RECORD OF DECISION AMENDMENT

Vineland Chemical Company Superfund Site
Cumberland County, New Jersey

Operable Unit 3: Exposed Sediment/Soil of the Blackwater Branch Floodplain

United States Environmental Protection Agency
Region 2
New York, New York
September 2016

DECLARATION STATEMENT
RECORD OF DECISION AMENDMENT

SITE NAME AND LOCATION

Vineland Chemical Company Superfund Site
Cumberland County, New Jersey.

Superfund Site Identification Number: NJD002385664
Operable Unit 3 – Exposed Sediment/Soil of the Blackwater Branch Floodplain

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) Amendment documents the U.S. Environmental Protection Agency's (EPA) selection of a change in the remedy for the River Areas Sediment Operable Unit 3 (OU3) portion of the remedy which was originally selected for the Vineland Chemical Company Superfund Site (site) in a 1989 ROD. This ROD Amendment applies specifically to the exposed sediment/soil of the Blackwater Branch floodplain. The amended remedy is an interim action that will be revisited at a later date as additional knowledge is gained about conditions in the floodplain and the long-term effectiveness of the interim remedial actions selected in this ROD Amendment. The original remedy was, and this ROD Amendment remedy is, chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§ 9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting a remedy to address contamination at the site. The attached index (see Appendix III) identifies the items that comprise the Administrative Record upon which the amended remedy is based.

The New Jersey Department of Environmental Protection (NJDEP) was consulted on the proposed amended remedy in accordance with Section 121(f) of CERCLA, 42 U.S.C. § 9621(f), and NJDEP concurs with the amended remedy (see Appendix IV).

RATIONALE FOR AMENDMENT

The 1989 ROD selected the excavation and treatment of the exposed arsenic-contaminated sediment in the Blackwater Branch floodplain. This ROD Amendment changes this portion of the response action to implementation of in-situ (in-place) treatment technologies to prevent recontamination of the exposed sediment/soil, excavation of localized areas of sediment/soil in the Blackwater Branch floodplain that have significantly elevated concentrations of contaminants, and performance monitoring to assure the remedy is effective and to assess the need for additional in-situ treatment and/or excavation. This amended remedy is necessary as sediment sampling conducted between 2010 and 2015 demonstrated that groundwater discharging to the Blackwater Branch floodplain is recontaminating the sediment/soil in certain areas. A subsequent Remedial System Evaluation of the groundwater extraction and treatment system determined that in-situ treatment can immobilize arsenic in soil before it reaches the

Blackwater Branch floodplain. Based on this, EPA began implementation of a bench scale study and pilot testing program to evaluate the effectiveness of in-situ remediation technologies to prevent recontamination of the floodplain, and this ROD Amendment is based on the findings of the pilot study and EPA's general knowledge of the site.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this ROD Amendment, may present an imminent and substantial endangerment to public health, welfare or the environment.

DESCRIPTION OF THE SELECTED REMEDY AS AMENDED

The selected remedy described in this document addresses a discrete portion of OU3 of the site involving exposed sediment/soil of the Blackwater Branch floodplain near the former Vineland Chemical Company property on East Mill Road in the City of Vineland, Cumberland County, New Jersey. This is one of four remedial phases, or operable units, for the site. OU1 addressed the control of source material at the former Vineland Chemical Company plant site. OU2 addresses the management of the migration of contamination in groundwater; long-term operation and maintenance of the groundwater extraction and treatment system for this portion of the remedy is ongoing. OU3 addresses contamination associated with the sediment/soil in the river areas, including the Maurice River, the Blackwater Branch of the Maurice River and their associated floodplains. OU4 relates to Union Lake, an 870-acre impoundment on the Maurice River.

Pursuant to the 1989 ROD, EPA excavated the exposed sediment/soil of the Blackwater Branch floodplain, treated the sediment/soil through water wash extraction, and placed the treated material back in the excavated portions of the floodplain. The sludge from the treatment process was transported off-site for proper disposal, and the work was initiated after the groundwater (OU2) portion of the remedy was operating. The groundwater remedy began operation in the summer of 2001 and the floodplain excavation and treatment work was completed in December 2012. However, monitoring since that time has shown that certain areas of exposed sediment/soil of the Blackwater Branch floodplain have become recontaminated with arsenic above the cleanup goals identified in the 1989 ROD due to arsenic in groundwater reaching the sediment/soil during the ongoing implementation of the OU2 remedy.

The major components of this ROD Amendment include the following:

- Installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above remediation goals.
- Hot-spot excavations to remove exposed sediment/soil in the Blackwater Branch floodplain with contaminant concentrations above remediation goals.
- Performance monitoring to assure the remedy is effective and assess the need for additional in-situ treatment and/or excavation.

The in-situ technology used may vary across the affected areas and will depend on the geochemistry and subsurface conditions in each particular location. Examples of such technologies include air sparging in iron rich groundwater environments and iron chloride injection in addition to air sparging or peroxide injection in iron poor groundwater environments. In-situ technologies may also include pH adjustments and/or the installation reactive barriers. The in-situ treatment technology appropriate for each area of the site will be determined after further studies during remedial design.

In addition, the need for excavation of the exposed sediment/soil before and/or after in-situ treatment for each area of the site will be determined during the remedial design and further refined during implementation of the remedial action through performance monitoring.

This is considered an interim remedial action as it will be revisited at a future date as additional knowledge is gained about conditions in the sediment/soil and once the amended remedy's long-term effectiveness as a part of the remedy for all operable units of the site can be evaluated.

The environmental benefits of the amended remedy may be enhanced by consideration, during the remedy design or implementation, of technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy.

The estimated present-worth cost of the selected remedy is $14,897,663.

DECLARATION OF STATUTORY DETERMINATIONS

The selected amended remedy meets the requirements for remedial actions set forth in CERCLA Section121, 42 U.S.C. § 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatments (or resource recovery) technologies to the maximum extent practicable. In addition, Section 121 of CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances as a principal element (or requires a justification for not satisfying the preference). One of the main components of the selected remedy involves in-situ treatment that will reduce the mobility of contamination.

While this amended remedy will ultimately result in reduction in mobility of contaminant levels in sediment/soil and prevent recontamination, the remedy will take longer than five years to implement. As a result, the site will be reviewed at least once every five years until such time as remedial action objectives (RAOs) and remediation goals are attained and human health and the environment are protected under unrestricted site use.

This interim action is protective of human health and the environment and is intended to provide adequate protection until EPA evaluates its long-term effectiveness at a future date.

ROD AMENDMENT DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD Amendment. Additional information can be found in the Administrative Record for the site.

- Chemicals of concern and their respective concentrations may be found in the "Remedial Action Objectives" section.
- Baseline risk represented by the chemicals of concern may be found in the "Updated Risk Assessments" section.
- A discussion of remediation goals may be found in the "Remedial Action Objectives" section.
- Estimated capital, annual operation and maintenance (O&M) and total present worth costs are discussed in the "Description of Alternatives for ROD Amendment" section.
- Key factors that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) may be found in the "Comparative Analysis of Alternatives for ROD Amendment" and "Statutory Determinations" sections.

AUTHORIZING SIGNATURE

[signature]

Walter E. Mugdan, Director
Emergency & Remedial Response Division
EPA – Region 2

September 27, 2016
Date

DECISION SUMMARY

Operable Unit 3: Exposed Sediment/Soil of the Blackwater Branch Floodplain
Vineland Chemical Company Site
Cumberland County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2016

TABLE OF CONTENTS

PAGE

APPENDICES

APPENDIX I	FIGURES
APPENDIX II	TABLES
APPENDIX III	ADMINISTRATIVE RECORD INDEX
APPENDIX IV	STATE LETTER
APPENDIX V	RESPONSIVENESS SUMMARY

1.0 INTRODUCTION TO SITE AND STATEMENT OF PURPOSE

1.1 Site Name, Location and Description

The Vineland Chemical Company Site (site), U.S. Environmental Protection Agency (EPA) Superfund Site Identification Number NJD002385664, is located in the City of Vineland, Cumberland County, New Jersey.

The site is located in the northwestern portion of Vineland, which is in south central New Jersey, in an area of mixed industrial, low-density residential and agricultural properties (see Appendix I, Figures 1 and 2). The site is bordered to the north by other industrial properties and the Blackwater Branch, a perennial stream that flows westward to the Maurice River.

The Blackwater Branch of the Maurice River flows northeast to southwest, in proximity to, and partially through, the site itself. A floodplain lies immediately adjacent to the Blackwater Branch along the entire length of the tributary extending to the Maurice River.

The site is located in the Atlantic Coastal Plain physiographic province, which consists of a seaward-dipping wedge of unconsolidated sediment (sand, silt, clay, and gravel) that range in age from Cretaceous to Quaternary periods. Locally, the site is situated on a relatively level plain that slopes slightly from the southeast toward the northwest with topographic elevations that range from 65 to 75 feet above mean sea level.

Groundwater levels vary seasonally at the site with an average of approximately 10 feet below ground surface (bgs), and a typical minimum and maximum of between 4 and 19 feet bgs. When the groundwater treatment plant is not in operation, groundwater south of the Blackwater Branch moves in an east to west direction with groundwater discharging at several locations along Blackwater Branch. Under pumping conditions, the direction of flow is somewhat altered to a more southeast to northwest flow direction south of Blackwater Branch, and a northeast to southwest flow direction north of Blackwater Branch. Groundwater that is not captured by the recovery system discharges to Blackwater Branch.

Due to the large area, the different media affected by contamination, and the complexity of multiple areas and varying land uses at the site, EPA is addressing the cleanup of the site in several phases, or operable units (OUs). A Record of Decision (ROD) signed on September 28, 1989 divided the site into four OUs (Appendix I, Figure 3), and selected remedies to address each of the operable units.

Operable Unit 1 (OU1) consisted of the control of source material at the former Vineland Chemical Company plant site. To address arsenic-contaminated soil, EPA constructed a soil washing facility that processed up to 70 tons of excavated soil per hour. The facility processed over 400,000 tons of arsenic-contaminated soil and sediment, and the remaining waste was disposed of at a permitted off-site disposal facility. The soil remedy was completed in December 2014.

OU2 relates to management of the migration of groundwater contamination. To address contaminated groundwater, EPA constructed a system to pump and treat about two million gallons of contaminated groundwater daily. Operation of the facility began in the spring of 2000 and is ongoing. The pump-and-treat operation is capturing the majority of the flow of arsenic-contaminated groundwater from the plant site, and removing the arsenic through treatment. The treated groundwater continues to meet the site's cleanup goal. Operation of the pump-and-treat system was transferred to NJDEP in October 2014.

OU3 relates to contamination associated with the sediment/soil in the river areas, including the Maurice River, the Blackwater Branch of the Maurice River and their associated floodplains. To address the river areas, the 1989 ROD selected excavation/dredging of the Blackwater Branch soil and sediment, treatment of this material via water wash extraction, and placement of the treated material back in the excavated areas. Following this and implementation of the OU2 remedy, a three year monitoring period was to be initiated to see if natural river flushing would effectively address remaining contamination in the Maurice River. The excavation/dredging of the Blackwater Branch and its associated floodplain was completed in December 2012 and the three year monitoring period ended in August 2014.

OU4 of the site relates to Union Lake, an 870-acre impoundment on the Maurice River. The interim remedy for OU4 will be initiated once the upstream remedial activities have been completed. The remediation of the sediment in Union Lake involves excavation of the arsenic-contaminated sediment at the periphery of the lake, once they have been exposed by lowering the lake's water level. Sediment at the upper end of the lake above the submerged dam will be evaluated prior to dredging and an environmental assessment of the impact of dredging will be performed. Beach monitoring in Union Lake began in the early 2000s and will continue until it is concluded that there are no further unacceptable impacts to the lake. To date, no unacceptable risks to beach users have been identified.

1.2 Lead and Support Agencies

EPA is the lead agency and the NJDEP is the support agency.

1.3 Statement of Purpose

An amendment to the 1989 ROD is necessary because a fundamental change is being made to the portion of the OU3 remedy related to the exposed sediment/soil of the Blackwater Branch floodplain. This ROD Amendment documents the basis for this fundamental change. This ROD Amendment is issued in accordance with Section 117 of CERCLA and 40 CFR 300.435(c)(2)(ii) of the National Oil and Hazardous Substances Contingency Plan (NCP).

1.4 Community Participation/Availability of Documents

In compliance with Section 117 of CERCLA and NCP Section 300.435(c)(2)(ii), on July 22, 2016 EPA released the Proposed Plan for the amendment of the cleanup of the exposed sediment/soil of the Blackwater Branch floodplain and supporting documentation to the public for comments. EPA made these documents available to the public in the administrative record file maintained at the Vineland City Library, 1058 East Landis Avenue in Vineland, New Jersey and at the EPA Region 2 Superfund Records Center located at 290 Broadway, New York, New

York (see Appendix III). The administrative record file is also available online at www.epa.gov/superfund/vineland-chemical. EPA published a notice of availability of these documents in the *Press of Atlantic City* newspaper on July 22, 2016. The public comment period lasted 30 days and closed on August 22, 2016.

A public meeting was held on August 8, 2016, at the Vineland City Hall, 640 E Wood Street in Vineland, New Jersey to inform local officials and interested citizens about the Superfund process, to review the completed and planned remedial activities at the site, and to respond to questions from area residents and other attendees. Comments that were received by EPA at the public meeting and in writing during the public comment period are included in the Responsiveness Summary (see Appendix V).

The ROD Amendment and supporting documentation will become part of the Administrative Record for the site, in accordance with NCP 40 C.F.R. § 300.825 (a)(2). The Administrative Record Index is presented in Appendix III to this ROD Amendment.

2.0 SITE HISTORY AND CONTAMINATION, AND 1989 ROD SELECTED REMEDY

2.1 Site History and Contamination

The Vineland Chemical Company operated from 1949 to 1994 and produced arsenical herbicides and fungicides. There were seventeen buildings on the plant site, some of which were used by the Vineland Chemical Company for various manufacturing purposes.

As early as 1966, the New Jersey Department of Health observed untreated wastewater being discharged into unlined lagoons at the site. This wastewater was contaminated with arsenic at concentrations up to 67,000 parts per billion (ppb). Waste salts containing 1-2 percent arsenic were stored outside in uncovered piles. Precipitation dissolved some of these salts and carried them into the groundwater and eventually into nearby surface water bodies. Contaminated sediment was mapped 1.5 miles downstream in Blackwater Branch to its confluence with the Maurice River and then 7.5 miles downstream to Union Lake.

Between 1975 and 1976, Vineland Chemical was "fixating" the waste salts for disposal at the Kin-Buc Landfill. The process involved mixing the dried salts with ferric chloride and soda ash, reportedly reducing the solubility. The process was stopped in 1976 when the Kin-Buc Landfill voluntarily stopped accepting all chemical wastes, including the fixated salts. The company then resumed stockpiling the untreated waste salts on the soil surface at the plant site.

A court order issued on January 26, 1977 required Vineland Chemical to containerize the waste salts located in chicken coops and piles, and then store the drums in a warehouse off-site. In June 1979, another court order was issued for the disposal of the stored drums in an approved landfill. Removal and disposal of these drums were not completed until June 30, 1982.

Aerial photographs provided by EPA's Environmental Photographic Information Center, as well as conversations with Vineland Chemical Company employees, indicated several possible locations of historic contamination. A cleared area in the southwest corner of the site was previously occupied by two chicken coops. Sometime between November 1975 and March 1979, both coops were destroyed. These coops were reportedly used to store process chemicals and/or waste in the 1970s. The materials stored in the coops may have percolated into the groundwater. Photographs showed many locations containing mounded material and/or drums. These were observed in the lagoon area and along the plant road. The floors of the manufacturing buildings may also have been leaking arsenic compounds into the underlying sands for years. The original floors of the buildings were brick and were reportedly in need of repair. When the bricks were removed, the underlying soil was said to have contained crystalline waste from previous spills. It is not known whether the soil was removed when the floors were replaced.

In early 1992, EPA assessed the plant site conditions after being informed by the plant manager that the Vineland Chemical Company site would be abandoned. EPA found thousands of gallons of arsenic solutions stored in tanks and containers on the site. In June 1992, EPA secured the buildings and installed fences around soil areas containing high levels of arsenic. In addition, a fence was installed around the plant site to restrict trespassers. Removal of the hazardous materials stored in tanks and containers began in the fall of 1992. The company ceased operations, and the plant site buildings were abandoned in early 1994.

The site was added to the EPA's National Priorities List (NPL) in September 1984. A Remedial Investigation and Feasibility Study (RI/FS) was completed in 1989 to identify the types, quantities, and locations of contaminants, and to develop ways to correct the problems posed by the contaminants.

Potentially responsible parties (PRPs) identified for the site include the Vineland Chemical Company and its owners. In 1994, the PRPs entered into a judicial consent decree with EPA, fully resolving their liability. The Vineland Chemical Company no longer exists and the owners of the site are deceased.

2.2 Original (1989) ROD Selected Remedy

In September 1989, EPA issued a ROD for the entire site, with NJDEP concurrence. The major components of the 1989 ROD, as excerpted exactly from the Declaration Statement, are as follows:

Operable Unit One (Plant Site Source Control)

- In situ treatment, by flushing, of the arsenic-contaminated soil to reduce arsenic levels. Portions of the contaminated soil will be excavated and consolidated prior to the flushing action.

- Plant site remediation also includes closure of the two lined surface impoundments in compliance with the Resource Conservation and Recovery Act (RCRA), and decontamination of the former chicken coop storage buildings.

Operable Unit Two (Plant Site Management of Migration)

- Removal of arsenic-contaminated groundwater through pumping, followed by on-site treatment and reinjection of the treated groundwater to the aquifer at the maximum rate practicable. The remainder of the treated groundwater will be discharged to the Maurice River. A portion of the treated groundwater will also be used for the soil flushing action in Operable Unit One. The arsenic-contaminated sludge from the groundwater treatment process will be transported off-site for hazardous waste treatment and disposal. This action will effectively eliminate the source of arsenic into the Maurice River system.

Operable Unit Three (River Areas Sediment)

- Excavation and treatment of the exposed arsenic-contaminated sediment in the Blackwater Branch floodplain. Treatment will consist of a water wash extraction. The cleaned sediment will be redeposited in the excavated portion of the floodplain. The sludge from the extraction process will be transported off-site for hazardous waste treatment and disposal. Remediation will begin after the contaminated groundwater flow into the Blackwater Branch has been stopped.

- Dredging/removal and treatment, by water wash extraction, of the submerged arsenic-contaminated sediment in the Blackwater Branch adjacent to and downstream of the Vineland Chemical Company plant site. Prior to removing any sediment, an environmental assessment of the impact of dredging will be performed and a confirmation made that this sediment is a source of contamination to the river system. The treated sediment will be redeposited on undeveloped areas of the Vineland Chemical Company plant site. The sludge from the extraction process will be transported off-site for hazardous waste treatment and disposal.

- After stopping the flow of arsenic-contaminated groundwater from the Vineland Chemical Company plant site, a three year period for natural river flushing will be implemented. This will allow the submerged, arsenic-contaminated sediment in the Maurice River to be flushed clean through natural processes. If, after this period, the submerged sediment is no longer contaminated with arsenic above the action level, no remediation will be performed in the river. Similarly, if sediment contamination above the action level persists, but the observed or expected natural decontamination rate is consistent with an acceptable public health risk, no remediation will be performed. However, if contamination above the action level persists in some locations and is expected to remain at levels posing unacceptable health risks, those locations would be remediated.

- Remediation of the submerged Maurice River sediment will be performed, as necessary, by dredging and treatment with a water wash extraction. However, prior to removing any sediment, an environmental assessment of the impacts of dredging will be made. The treated sediment will be deposited on undeveloped areas of the Vineland Chemical Company plant site. The sludge from the extraction process will be transported off-site for hazardous waste treatment and disposal.

Operable Unit Four (Union Lake Sediment)

- Removal and treatment of arsenic-contaminated sediment on the periphery of Union Lake will be performed after the three year flushing period (if no remediation is performed in the Maurice River) or after remediation of the Maurice River (if this is necessary following the flushing period). Verification sampling will be conducted prior to remediation to confirm the locations of sediment contaminated above the action level for arsenic along the periphery of Union Lake.

- The arsenic-contaminated sediment on the periphery of Union Lake will be excavated after they are exposed by lowering the lake's water level. However, for the upper end of the lake above the submerged dam, prior to removing any sediment, an environmental assessment of the impact of dredging will be performed. The sediment will be treated by water wash extraction and the cleaned sediment returned to its approximate former locations in Union Lake. The sludge from the extraction process will be transported off-site for hazardous waste treatment and disposal.

- This is an interim remedy, since arsenic-contaminated sediment above health-based levels will remain in Union Lake. Therefore, periodic reviews will be conducted to determine whether contaminated sediment is redistributed, through natural processes, to the cleaned areas.

EPA also issued two Explanations of Significant Differences (ESDs) for the site, one in 1997 and one it 2001. The basic rationale and effect of these ESDs are as follows:

- 1997 ESD: During the pre-design investigation phase, borings were advanced through the floors of all the plant site buildings and paved areas. Samples were also collected from inside the buildings including the walls, floors, ceilings and equipment. Significant quantities of arsenic at elevated concentrations were discovered in some of the buildings and in the soil at depths down to the water table. On June 26, 1997, EPA approved an ESD which included the demolition and disposal of the plant site buildings and debris. The ESD also included an increase in volume of the contaminated plant site soil and changes in the groundwater treatment plant size and treatment process.

- 2001 ESD: In August 2001, EPA changed the in-situ soil flushing remedy to ex-situ soil washing, based on the results of treatability studies that concluded soil flushing was more effective at reducing arsenic concentrations to the clean-up goal of 20 mg/kg.

2.3 Implementation of the 1989 ROD Selected Remedy for OU3

The excavation and treatment of arsenic impacted sediment from the Blackwater Branch and its floodplain were carried out in four phases from 2006 through 2012. Phase 1 encompassed the area east of North Mill Road and adjacent to the chemical plant site. Phase 2 encompassed the area west of North Mill Road and east of Route 55. Phase 3 encompassed the area west of Route 55 and east of the Maurice River Parkway. