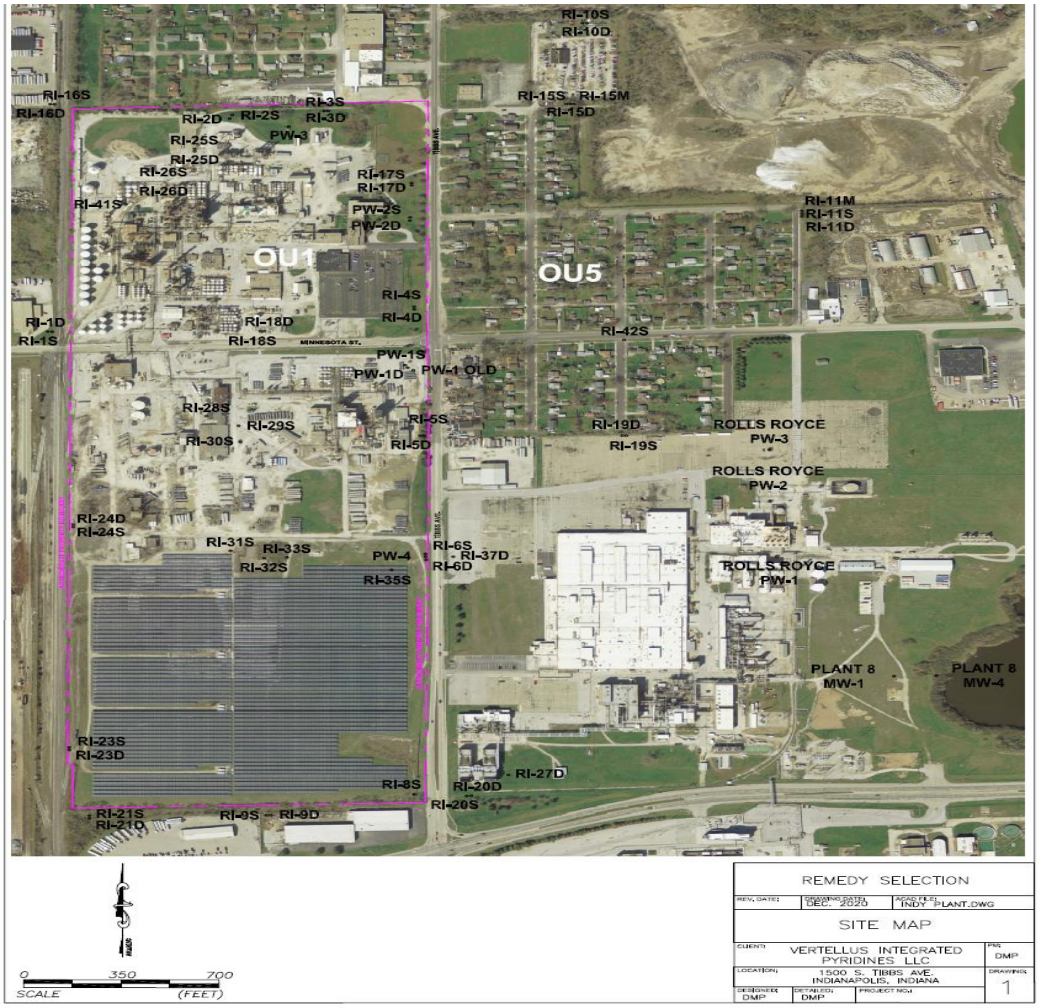
Douglas Ballotti, Director
Superfund & Emergency Management Division
Signed by: Environmental Protection Agency

II. DECISION SUMMARY

1.0 Site Name, Location, and Description

The Reilly Tar & Chemical Site is located at 1500 South Tibbs Avenue in the southwest quadrant of Indianapolis, Indiana. Minnesota Street divides the 120-acre Site into 2 parcels. The Oak Park portion of the property, which occupies approximately 40 acres, is located north of Minnesota Street. The Maywood portion of the property, which occupies approximately 80 acres, is located south of Minnesota Street and was the location of wood preserving operations from 1921-1972 (See Figure 1). The Site is divided into five operable units (OUs) and each has a cleanup remedy that has been implemented. OU1 (on-Site) and OU5 (off-Site) address groundwater and OU2, OU3, and OU4 consist of on-Site source control remedies.

Figure 1 Site Map



The Site contains an active chemical manufacturing facility, and the majority of the operating facility buildings are located north of Minnesota Street. Approximately 75% of the Oak Park property is covered by buildings, pavement, and above-ground tank farms. Chemical manufacturing and wastewater treatment is also conducted on the northern portion of the Maywood Property. In 2014, A 45-acre solar farm was constructed on a portion of the southern portion of the Site, which is known as the "Kickback Area" (OU3) (See Figure 1).

Residential neighborhoods are located to the north and east of the Oak Park property. All residences are connected to the municipal water supply pursuant to a Marion County ordinance. Other commercial and industrial properties are located west, south, and southeast of the Site.

In 2021, EPA completed an environmental justice (EJ) analysis using the EJSCREEN tool. Based on the results of this screening, there is a high potential for EJ concerns in the area near the Site (See Attachment B). EPA will continue to conduct additional outreach which is intended to maximize the ability of local citizens to voice comments or concerns with proposed Site remedial actions.

2.0 Site History and Enforcement Activities

2.1 Site History

Industrial development of the Site began in 1921 when Republic Creosoting Company started a coal tar refinery and a wood treatment operation on the southern end of the property. On-site wood treatment operations occurred from 1921 to 1972. Specialty chemical operations began on the northern end of the Site in the early 1950s and have continued since that time.

In 1987, the potentially responsible party (PRP) agreed to conduct a Remedial Investigation and Feasibility Study (RI/FS) at the Site under an administrative order on consent (AOC). The RI/FS was completed during the early 1990s. Five OUs were created, and each has a cleanup remedy that has been implemented. OU1 (on-Site) and OU5 (off-Site) address groundwater. OU2, OU3, and OU4 consist of on-Site source control remedies that have long-term inspection and maintenance activities which are conducted in accordance with the requirements of a subsequent consent decree (CD).

2.2 Corporate History

Republic Creosoting Company:	January 1905 – January 1961
Reilly Tar and Chemical Corporation:	January 1961 – January 1989
Reilly Industries Inc.:	January 1989 – July 2006
Vertellus Specialties Inc.:	July 2006 – approx. February 2017
Vertellus Integrated Pyridines LLC:	Approx. February 2017 – present

2.3 Environmental Investigation and Enforcement Activities

In 1987, the PRP began the RI to characterize the nature and extent of contamination at the Site. This investigation was continued in 1992 to study additional Site areas, pursuant to the terms of an amendment to the AOC. The RI outlined soil and groundwater contamination consisting of volatile organic compounds (VOCs) and other chemicals.

In June 1992, EPA signed a ROD for OU1 that selected an interim groundwater remedy to contain the contaminant plume at the Site boundary through groundwater extraction with discharge to an off-property Publicly Owned Treatment Works (POTW). The interim remedy also included groundwater monitoring to ensure containment goals were met. The 1992 ROD required institutional controls (ICs) that restricted future development of the Site area, prohibited the installation of groundwater drinking water wells, and created an isolation zone surrounding the property.

EPA signed a ROD for OU2 in September 1993 that selected excavation and on-Site thermal desorption for soils with VOC contamination in four areas on the property. In-situ solidification of sludge material in an area on the southern end of the property was also selected in the ROD with placement of a soil cover over the solidified material. EPA signed an Explanation of Significant Differences (ESD) in October 1997, changing the on-Site thermal desorption remedy to off-property thermal treatment due to on-Site treatment issues. The ROD also included backfill of the excavated areas and restoration including either soil, gravel, or asphalt covers. The ROD included ICs for limiting future Site use to industrial and included access restrictions to restrict exposure to contaminated areas.

In September 1997, EPA signed a ROD for OU3 and OU4 that selected a permeable soil or gravel cover over the Kickback Area at the southern portion of the Site (OU3) and installation of a concrete cover and soil vapor extraction (SVE) system to remediate VOC contamination in soil in the North Process Area (OU4). The ROD also included ICs to maintain the installed remedy covers and to restrict future use to industrial.

In June 1997, EPA signed a ROD for OU5 that selected monitored natural attenuation (MNA) for areas of off-property groundwater contamination. This ROD also finalized the interim OU1 perimeter groundwater extraction system implemented as part of the 1992 groundwater ROD to continue to contain further migration of groundwater contaminated by the Site and finalized the cleanup goals from the OU1 ROD.

The OU5 ROD stated that the ICs already established at the Site included a control prohibiting the Site owner/operator from using the groundwater underlying the property. This IC was upgraded to an environmental restrictive covenant with the new owner/operator Vertellus Specialties, Inc. in 2012. This control allows Vertellus to use the groundwater under the Site for industrial purposes (non-contact cooling water) only after obtaining the express written approval of EPA, or any successor federal governmental department or agency. This control that prohibits use of the groundwater underlying the Site shall continue in full force until the Site is deleted

from the National Priorities List (NPL), all remedial action cleanup and performance standards are met, and until such time as the EPA issues a determination in writing or the federal district court issues a ruling to either modify or terminate the restrictions in response to a petition from the owner(s) of the property.

Three CDs have been negotiated and entered for the design and implementation of cleanup remedies at all five OUs at the Site.

Institutional Controls:

The three CDs entered for the Site require implementation of the remedies selected in the RODs and contain specific IC requirements for access, conducting IC evaluation activities (such as title work), and the implementation and recording of approved IC instruments (restrictive covenants). On February 13, 2012, Vertellus Specialties Inc. signed and recorded a Declaration of Environmental Restrictive Covenant (ERC) to restrict future uses of the Site. The ERC was approved as being enforceable and providing long term protectiveness at the Site in both form and content by EPA, the Department of Justice, and IDEM before it was recorded.

The following restrictions are in place at the Site:

- No excavation in the area of the caps
- Residential use of the Site is prohibited
- On-Site excavations are prohibited
- Interference with remedy components is prohibited unless prior written approval is obtained from EPA
- A certified copy of the consent decrees is recorded
- A notice of obligation to provide Site access is recorded
- Use of groundwater under the Site is prohibited until cleanup standards are met

3.0 Community Participation

Public participation requirements under CERCLA Sections 113(k)(2)(B)(i-v) and 117 were satisfied during the RI/FS process. EPA has been primarily responsible for conducting the community involvement program for this Site, with the assistance of IDEM. The following public participation activities, to comply with CERCLA, were conducted during the RI/FS.

A community involvement plan was developed to assess the community's informational needs related to the Site and to outline community involvement activities to meet these needs. Residents and community officials were interviewed, and concerns were incorporated into this plan.

A public information repository was established at the Indianapolis/Marion County Public Library-Central Branch. An initial mailing list of interested citizens, organizations, news

media, and elected officials in local, county, State and Federal government was developed. This mailing list has been updated periodically as interested individuals have approached EPA for information.

Fact Sheets and other information regarding Site activities have been mailed periodically, summarizing activities at the Site and including notifications of public meetings or availability sessions for project progress discussions, projected sampling at the Site with sampling results, upcoming Site milestones, and EPA's proposed plan meetings for the five Site OUs.

EPA has previously placed advertisements in the *Indianapolis Star* announcing Agency meetings and requests for public input on remedy proposals.

Few community involvement activities have been conducted recently except for those required under FYRs conducted in 2000, 2005, 2010, 2015, and 2020. This involved notifying the public via the *Indianapolis Star* that a public comment period for the FYR report was commencing, and when the FYR was complete.

On June 3, 2021, EPA announced the Proposed Plan to amend the 1992 ROD in the *Indianapolis Star*. The public comment period ran from June 3, 2021 to July 2, 2021. The announcement invited the public to attend a virtual proposed plan meeting that EPA held on June 15, 2021.

4.0 Scope and Role of Response Action

This ROD Amendment makes a fundamental change to the groundwater remedy originally selected and implemented at the Site in the 1992 ROD for OU1. The remedy change is described in more detail in Section 12 (Selected Remedy).

5.0 Site Characteristics

5.1 Regional Setting

The Site lies within the White River drainage basin, located approximately three miles to the east. Eagle Creek is an attendant tributary and flows in a southeasterly direction approximately 4000 feet to the east of the Site. Topography in the Site area is relatively flat with a gentle downward slope in an easterly direction. Other surface-water bodies in the Site area include Blue Lake (a former gravel pit) located approximately 2000 feet northeast of the Site, several small ponds or surface-water impoundments located 2000 to 4000 feet east of the Site, and one surface-water impoundment located immediately southwest of the Maywood property. The westernmost extension of Blue Lake has been filled in since 1979.

5.2 Site Geology

The sand and gravel deposits that underlie almost all of the White River drainage basin form the principal aquifer in the area. In the vicinity of the Site, upper and lower zones have been identified within the sand and gravel outwash aquifer. At some locations, especially directly underneath the Site, these zones are separated by one or more till units which, because of their silt content, are less permeable layers and may impede flow vertically. The lack of a continuous fine unit and similar ground-water levels in shallow and deep wells suggest that the upper and lower zones of the outwash sand and gravel deposits are hydraulically connected and that the till units do not act as a barrier to downward contaminant flow in ground water.

Regional hydrogeologic data indicate that ground water in the unconsolidated material in the area of the Site flows east towards Eagle Creek with a southerly component. Water level data from the RI indicate that ground-water flow is generally from the northwest to the southeast and that withdrawals from the neighboring industrial production wells significantly impact the flow of groundwater east of the Site. Hydraulic conductivities for wells tested during the RI range from 10^{-2} to 10^{-3} centimeters per second. An average linear ground-water velocity of 0.68 feet per day was calculated for the area that is not influenced by the industrial pumping to the east of the Site. An average linear groundwater velocity of 2.0 feet per day was calculated for the area that is influenced by the industrial pumping.

5.3 Site Hydrogeology

The sand and gravel deposits that underlie the White River drainage basin form the principal aquifer in the area. In the vicinity of the Site, shallow, medium, and deep aquifer zones have been identified. The three aquifer zones are not always present or laterally continuous in all areas of OU1 and OU5.

OU1 and OU5 Shallow Aquifer System

The shallow sand and gravel aquifer is present everywhere in OU1 and OU5 and is typically underlain by finer grained soils. The finer grained soils contain silt and/or clay that can be mixed with sand and/or gravel. Monitoring wells in the shallow aquifer are typically screened in the range of approximately 25-35 feet below ground surface (bgs). Pumping wells PW-1S and PW-2S are screened in the shallow aquifer along with perimeter wells RI-4S, RI-6S, and RI-17S. The ground surface in this area is approximately 700 feet above mean sea level (msl). The lower permeability soils beneath the shallow aquifer are typically present and beginning at an elevation of approximately 670 feet msl in OU1 and OU5 although some anomalies and variations do exist. Instances of continuous sand and gravel formation (i.e., no lower permeability soils) include areas around well locations RI-2, PW-3, RI-6, RI-20, and RI-19.

OU1 *Deep and OU5 Medium Aquifer System*

A deep aquifer underlies the shallow aquifer in OU1. The deep aquifer in OU1 is laterally continuous with the aquifer zone identified as the medium aquifer in OU5. Wells in the OU1 deep aquifer and OU5 medium aquifer are generally screened in the range of 40-60 feet bgs. OU1 perimeter wells in the deep zone include RI-4D, RI-5S, RI-6D, and RI-17D. Pumping well PW-1D is also screened in this zone. OU5 wells in this zone include RI-11M, RI-15M and RI-19D.

OU5 Deep Aquifer System

A deep aquifer underlies the medium aquifer in OU5. Monitoring wells in the OU5 deep aquifer are typically screened in the range of approximately 80 to 110 feet bgs and include wells RI-11D and RI-15D. OU1 perimeter well RI-5D and the OU5 Rolls-Royce facility's production wells are also screened in the deep aquifer.

Bedrock System

Bedrock underlies the sand and gravel and till deposits and its elevation varies. In the northern portion of OU1, the depth to bedrock varies from approximately 45 feet to 60 feet bgs. In the area of PW-2 and RI-17 the depth to bedrock is approximately 50 feet bgs. Bedrock is approximately 90 to 100 feet bgs in the vicinity of RI-5 and RI-6. In OU5, bedrock is generally 100 to 120 feet bgs. A rise in the bedrock elevation has been identified in OU5, which pinches out the deep aquifer in the area of RI-19 and former RI-42.

Groundwater Pumping Conditions

Shallow groundwater level data has been measured while currently pumping from PW-1S and PW-2S, which are in place to provide groundwater containment as required by the OU1 ROD. Groundwater levels in the shallow and deep aquifers suggest a slight downward gradient. Medium and deep groundwater level data has been measured while pumping from PW-1D. In addition, nearby groundwater production wells are actively pumped and impact the direction of groundwater flow. The nearby Rolls-Royce facility, located southeast of the Site, extracts groundwater from three high-capacity wells and uses the extracted groundwater as non-contact cooling water for their operations. The closest Rolls-Royce well is located approximately 1,200 feet east of the Site.

Olin Brass previously maintained a high capacity well field on the west side of Eagle Creek and south of Minnesota Avenue, which influenced regional groundwater flow. The Olin Brass well field was located approximately 2,400 feet east of the Site, ceased operation in 2007, and the wells were abandoned in March 2007. In general, the sand and gravel formations in OU1 are less thick and less permeable than those in OU5. Pumping from OU1 wells PW-1S, PW-2S, and PW-1D is significantly impacted by the operation of Rolls-Royce production wells, located east of the Site.

5.4 Nature and Extent of Contamination

Groundwater in OU1 and OU5 has been impacted by benzene, pyridines, and ammonia. These compounds have impacted the shallow and deep aquifers on-Site in OU1, and the shallow, medium, and deep aquifers off-Site in OU5, as measured most recently in 1Q2020. The following figures show the progress of the groundwater cleanup from 1991 to 2020 for shallow and deep groundwater concentrations for benzene, pyridine, and ammonia. The existing OU1 remedy has made substantial progress towards remediation goals (RG), but exceedances of RGs remain, both on- and off-Site.

Figure 2 Benzene Shallow Aquifer 1991

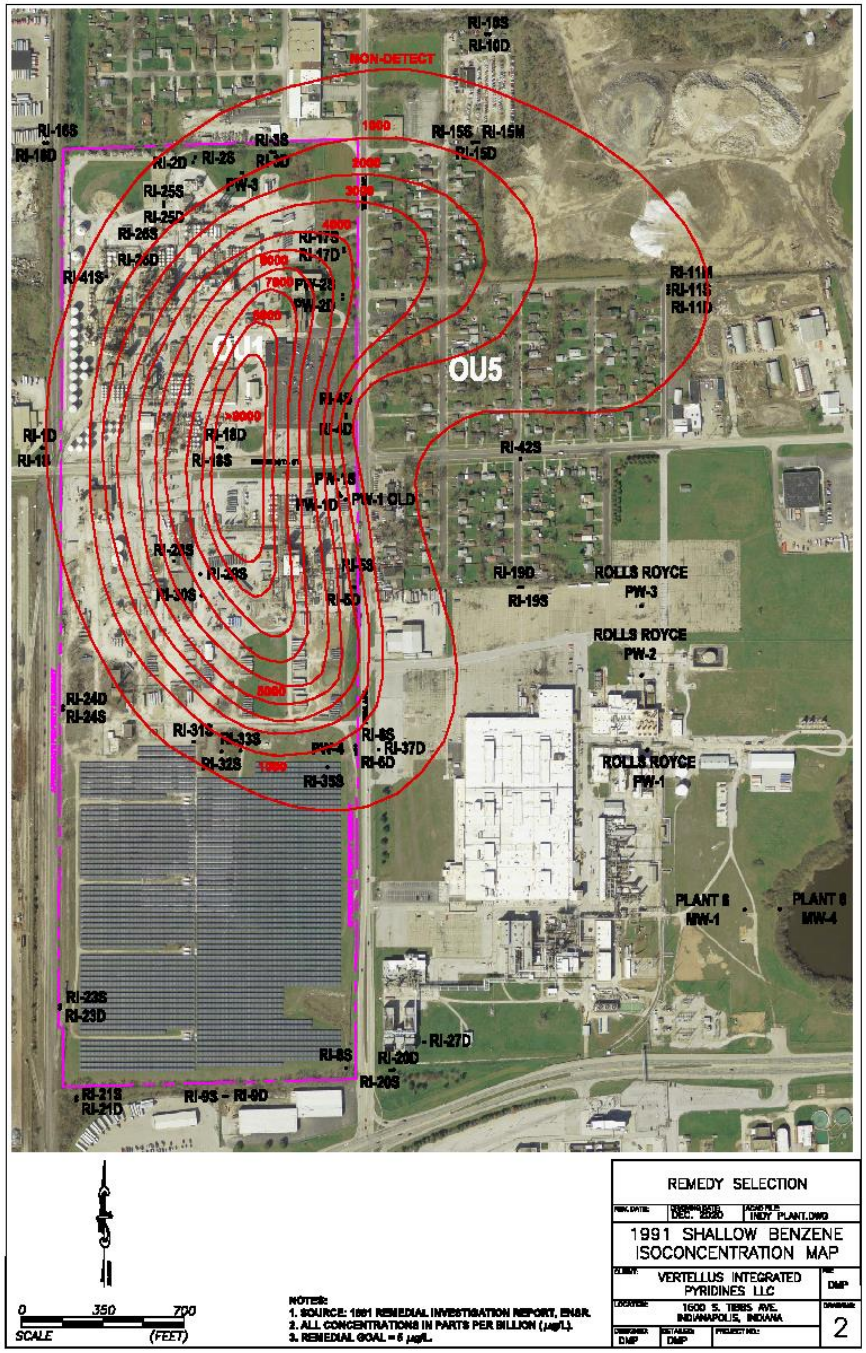


Figure 2 Benzene Shallow Aquifer 2020

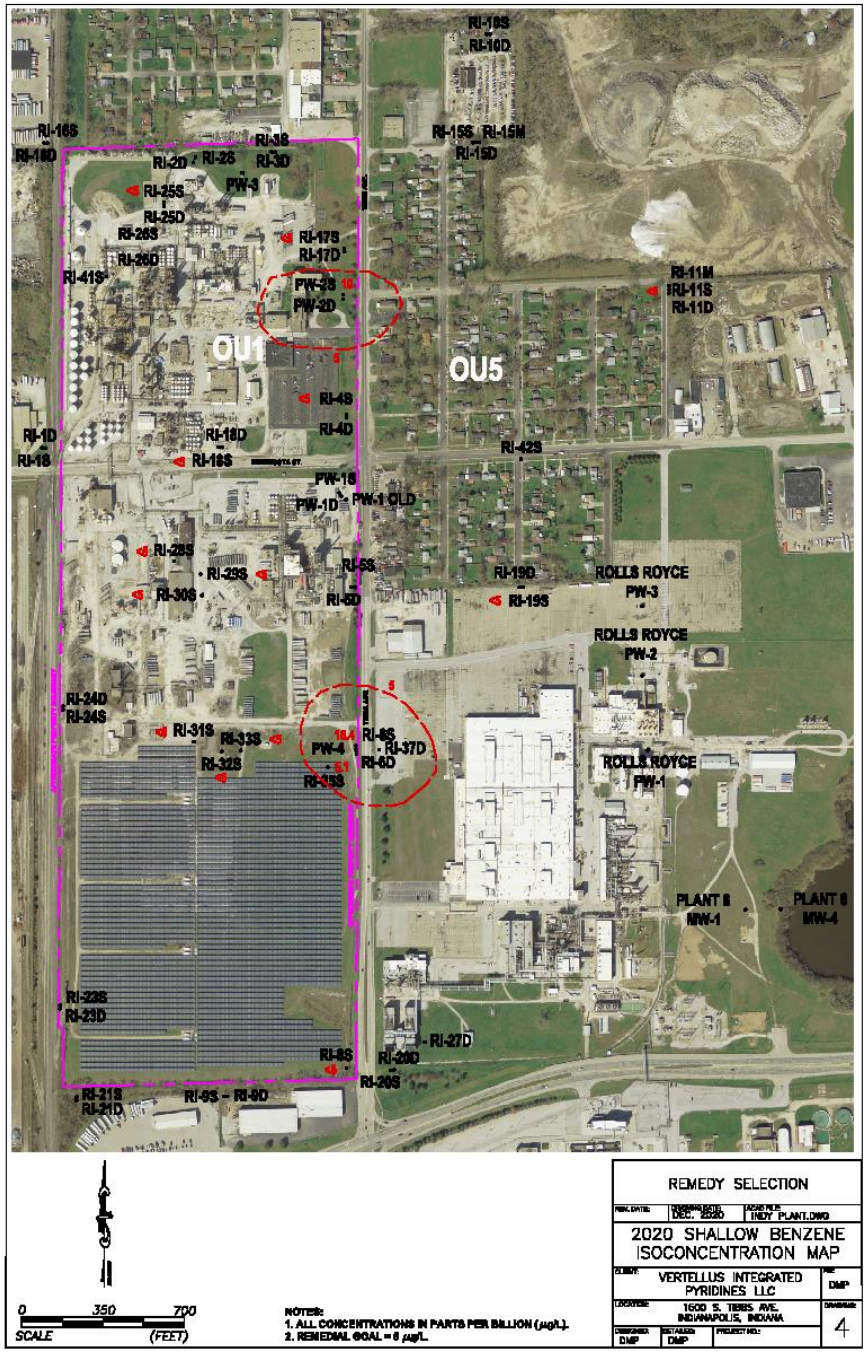


Figure 3 Pyridine Shallow Aquifer 1991

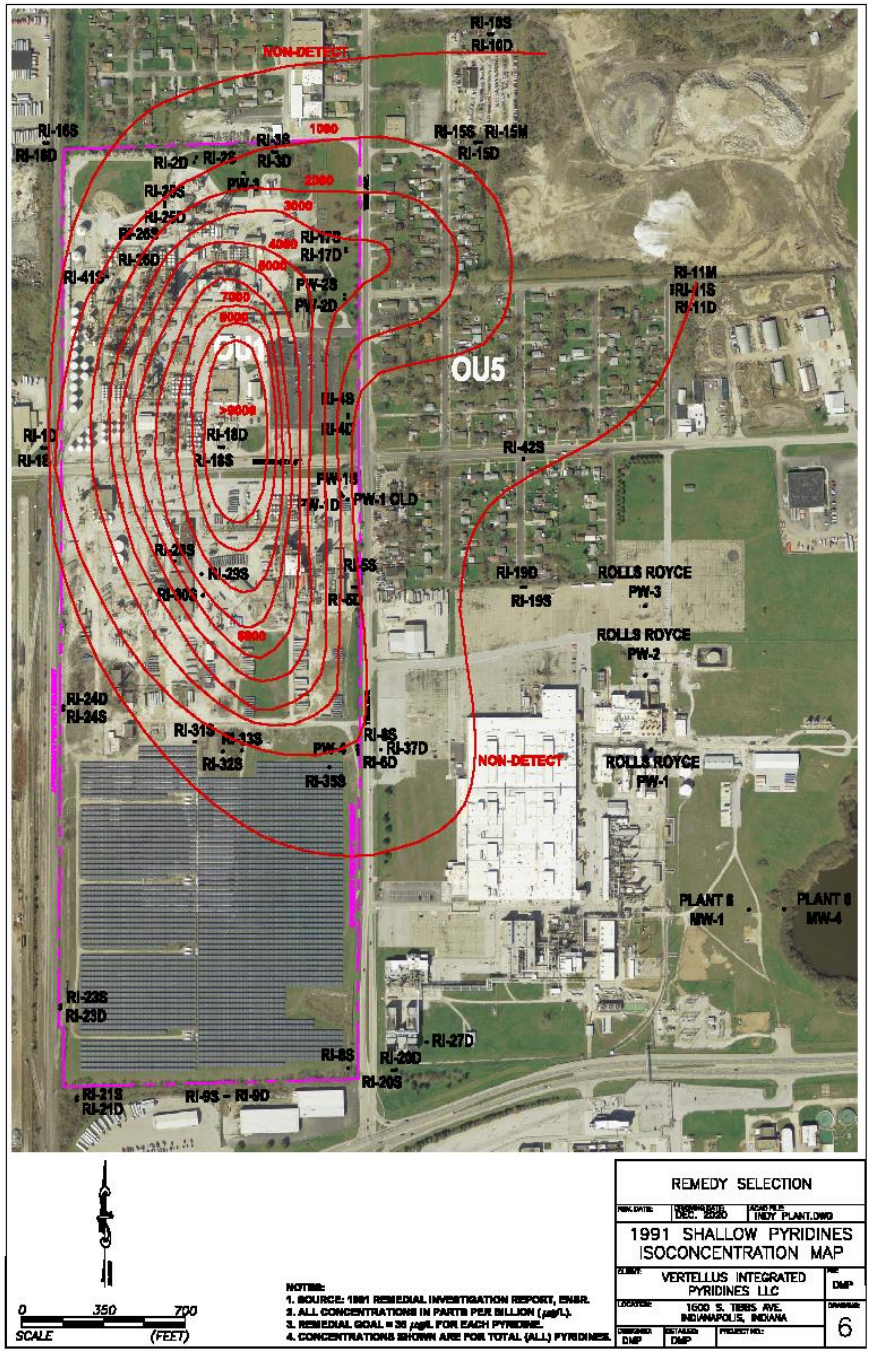


Figure 3 Pyridine Shallow Aquifer 2020

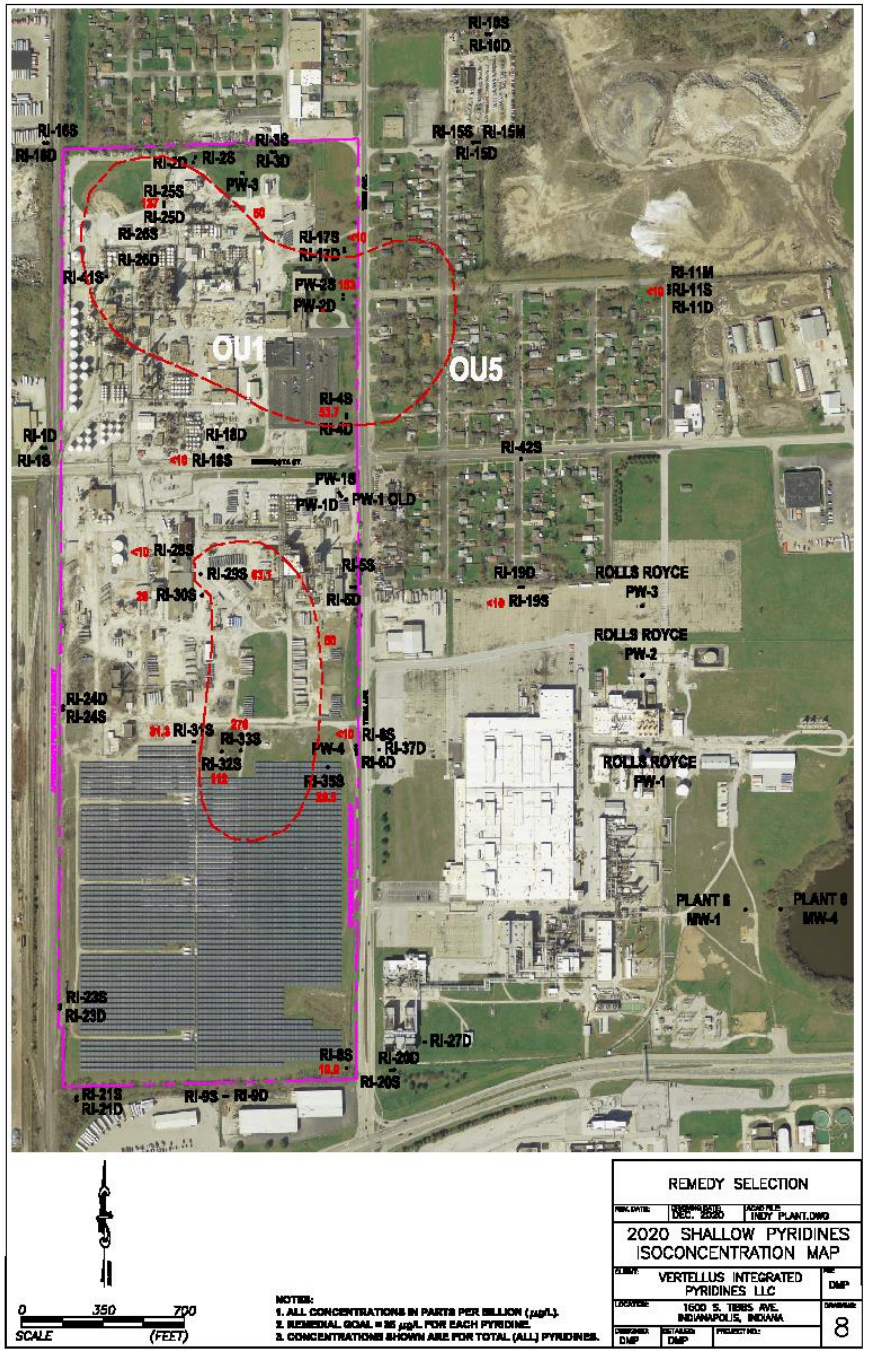


Figure 4 Ammonia Shallow Aquifer 1991

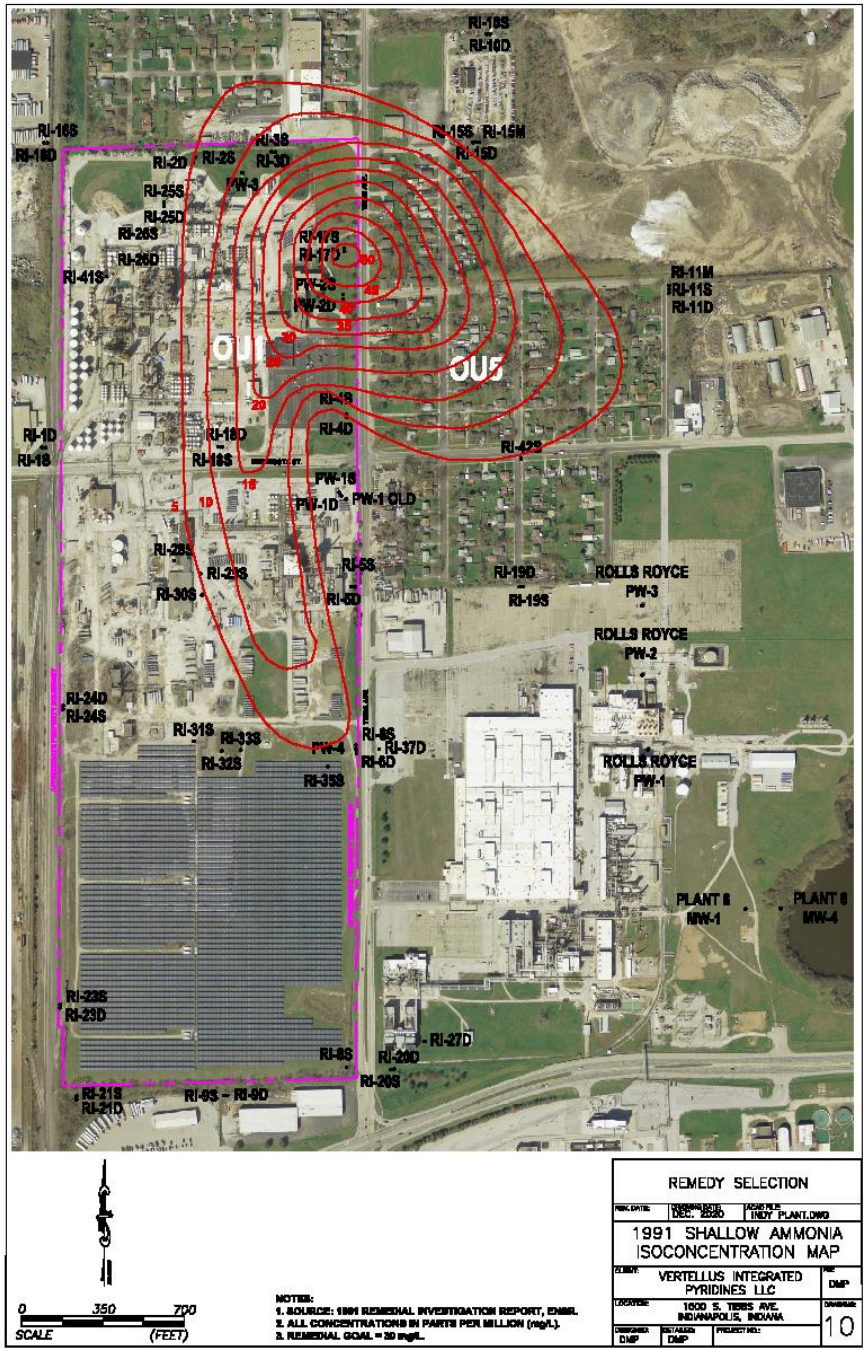


Figure 4 Ammonia Shallow Aquifer 2020

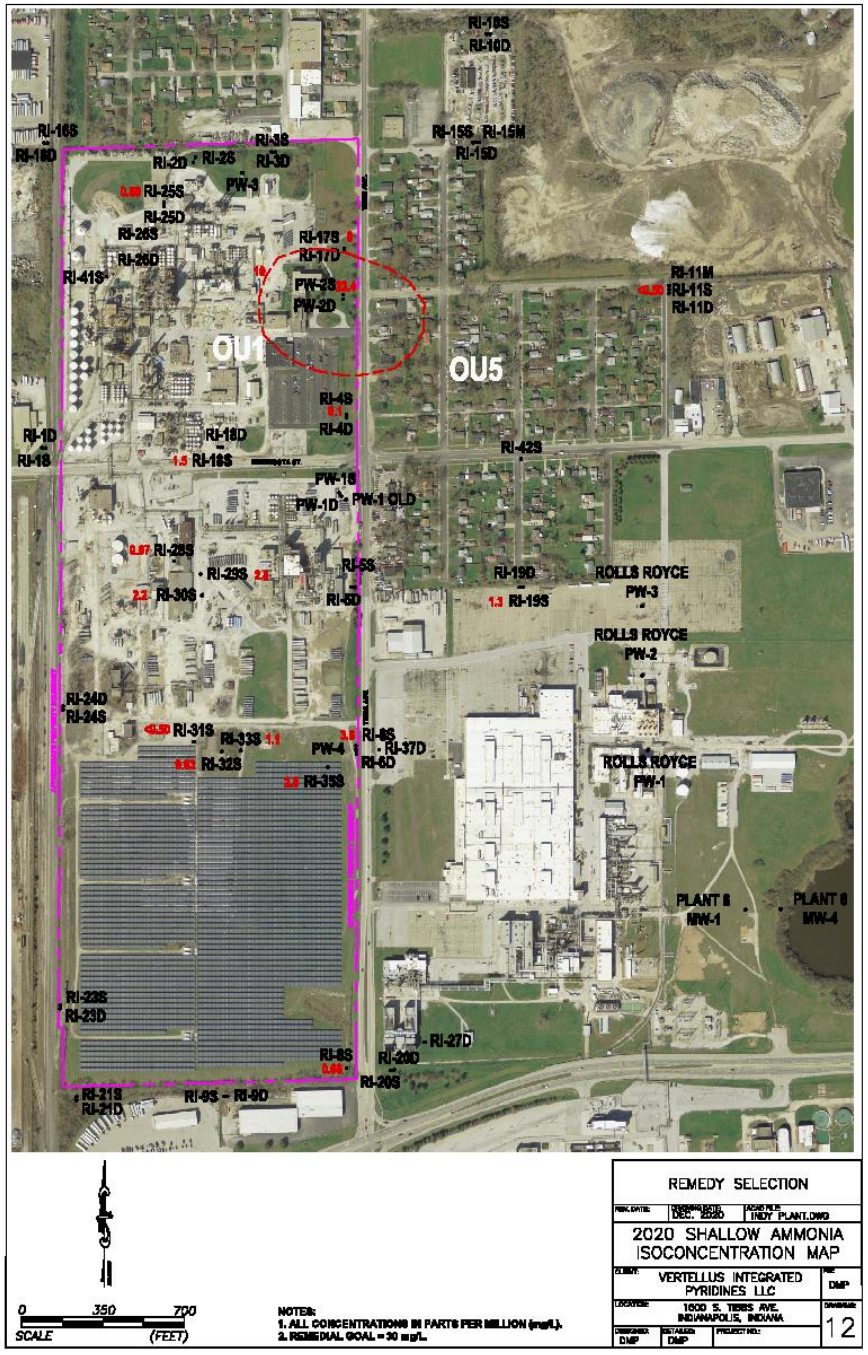


Figure 5 Benzene Deep Aquifer 1991

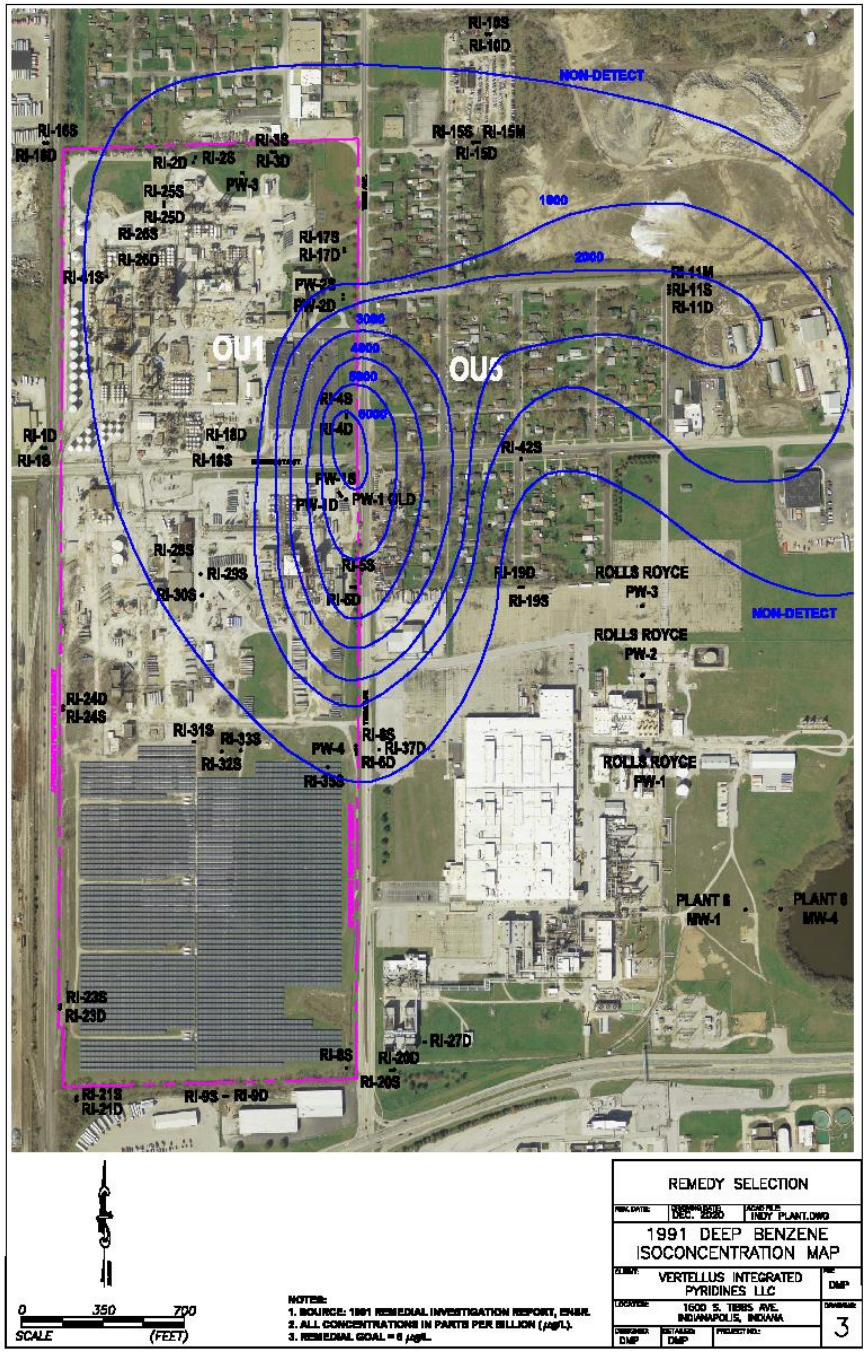


Figure 5 Benzene Deep Aquifer 2020

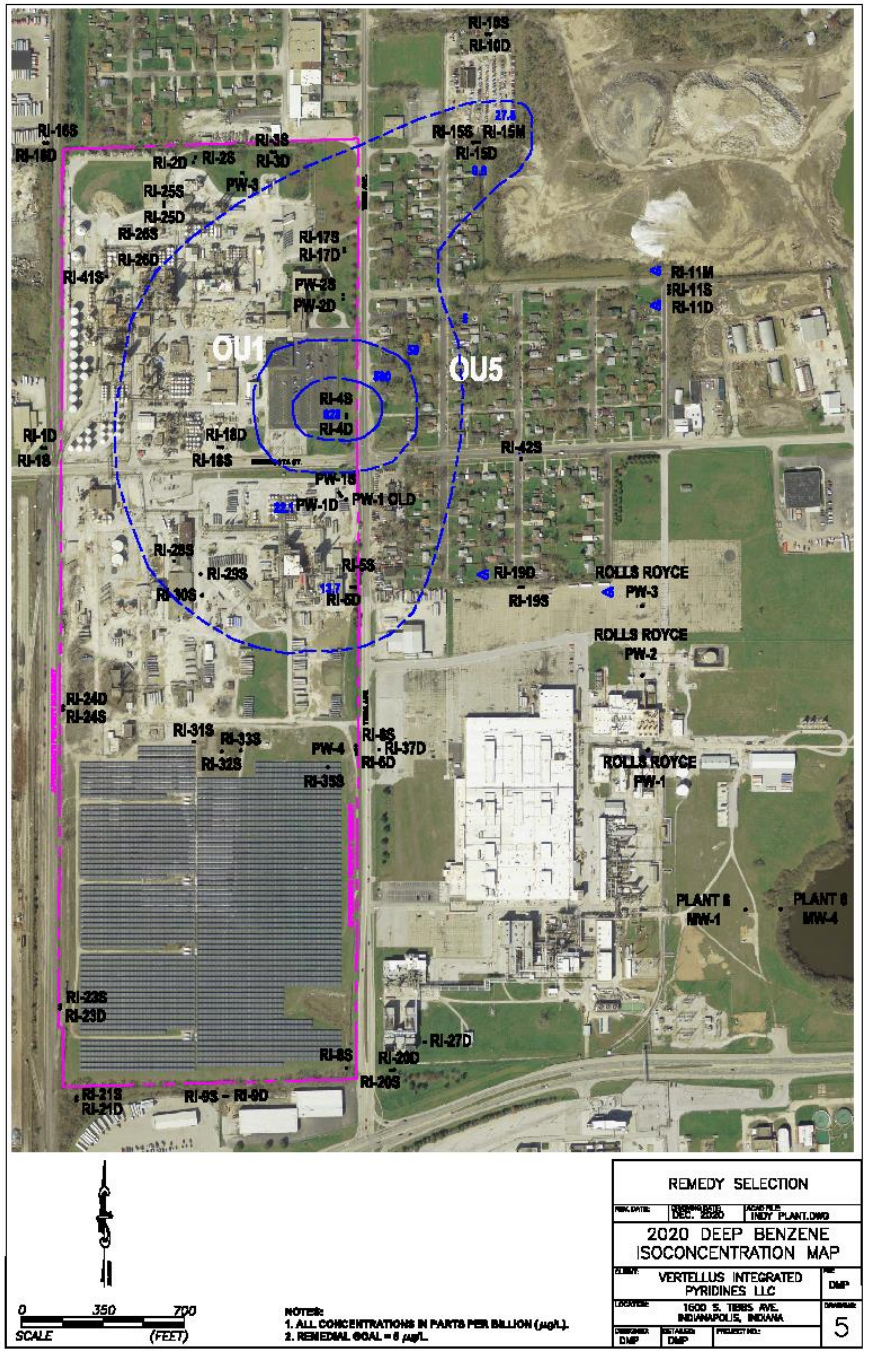


Figure 6 Pyridine Deep Aquifer 1991

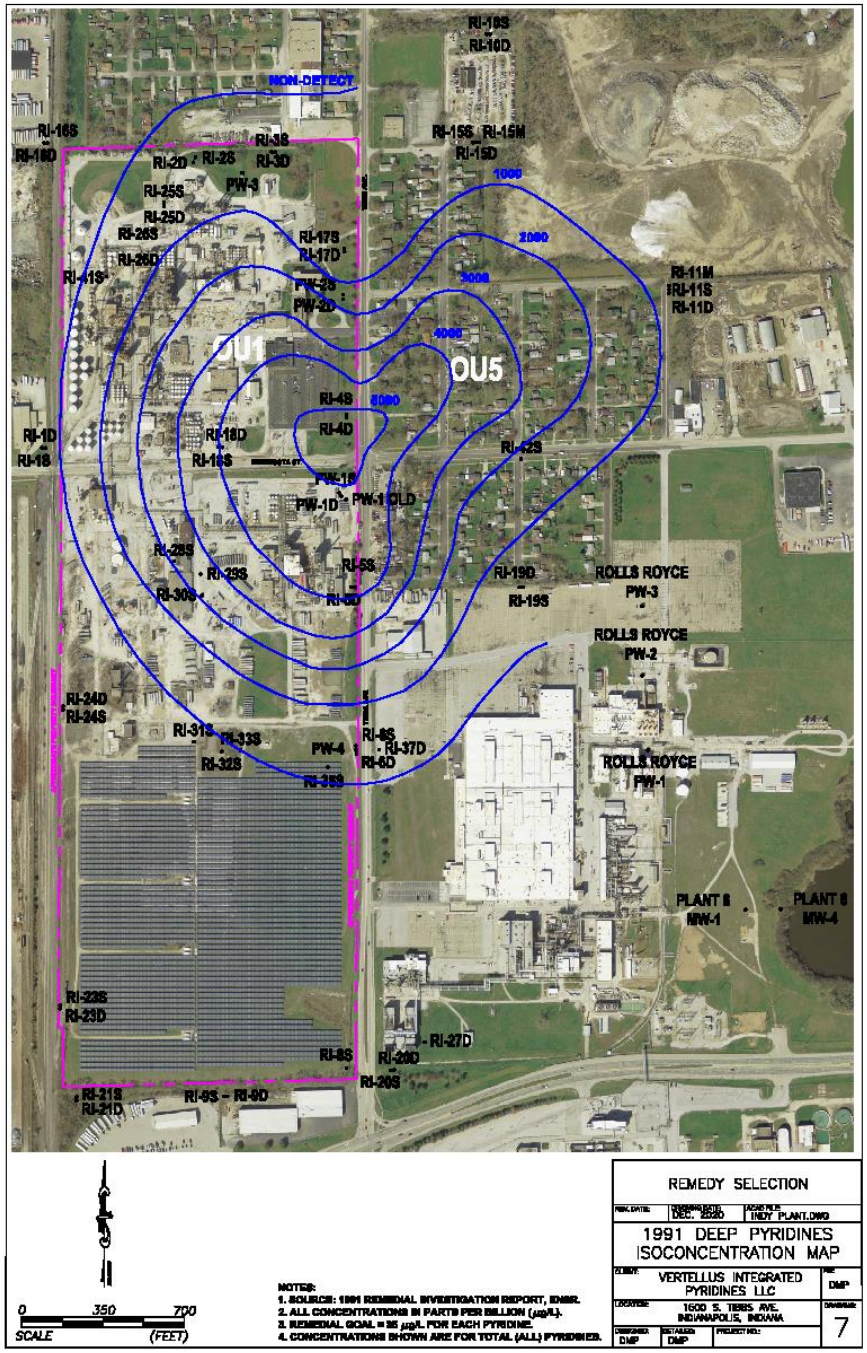


Figure 6 Pyridine Deep Aquifer 2020

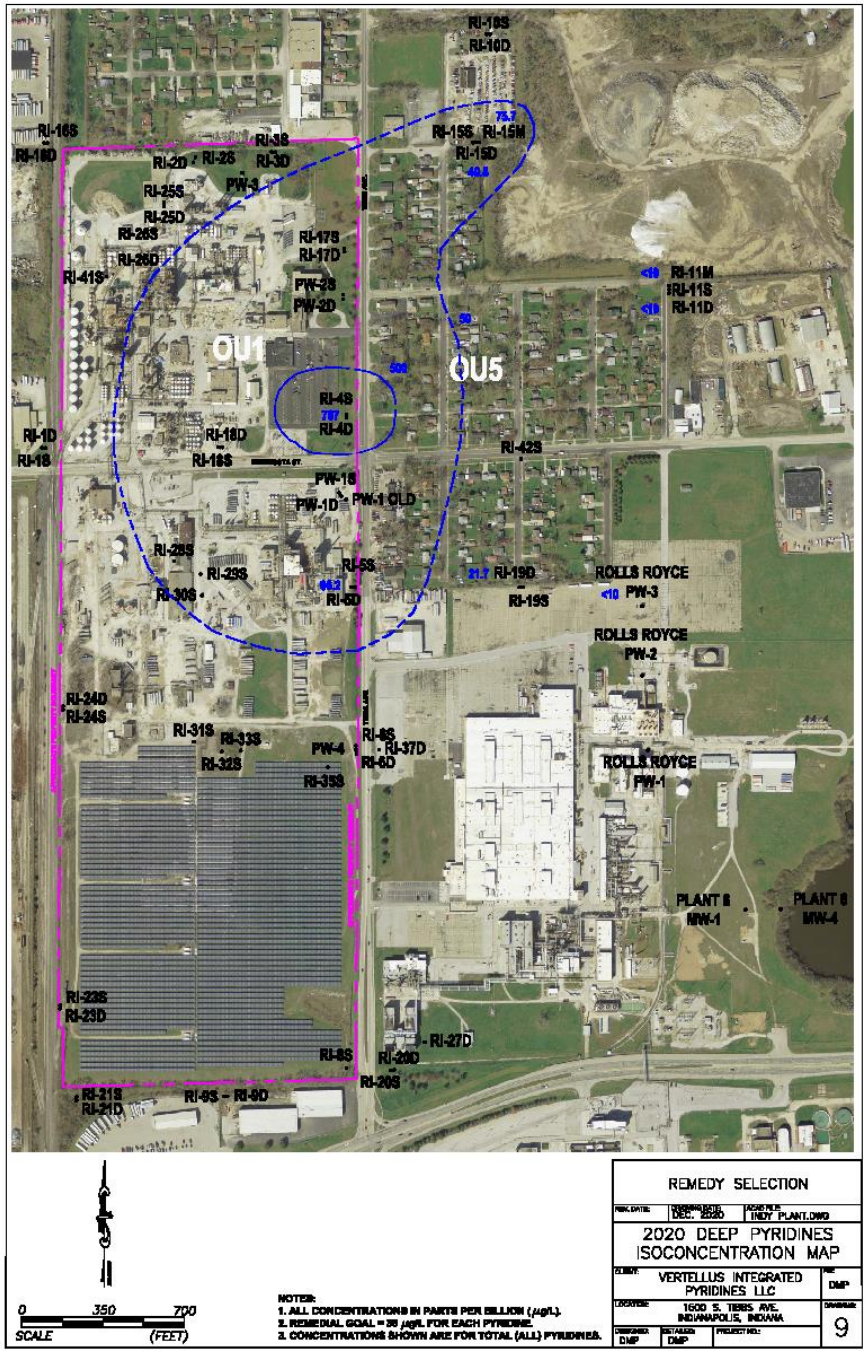


Figure 7 Ammonia Deep Aquifer 1991

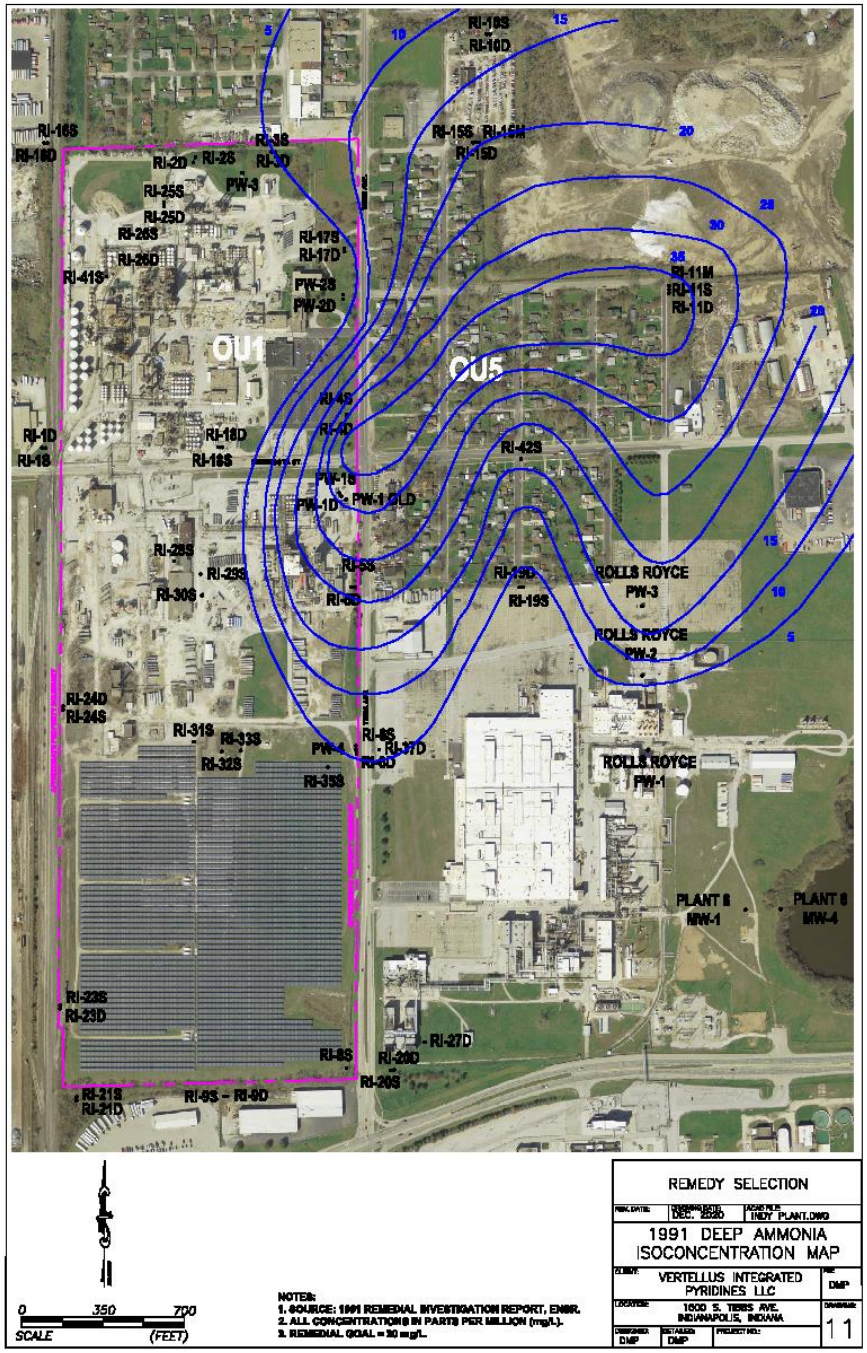
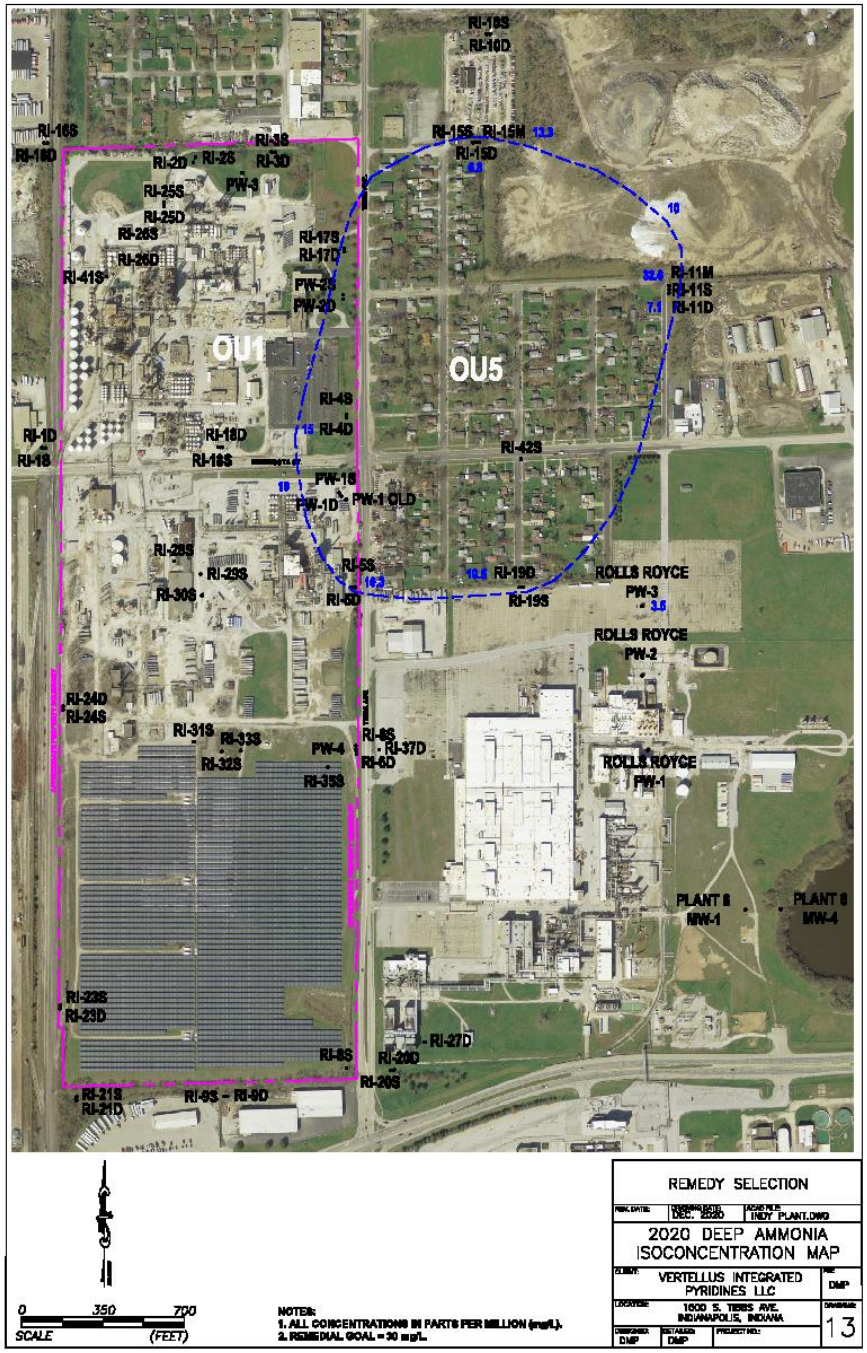


Figure 7 Ammonia Deep Aquifer 2020



Tables 2, 3, and 4 highlight current regulatory exceedances for groundwater in the OU1 and OU5 areas.

Table 2 OU1 and OU5 Shallow Aquifer Impacts above Remediation Goals

Contaminant of Concern/Cleanup Criteria	OU1 Shallow Aquifer Impact, Well ID	OU5 Shallow Aquifer Impact, Well ID
Benzene 5 µg/L	10 µg/L at PW-2S 16.4 µg/L at RI-6S 5.1 µg/L at RI-35S	No impacts
Pyridines 35 µg/L for each pyridine compound	153 µg/L at PW-2S (3,5-Lutidine) 127 µg/L at RI-25S - 91.5 µg/L (2-methyl-3-ethyl pyridine) 53.7 µg/L at RI-4S 63.1 µg/L at RI-29S (2-methyl-3-ethyl pyridine) 112µg/L at RI-32S - 60.8 µg/L (2-methyl-3-ethyl pyridine 275.6 µg/L at RI-33S - 47.5 µg/L (3,5-Lutidine) - 152 µg/L (2-methyl-3 ethyl pyridine)	No impacts
Ammonia 30 mg/L	No impacts above Remediation Goal (RG)	No impacts above RG

Table 3 OU1 Deep and OU5 Medium Aquifer Impacts above RGs

Contaminant of Concern	OU1 Deep Aquifer Impacts and Well ID	OU5 Medium Aquifer Impacts and Well ID
Benzene 5 µg/L	628 µg/L at RI-4D 13.7 µg/L at RI-5S 22.1 µg/L at PW-1D	27.8 µg/L at RI-15M
Pyridines 35 ug/L for each pyridine compound	767 µg/L at RI-4D - 624 µg/L (3,5-Lutidine) - 71.8 µg/L (2-methyl-3-ethyl pyridine)	75.7 µg/L at RI-15M - 47.7 µg/L (3,5-Lutidine)
Ammonia 30mg/L	No impacts above RG	32.6 mg/L at RI-11M

Table 4 OU5 Deep Aquifer Impacts

Contaminant of Concern	OU5 Deep Aquifer Impacts and Well ID
Benzene 5 µg/L	9.8 µg/L at RI-15D
Pyridines 35 µg/L for each pyridine compound	No impacts above RGs
Ammonia 30 mg/L	No impacts above RG

5.5 OU1 Remediation

Groundwater pumping has been ongoing since October 1994, providing containment of groundwater at the property boundary, as required by the OU1 ROD. Two wells were installed (PW-1 and PW-2) and operation began in 1994, with two additional pumping wells (PW-3 and PW-4) added in 1997. PW-1 and PW-2 were replaced with PW-1S, PW-1D, and PW-2S in 2002 and 2003. PW-3 and PW-4 were deactivated in 2005, as approved by EPA. PW-4 was restarted in 2010 to address increasing concentrations at RI-6 and deactivated again upon EPA approval in 2012. Current extraction rates from the first quarter 2020 from PW-1S, PW-1D and PW-2S are 3.0, 14.6 and 29.0 gallons per minute respectively.

The groundwater pumping system is operated, and pumped groundwater is metered as it is discharged to the sanitary sewer, which flows to the Citizen's POTW. These extraction wells were most recently cleaned in spring 2021. O&M of the pumping system is continual, pursuant to the Site CDs.

5.6 2016 Biosparge pilot testing

In 2008, the PRP began testing a biosparge treatment method at various on-Site locations to determine if it would be more efficient and effective in treating or containing the groundwater contaminant plume. Biosparging utilizes the injection of oxygen into the aquifer to raise dissolved oxygen and vadose zone oxygen levels which, in turn, stimulate naturally-occurring bacteria to aerobically degrade benzene and pyridines in-situ.

In 2020, the PRP used the results of the biosparge pilot testing to develop a basis of design in a focused feasibility study (FFS) report to evaluate alternatives to the current groundwater containment remedy. Biosparging is Alternative 3 in the FSS. The basis of design identified the radius of influence, saturated thickness, permeability of the finer grained sediments between the shallow and deep groundwater, operation of the biosparge system, anticipated subsurface results from biosparging, and the time for biodegradation within the treatment zone.

The radius of influence from adjacent sparge wells was overlapped to determine the well positions presented in the FFS. Groundwater modeling was also completed to support the basis of design to demonstrate that the system could achieve the containment RAO. This groundwater modeling was used to evaluate both the enhanced pumping and the biosparging alternatives and considered on-Site hydraulic changes but also considered any changes in off-Site industrial pumping that could impact on-Site sparging operations. The FSS shows that biosparging treatment could contain Site groundwater at the property boundary to aerobically degrade Site contaminants before they migrate off-Site.

6.0 Current and Potential Future Land and Groundwater Uses

6.1 Land Uses

The Site is surrounded by a mix of residential, industrial, and commercial properties. Residential neighborhoods are located immediately adjacent to the eastern boundary (on the east side of Tibbs Avenue) of the Oak Park property. Two residences are also located abutting the northern property boundary near the Lime Pond in the northwest corner of the Site. Commercial and industrial uses are located south and west of the Site.

6.2 Water Uses

The area surrounding the Site is served by municipal water. The area is also controlled by a Marion County ordinance that prohibits the residential use of groundwater in the Site area.

7.0 Summary of Site Risks

7.1 Human Health Risk Assessment

The NCP states that the purpose of the remedial process for a contaminated Site under CERCLA is to implement remedies that reduce, control, or eliminate risks to human health and the environment. A baseline risk assessment is used to evaluate the current and future threats to public health and the environment from a Site.

EPA calculates the probability of non-carcinogenic (not cancer-causing) and carcinogenic (cancer-causing) health effects due to human exposure to Site contaminants in human health risk assessments. For noncarcinogenic chemicals, EPA calculates a hazard quotient (HQ) for each COC. The HQ is the ratio of the estimated exposure level to a chemical compound over a specified period of time. EPA risk assessment guidance recommends that the HQ for exposure to a COC at a Site be limited to one (1.0) or less, which signifies that the exposure level at the Site would not cause adverse health effects. For carcinogenic health risks, EPA calculates the excess lifetime cancer risk (ELCR) from exposure to carcinogenic chemicals at a Site. EPA risk

assessment guidance recommends that Site cleanups achieve a target ELCR range of one in one million ($1x10^{-6}$) to one in ten thousand ($1x10^{-4}$).

A risk assessment was completed for the 1992 ROD that included evaluation of carcinogenic risks from groundwater ingestion for potential exposure scenarios. These include:

Table 5 Human Health Risk Summary

Exposure scenario	Risk	Carcinogenic Risk	Non-carcinogenic risk (Hazard Index or HI)
Off-Site resident	Future	5.5×10^{-4}	247
Off-Site industrial worker	Future	7.35×10^{-4}	277

The non-carcinogenic risks associated with exposure to pyridine, pyridine derivatives, and ammonia, through ingestion of groundwater, were computed for the same exposure scenarios as were used for the carcinogenic risks.

These risks are currently being addressed through operation of the OU1 perimeter groundwater extraction and containment system and through continued enforcement of ICs for the Site and the groundwater-use ordinance for Marion County.

7.2 Ecological Risk

During the Site RI, it was determined that there was no significant risk to environmental receptors from Site contamination. The absence of a suitable habitat for wildlife and the absence of any significant on-Site surface water accumulation provided the justification for this conclusion. This has not changed since the implementation of the Site source control and groundwater remedies.

8.0 Remedial Action Objectives for Groundwater Contamination

The RAOs outlined in the 1992 OU1 ROD remain in effect and this proposed change to the remedy will continue to achieve the following RAOs:

- Perimeter containment to prevent further off-Site migration of groundwater contaminated by the Site; groundwater must meet MCLs at the facility boundary.
- Restore off-Site groundwater in the OU5 area to drinking water quality (MCLs) for future use.

8.1 Groundwater Cleanup Criteria

At the Site, MCLs and maximum contaminant level goals are not applicable, but are relevant and appropriate, because the unconfined aquifer below the Site is a Class II aquifer that has been used in the past for drinking water by residents bordering the Site and could potentially be used as a drinking water source in the future. Groundwater cleanup criteria from the OU1 ROD are listed below (Table 6).

Table 6 OU1 ROD Groundwater Cleanup Criteria

Contaminant of Concern	Cleanup Criteria from OU1 ROD
Benzene	0.005 mg/L
Toluene	1 mg/L
Ethylbenzene	700 µg/L
Total Xylene	10 mg/L
Ammonia-nitrogen	30 mg/L
Nitrate-nitrogen	10 mg/L
Pyridine	0.035 mg/L
2-Picoline	0.035 mg/L
3&4-Picoline	0.035 mg/L
2,6-Lutidine	0.035 mg/L
2-Ethylpyridine	0.035 mg/L
2,4 & 2,5-Lutidine	0.035 mg/L
2,3-Lutidine	0.035 mg/L
3-Ethylpyridine	0.035 mg/L
4-Ethylpyridine	0.035 mg/L
3,5-Lutidine	0.035 mg/L
3,4-Lutidine	0.035 mg/L
2 Methyl-5-ethylpyridine	0.035 mg/L
2 Methyl-3-ethylpyridine	0.035 mg/L
3 Ethyl-4-ethylpyridine	0.035 mg/L
Arsenic	0.01 mg/L
Lead	0.015 mg/L
Chromium	0.1 mg/L

9.0 Description of Remedial Alternatives

EPA evaluated three alternatives in the Proposed Plan in order to arrive at the selected amended remedy for the Site. EPA's Superfund guidance generally requires that the "No Action" alternative be evaluated to establish a baseline for comparing the action alternatives.

These three alternatives are described below.

Alternative 1: No Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Timeframe: None

Under Alternative 1, EPA would take no further action at the Site for groundwater cleanup and groundwater monitoring data would no longer be collected.

Alternative 2: Enhanced Groundwater Pumping

Estimated Capital Cost: $420,000
Estimated Annual O&M Cost: $760,000
Estimated Present Worth Cost: $10,490,000
Estimated Construction Timeframe: 4-6 months

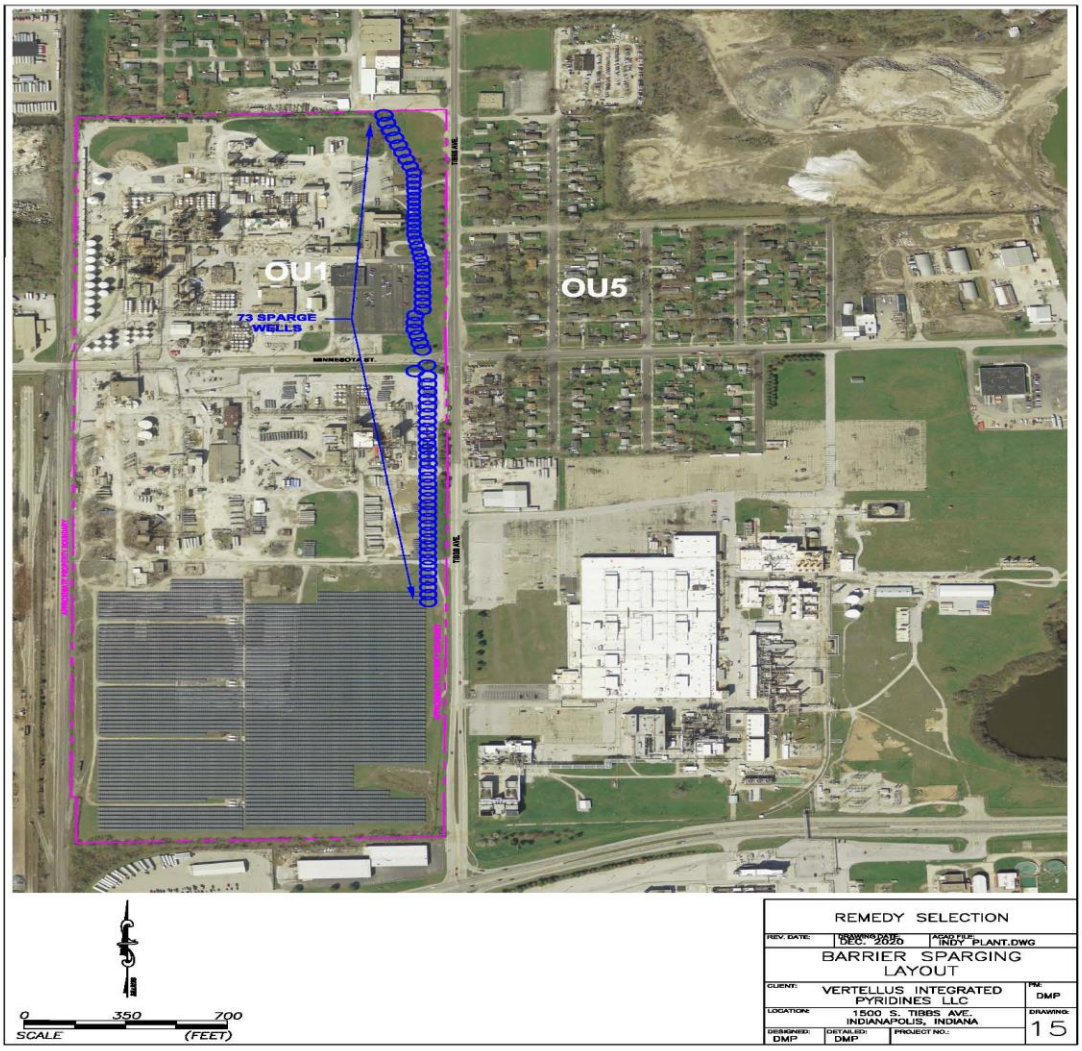
Under Alternative 2, the existing groundwater pumping system would continue as currently operated and would be supplemented with additional pumping wells. Shallow groundwater pumping would continue from PW-1S and PW-2S and deep pumping would continue from PW-1D. Three additional pumping well clusters would be added to augment the existing groundwater extraction system, expanding pumping coverage to the north and south of the existing system to provide additional containment. The expanded system would continue to require routine O&M to maintain effectiveness. Groundwater monitoring would continue throughout the OU1 and OU5 area until cleanup levels are met and to monitor satisfaction of the OU1 RAO.

Alternative 3: Barrier Biosparging

Estimated Capital Cost: $1,120,000
Estimated Annual O&M Cost: $240,000
Estimated Present Worth Cost: $4,330,000
Estimated Construction Timeframe: 6-8 months

Under Alternative 3, biosparging wells would be installed along the entire eastern perimeter of the property, utilizing compressors to inject air into the base of the deep aquifer (See Figure 8).

Figure 8 – Alternative 3 – Barrier Biosparging



Injected air would be dispersed throughout the aquifers, resulting in aerobic conditions that would promote in-situ biodegradation of benzene and pyridines. Once shown to be effective at treating and containing the groundwater plume, the extraction wells would be shut down. This alternative would also include ongoing monitoring of groundwater to measure contaminant conditions and of soil gas, both on- and off-Site, to ensure that the groundwater treatment is not creating vapor intrusion concerns for the properties immediately across the street from the line of sparge wells.

Both Alternatives 2 and 3 are treatment alternatives designed to achieve RAOs for the groundwater and both rely on groundwater monitoring to prevent the further migration of contaminants off-Site.

None of the proposed treatment alternatives rely exclusively on ICs to achieve protectiveness. However, both Alternatives 2 and 3 include ICs as part of the overall remedial approach.

9.1 Institutional Controls

ICs are required to ensure the protectiveness of the remedy. ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas which do not allow for UU/UE.

The 1997 ROD stated that ICs currently in place at the Site included a control that prohibits the Site owner from using the groundwater underlying the property for ingestion or dermal contact. This control allows the Site owner to use the groundwater under the Site for industrial purposes (non-contact cooling water) only after obtaining the express written approval of EPA, or any successor federal government department or agency. These controls shall continue in full force, prohibiting use of the groundwater underlying the Site as long as the groundwater contaminant concentrations exceed drinking water standards.

ICs have been reviewed and approved by EPA and IDEM and recorded in a Declaration of Environmental Restrictive Covenant (ERC) for the Site in December 2012. This ERC also restricts use of the property that interferes with the work performed or impairs the effectiveness of implemented remedies and precludes residential use of the property. This covenant is currently functioning as intended, as verified annually by Vertellus.

10.0 Comparative Analysis of Alternatives

This section of the ROD Amendment profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. Of the nine criteria summarized in Table 7, the selected amended remedy meets the threshold criteria of protecting human health and the environment and complying with ARARs. The selected remedy also presents the best balance of all the nine evaluation criteria, including the balancing and modifying criteria, as discussed below.

Table 7: Nine Evaluation Criteria

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Threshold Criteria

1. **Overall Protection of Human Health and the Environment** determines whether an alternative eliminates, reduces, or controls threats to the public health and the environment through engineering controls, treatment, or ICs**.**
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the Site, or whether a waiver is justified.
Balancing Criteria
3. **Long-term Effectiveness and Performance** considers the ability of an alternative to maintain protection of human health and the environment over time.
4. **Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment** evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
5. **Short-term Effectiveness** considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. **Implementability** considers the technical and administrative feasibility of implementing the alternative, including factors such as relative availability of goods and services.
7. **Cost** includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total of an alternative over time in today's dollar value. Cost estimates are expected to be accurate within a range of +50% to -30%.
Modifying Criteria
8. **State Acceptance** considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and the Proposed Plan.
9. **Community Acceptance** considers whether the local community agrees with EPA's analyses and Preferred Alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

10.1 Overall Protection of Human Health and the Environment

Alternative 1 is not protective of human health and the environment because taking no action to address groundwater does not protect on and off-Site users of groundwater from Site-related groundwater contamination, nor does it provide for monitoring to determine if contaminants

exceed regulatory standards beyond the property boundary. Therefore, Alternative 1 will not be evaluated further.

Alternative 2 would be protective because it contains contaminated groundwater from migrating beyond the property boundary and provides for off-Site treatment of extracted water at the POTW. Alternative 3 would be protective because it provides for direct treatment of Site contaminants while containing contaminated groundwater from migrating beyond the property boundary.

10.2 Compliance with ARARs

Alternatives 2 and 3 would comply with Federal and State ARARs pertaining to OU1 groundwater cleanup standards and underground injection control (UIC) requirements.

Groundwater

EPA has identified the requirements of 40 C.F.R. § 141.61(a); 40 C.F.R. §§ 264.117-120, 264.92 and 264.94; 327 Indiana Administrative Code (IAC) 2-1; 327 IAC 2-11-4; 327 IAC 2-11-5; 327 IAC 2-11-6; 327 IAC 2-11-8; and 327 IAC 8-2 as ARARs, which pertain to drinking water supplies. The groundwater under and near the Site is not a current source of drinking water. The groundwater outside of the facility boundaries is future source of drinking water.

Biosparging

EPA has also identified the requirements of 40 C.F.R. § 144; 40 C.F.R. § 146; 40 C.F.R § 268; 40 C.F.R. § 61, Subpart A; 326 IAC 2-1.1-1; 326 IAC 2-1.1-2; 326 IAC 2-1.1-3; 326 IAC 8-1; and 327 IAC 5-4-2 as ARARs, which pertain to underground injection activities. Injection of clean air is allowed and subject to UIC regulations. Soil gas monitoring of the biosparge system would be performed to evaluate the vapor intrusion (VI) pathway and any potential VI issues posed by biosparging.

Alternatives 2 and 3 would comply with federal and State ARARs pertaining to OU1 groundwater cleanup standards and UIC requirements.

10.3 Long-term Effectiveness and Permanence

Alternatives 2 and 3 are both effective in the long-term. Both alternatives will provide the requisite containment to prevent contaminated groundwater from migrating beyond the property boundary. Alternative 3 is more effective in the long-term because biosparging will treat contaminants in the groundwater leading to permanent reductions in groundwater concentrations, which should result in achieving cleanup standards for the Site in a shorter timeframe.

10.4 Reduction of Toxicity, Mobility, or Volume (TMV) through Treatment

Alternative 3 will treat contaminated groundwater with biosparging, which will more expeditiously reduce the toxicity, mobility, and volume of in-place groundwater contamination through treatment and containment. Alternative 2 provides for treatment of extracted contaminated groundwater at the POTW, but does not include in-place treatment of groundwater under the Site.

10.5 Short-term Effectiveness

Alternative 2 and 3 are both effective in the short-term. Construction of Alternative 2 will be completed faster, but both alternatives can be completed and operational in a single construction season. Workers would be required to wear appropriate levels of protection to avoid exposure during remedy construction.

Under Alternative 3, the existing groundwater extraction system would continue to operate until the selected remedy is fully implemented and operational. Risks to the remediation workers and the surrounding neighborhood from treatment of groundwater will be monitored through soil gas and groundwater monitoring, during and after construction of the selected remedy.

10.6 Implementability

Materials and services are widely available to implement Alternatives 2 and 3. Alternative 2 would expand the existing groundwater extraction system, which has been operational at the Site since 1994. However, the additional groundwater volume extracted under Alternative 2 would increase the current discharge of extracted groundwater to the local POTW, which has actively been trying to manage and minimize combined sewer overflow events resulting from groundwater discharge in the Indianapolis area. There is ample space along the Site property boundary to install the new sparge locations and monitoring wells required for Alternative 3 and the presence of underground utilities that may impact well installation will be tracked and managed.

10.7 Cost

Alternative 2 has the higher present worth cost due to the cost of disposal of extracted water at the POTW. While Alternative 3 has the higher capital cost due to installation of the biosparging infrastructure, it has substantially lower O&M costs and thus a lower present worth cost overall.

10.8 State Acceptance

IDEM has indicated its concurrence with this ROD Amendment. EPA will add the letter of concurrence from IDEM to the Administrative Record once it is received.

10.9 Community Acceptance

EPA evaluated the community's acceptance of the proposed alternative at the end of the public comment period, which ran from June 3, 2021 to July 2, 2021. EPA received several comments in support of the proposed remedy and one comment from an individual that raised questions about potential vapor intrusion issues. These comments and EPA's responses are contained in the responsiveness summary below (See Section 14).

11.0 Principal Threat Wastes

Principal threat waste is Site-related waste that includes or contains hazardous substances, pollutants or contaminants that act as a source for migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. The NCP states that EPA expects to:

- Use treatment to address principal threats posed by a Site, wherever practicable.
- Use engineering controls, such as containment, for wastes that pose a relatively low long-term threat or where treatment is impractical.
- Use a combination of methods, as appropriate, to achieve protection of human health and the environment, with a priority placed on treating waste that is liquid, highly toxic or highly mobile.
- Use ICs to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances.

Principal threat waste was not identified in the OU1 ROD or this ROD Amendment.

12.0 Selected Remedy

Based on information currently available, EPA's preferred alternative for amending the 1992 ROD is Alternative 3 – Barrier Biosparging.

12.1 Rationale for the Selected Remedy

The Preferred Alternative will meet Site RAOs by protecting human and environmental receptors from exposure to contaminated groundwater, protecting existing and future residential water supplies from the potential migration of contaminated groundwater from the Site, and restoring off-Site groundwater quality to comply with State and federal groundwater standards within a reasonable timeframe.

IDEM, as the support agency, concurs with EPA's preferred Alternative 3.

Although groundwater extraction and barrier biosparging would both be protective of human health and the environment and attain ARARs, EPA's preferred alternative is Alternative 3 – Barrier Biosparging, because it is easily implementable, cost-effective, and provides direct in-place treatment of groundwater, which will accelerate the timeframe to achieve groundwater cleanup standards in the OU5 area.

Barrier biosparging is protective because it will achieve risk reduction by treating groundwater at the property boundary to comply with State and federal groundwater and UIC standards (See Figure 8). EPA will continue to review Site monitoring data, operation and maintenance reports; monitor Site conditions, including groundwater and soil gas monitoring; and conduct FYRs. Institutional controls remain in place that prohibit excavation, construction, or other activities that could interfere with the remedy and prohibit consumptive use of groundwater at the Site and are monitored regularly for compliance.

12.2 Documentation of Significant Changes

EPA published a proposed plan for this operable unit action on June 3, 2021 that proposed the selection of Alternative 3 – Barrier Biosparging as the amended OU1 remedy.

EPA received a number of comments during the public comment period. The majority were in support of Alternative 3, and the remedy recommended in the Proposed Plan was not changed.

13.0 Statutory Determinations

Under CERCLA Section 121(b) and the NCP, the lead agency must select remedies that 1) are protective of human health and the environment, 2) comply with applicable or relevant and appropriate requirements (unless a statutory waiver is justified), 3) are cost-effective, and 4)

utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment technologies that permanently and significantly reduce the TMV of hazardous wastes as a principal element and a preference against off-Site disposal of untreated wastes. The following sections discuss how the selected amended alternative for the 1992 ROD meets these statutory requirements.

This ROD Amendment does not change the designation of ARARs in the existing OU1 ROD except where indicated.

13.1 Protection of Human Health and the Environment

Alternative 3 will protect human health and the environment by treating groundwater in a sparge line along the eastern property perimeter to achieve the RAO of containment (See Figure 8) and restoration of off-property groundwater to drinking water standards.

Groundwater monitoring will be required to ensure that the implementation of biosparging achieves the RAOs of plume containment at the property boundary and off-property groundwater restoration. Soil gas monitoring will be required to ensure that the implementation of biosparging does not generate vapor intrusion issues along and near the property boundary. EPA retains authority to require additional measures to protect human health and the environment from any vapor intrusion impacts, if necessary.

Institutional controls have already been imposed by the Marion County Health Department. These controls ensure that all residents in the area are connected to an uncontaminated city water supply and that all wells in the affected aquifer have already been sealed and abandoned in compliance with existing State law and regulations. No unacceptable short-term risks will be caused by implementation of the remedy.

13.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected Alternative 3 complies with ARARs. The key ARARS for this ROD Amendment include State and federal chemical-specific cleanup standards for groundwater contamination and for barrier biosparging, including injection of oxygen and vapor intrusion regulations.

As previously outlined in the RODs for OU1 and OU5, groundwater ARARs include: 40 C.F.R. § 141.61(a), Subpart A; 40 C.F.R. §§ 264.117-120, 264.92 and 264.94; 327 Indiana Administrative Code (IAC) 2-1; 327 IAC 2-11-4; 327 IAC 2-11-5; 327 IAC 2-11-6; 327 IAC 2-11-8; and 327 IAC 8-2, which pertain to drinking water supplies. The groundwater under and near the Site is not a current source of drinking water but is potentially a drinking water source in the future.

The underground injection ARARs include 40 C.F.R. Part 268 and 40 C.F.R. Section 61, Subpart A. EPA has identified the requirements of 40 C.F.R. § 144; 40 C.F.R. § 146; 40 C.F.R § 268; 40 C.F.R. § 61, Subpart A; 326 IAC 2-1.1-1; 326 IAC 2-1.1-2; 326 IAC 2-1.1-3; 326 IAC 8-1; and 327 IAC 5-4-2 as ARARs, which pertain to underground injection of clean air to treat groundwater. Injection of clean air is allowed and subject to UIC regulations.

Underground Injection Control Program requirements will be applicable to the biosparging remedial action. The regulations set forth at 40 CFR Part 144 are applicable. The criteria and standards set forth at 40 CFR Part 146 are also applicable to this action.

State ARARs for underground injection are applicable. The regulations are set forth at 326 IAC 2-1.1-1, 326 IAC 2-1.1-2, 326 IAC 2-1.1-3, 326 IAC 8-1, and 327 IAC 5-4-2. Soil gas monitoring of the biosparge system would be performed to evaluate the vapor intrusion (VI) pathway and any potential VI issues posed by biosparging.

13.3 Cost-Effectiveness

In EPA's judgment, the selected alternative is cost-effective and represents a reasonable value for the money that has and will continue to be spent. This determination was made according to the NCP, 40 C.F.R. § 300.430(f)(l)(ii)(D), which states that a remedy is cost-effective if its costs are proportional to its overall effectiveness.

13.4 Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery Technologies) to the Maximum Extent Practicable

EPA has determined that the selected alternative represents the maximum extent to which permanent solutions can be utilized in a practicable manner at the Site. When comparing both remedial options, i.e., enhancing the existing groundwater extraction and treatment system versus barrier biosparging, both are protective of human health and the environment and would comply with ARARs.

However, barrier biosparging provides the best balance of trade-offs in terms of long-term effectiveness and permanence (through permanent groundwater treatment), short-term effectiveness, implementability, and cost, while considering the statutory preference for treatment as a principal element and consideration of state and community acceptance.

Groundwater monitoring and ICs are critical components to ensure that the selected amended remedy is protective and will achieve RAOs. The amended groundwater remedy represents a permanent solution to address the risks posed at the Site and restoring groundwater to beneficial use.

13.5 Five-Year Review Requirements

Because hazardous substances, pollutants, or contaminants remain on-Site above levels that allow for UU/UE, statutory FYRs are required. EPA conducted FYRs at the Site in 2000, 2005, 2010, 2015 and 2020. The last FYR was completed on February 3, 2020.

14.0 Responsiveness Summary

In accordance with Sections 113(k)(2)(B) and 117 of CERCLA and with the NCP, EPA held a public comment period to allow interested members of the public to comment on the proposed ROD Amendment for the Site. A 30-day public comment period was held from June 3, 2021 to July 2, 2021.

This Responsiveness Summary complies with Section 113(k)(2(B)(iv) of CERCLA and provides a summary of the comments received during the comment period and EPA's response to those comments. After evaluation of all comments received, EPA made no substantive changes to the proposed amended remedy.

Summary of Substantive Comments

Summary of comments regarding EPA outreach to the surrounding community to communicate ongoing Site work.

Comment 1: Several commentors asked how EPA would provide updates to the community on the progress of the design and implementation of the amended remedy.

Response 1: EPA intends to communicate regularly throughout the implementation of the amended remedy. EPA will post regular construction updates on the EPA webpage and release a fact sheet before construction begins with sequencing and timing for the remedy construction, which is anticipated to begin in 2022. EPA has added the commentors to the Site mailing list and they will receive all future Site updates directly.

Comment 2: A commentor asked if non-English speaking neighbors had been contacted.

Response 2: There are several churches for Hispanic congregations currently on the mailing list for the Site. EPA has not previously been asked for Site information to be disseminated to non-English speaking neighbors. As a result of this comment, EPA will attempt to contact other non-English speaking neighbors to determine their level of interest and will adjust community outreach as appropriate.

Comment 3: A commentor asked if EPA or Vertellus would resume regular meetings with the neighbors for Site information.

Response 3: EPA will continue to communicate Site progress through fact sheets, meetings, and website updates as remedy planning and construction progress.

Comment 4: A commentor asked what concerns would prompt an unscheduled community meeting for the Site.

Response 4: If there is an incident at the Site related to remedy construction that could cause impacts to the surrounding community, EPA would take immediate steps to inform the neighbors, including website updates, door to door visits, and a meeting if necessary.

Summary of comments related to evaluated alternatives.

Comment 5: A commentor expressed support for the proposed Alternative 3 – Barrier Biosparging, as a more permanent solution to Site contamination.

Response 5: EPA appreciates the support for Alternative 3.

Comment 6: A commentor asked how the proposed alternatives addressed soil contamination or how neighbors could get their soil tested for contamination.

Response 6: On-Site soil contamination has been addressed previously through the soil treatment remedies for Operable Units 2 and 4 and the covers installed and maintained according to the remedies for Operable Units 3 and 4. The Site RI/FS determined that soil contamination detected on-Site was a result of on-Site operations, which did not extend off-Site. If neighbors are interested in soil quality on their properties, they can contact the Marion County Health Department for further assistance.

Comment 7: A commentor asked if the on-Site remediation would have any direct impacts on increased truck traffic through the community.

Response 7: The majority of the remedy construction will occur on-Site and will have limited impacts on community traffic. The installation of wells in off-Site areas to help monitor the progress of the remedy will also have limited impacts.

Comment 8: A commentor at the meeting and during the comment period expressed concern about vapor intrusion issues for the properties adjacent to the Site during biosparging remediation activities and disagreed with EPA's proposed remedy.

Response 8: Biosparging is a common method for remediating contaminated groundwater. While contaminant concentrations at the Site are relatively low and it is unlikely that vapors would travel to nearby properties during remediation, there are several safeguards built into the system to protect against this possibility.

Monitoring locations will be installed very close to the biosparging system to monitor vapors.

These will be located near the Vertellus property line and will be monitored regularly during initial system operations. If there are any concentrations of concern, air injection can be adjusted. If samples continue to exceed standards, additional monitoring data would be collected pursuant to Section 8.3.5 (Contingency Plan) of the November 2020 Focused Feasibility Study report for OU1.

If this monitoring shows potential exceedances near occupied buildings, indoor air samples would be collected by Vertellus, with results shared with EPA and the property owners, as described in Section 8.3.5 of the OU1 FFS report. Access from the property owner for Vertellus sampling would be required, and the access agreement would need to include reporting of results to the property owner. If monitoring shows indoor air exceedances, Vertellus would be required to install a system to mitigate the risks in indoor air at no cost to the property owner and would be monitored under EPA oversight.

Operation of the biosparging system will be continuously monitored and adjusted to minimize the potential for any off-Site impacts, and on and off-Site monitoring will be used to determine if additional measures are necessary to protect nearby properties.

Biosparging will be more effective at reducing contaminant concentrations in groundwater than the existing groundwater extraction over the long term.

Comment 9: A commentor asked if the location of the off-Site wastewater treatment plant to be utilized under Alternative 2 is the location at Harding and Raymond Streets.

Response 9: EPA is not selecting Alternative 2 as the amended OU1 remedy. However, current extracted groundwater from the Site is sent to the Belmont Wastewater Treatment Plant, located at 2700 Belmont Street, Indianapolis.

Comment 10: A commentor asked if remedy requirements would change if Vertellus decided to relocate down the road.

Response 10: EPA will negotiate for a consent decree with Vertellus, to be entered in federal court, with requirements for Vertellus to install the biosparging remedy and operate all Site remedies. A standard provision in EPA's CERCLA consent decrees includes financial assurance from the performing party, in this case Vertellus Integrated Pyridines LLC, which will be sufficient to pay for the work to continue if Vertellus is no longer viable. Another standard provision in EPA's CERCLA consent decrees requires that all Site remedy requirements run with the land in case the property is sold, so that remediation continues until all performance standards have been met.

These comments are paraphrased in order to effectively summarize them in this document. The reader is referred to the public meeting transcript, which is available in the public information repository, located at the Indianapolis Public-Library, 48 East St. Claire Street, Indianapolis, Indiana. Written comments received at EPA's regional office are on file in the Region 5 office

and on EPA's website at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0501215 . A copy of these written comments has also been placed in the Indianapolis Public Library and the EPA website.

Appendix A Administrative Record Index

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR THE
REILLY TAR & CHEMICAL CORPORATION SITE
INDIANAPOLIS, MARION COUNTY, INDIANA

OPERABLE UNIT 1
UPDATE #5

JULY, 2021
SEMS ID:

NO.	SEMS ID	DATE	AUTHOR	RECIPIENT	TITLE/DESCRIPTION	PAGES
1	962350	11/03/20	Peterson Corporation	U.S. EPA	Focused Feasibility Study Regarding OU-1	404
2	965715	05/01/21	U.S. EPA	General Public	Fact Sheet - Proposal to Change Cleanup Plan for Groundwater	8
3	965742	05/24/21	U.S. EPA	General Public	Proposed Plan Regarding OU-1 ROD Amendment	31
4	966015	06/01/21	U.S. EPA	General Public	Proposed Plan Regarding OU-1 Remedy Update ROD Amendment	32
5	966228	06/15/21	U.S. EPA	General Public	Public Hearing Transcript	44
6	964615	06/24/21	Private Citizens Organization	General Public	(Redacted) Public Comment	1
7	964616	06/24/21	Private Citizens	General Public	(Redacted) Public Comment	1
8	964617	07/02/21	Business Owner	General Public	(Redacted) Public Comment	1
9	_ _-------- _	--------_ _ _ _ _---------		_-------- _ _ _ _	Record of Decision *(Pending)*	_ ------_ _

Appendix B EJSCREEN Analysis

EJSCREEN Report (Version 2020)

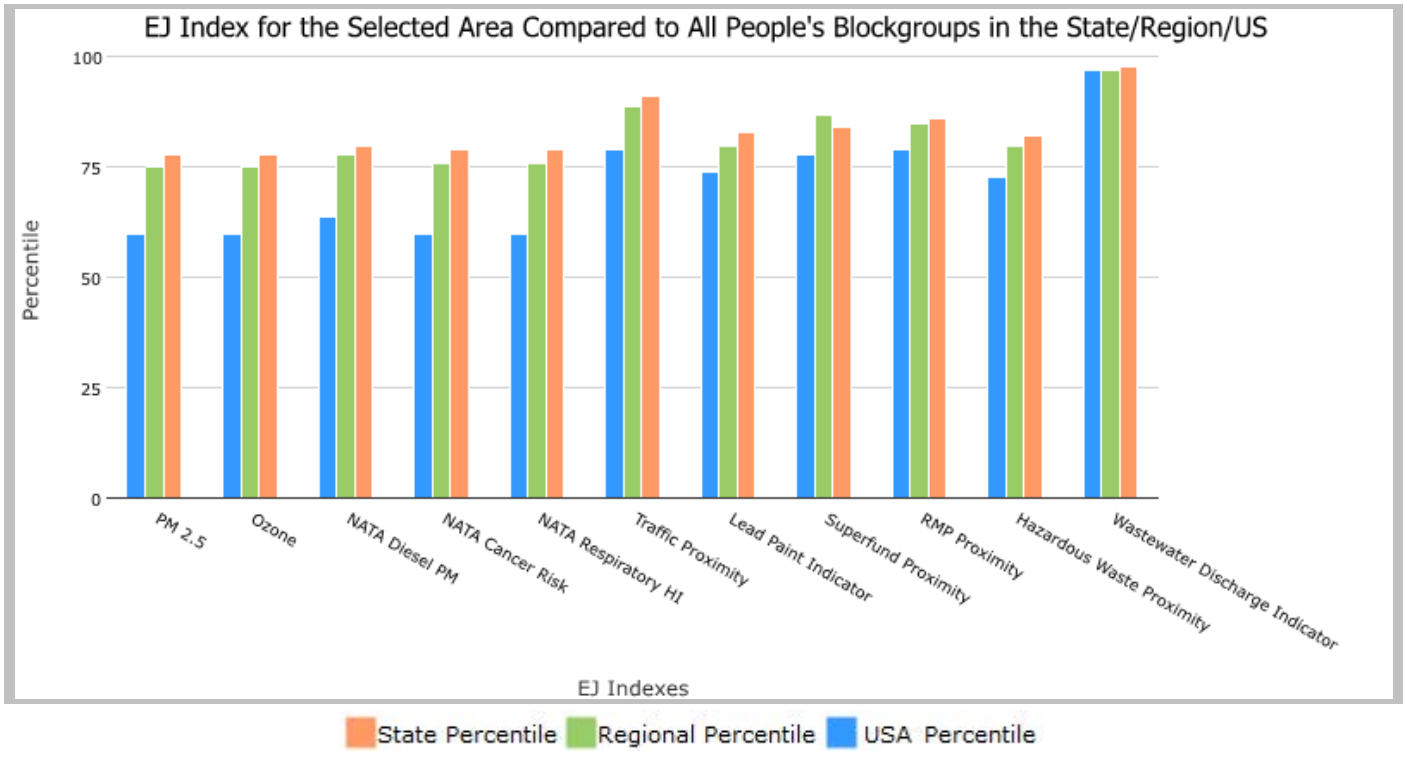
1 mile Ring around the Area, INDIANA, EPA Region 5

Approximate Population: 5,884

Input Area (sq. miles): 5.33

Reilly Tar Indianapolis

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	78	75	60
EJ Index for Ozone	78	75	60
EJ Index for NATA* Diesel PM	80	78	64
EJ Index for NATA* Air Toxics Cancer Risk	79	76	60
EJ Index for NATA* Respiratory Hazard Index	79	76	60
EJ Index for Traffic Proximity and Volume	91	89	79
EJ Index for Lead Paint Indicator	83	80	74
EJ Index for Superfund Proximity	84	87	78
EJ Index for RMP Proximity	86	85	79
EJ Index for Hazardous Waste Proximity	82	80	73
EJ Index for Wastewater Discharge Indicator	98	97	97



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

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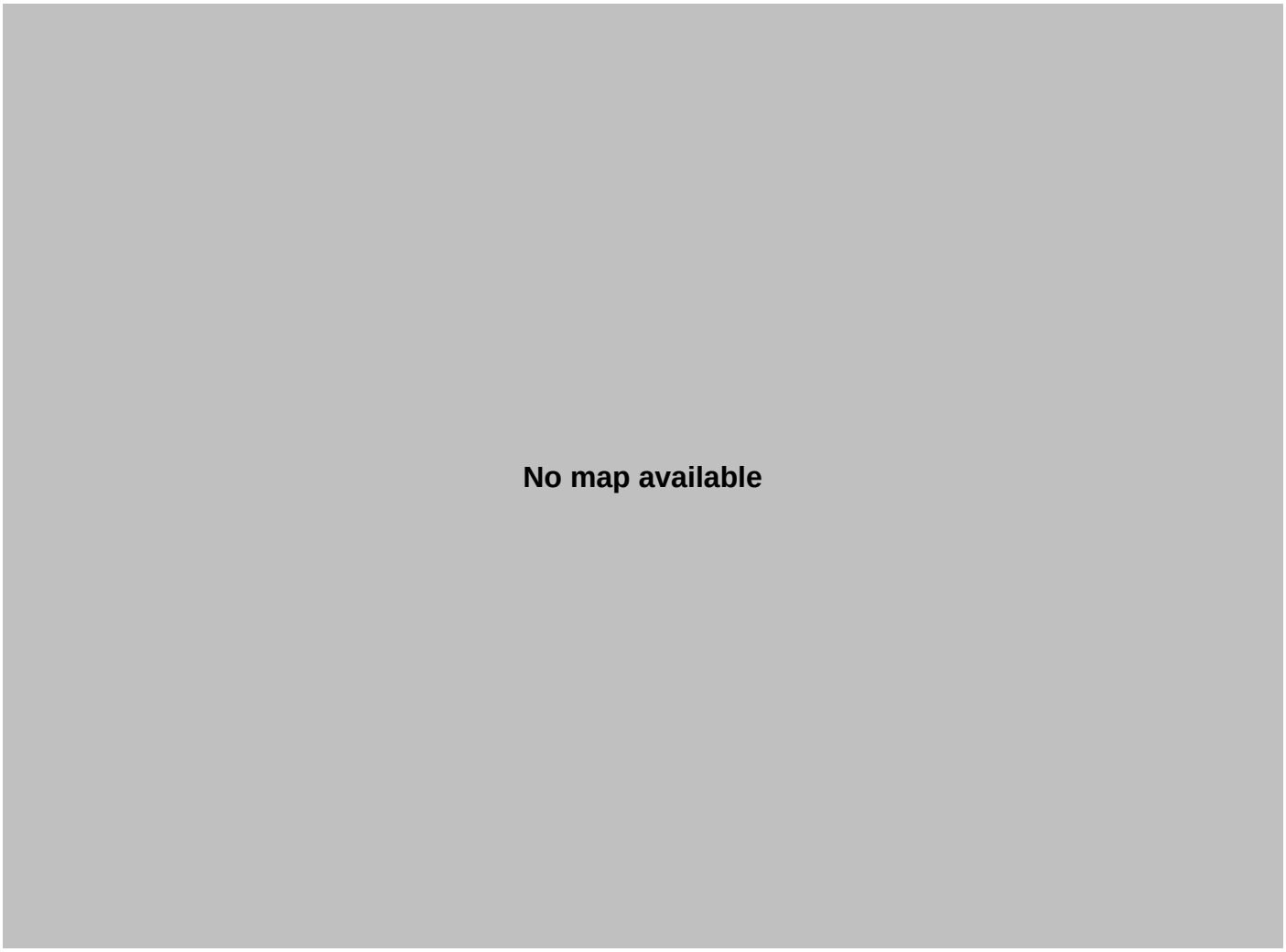
Reilly Tar Indianapolis



Sites reporting to EPA	
Superfund NPL	1
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	6

EJSCREEN Report (Version 2020)

1 mile Ring around the Area, INDIANA, EPA Region 5

Approximate Population: 5,884

Input Area (sq. miles): 5.33

Reilly Tar Indianapolis

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	9.36	8.67	97	8.4	84	8.55	76
Ozone (ppb)	43.6	44.9	4	43.8	34	42.9	57
NATA* Diesel PM (µg/m^3)	0.938	0.45	97	0.446	90-95th	0.478	90-95th
NATA* Cancer Risk (lifetime risk per million)	32	26	95	26	80-90th	32	50-60th
NATA* Respiratory Hazard Index	0.46	0.34	97	0.34	90-95th	0.44	50-60th
Traffic Proximity and Volume (daily traffic count/distance to road)	1200	380	94	530	89	750	84
Lead Paint Indicator (% Pre-1960 Housing)	0.69	0.34	86	0.38	81	0.28	87
Superfund Proximity (site count/km distance)	0.7	0.17	95	0.13	96	0.13	97
RMP Proximity (facility count/km distance)	3.4	0.81	96	0.83	96	0.74	96
Hazardous Waste Proximity (facility count/km distance)	8.8	2	98	2.4	95	5	91
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	6.6	0.16	99	2.4	96	9.4	97
Demographic Indicators							
Demographic Index	41%	27%	81	28%	78	36%	65
People of Color Population	22%	21%	69	25%	62	39%	40
Low Income Population	61%	33%	88	30%	90	33%	89
Linguistically Isolated Population	1%	2%	72	2%	67	4%	52
Population With Less Than High School Education	35%	11%	97	10%	97	13%	93
Population Under 5 years of age	7%	6%	65	6%	68	6%	65
Population over 64 years of age	10%	15%	25	16%	25	15%	30

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice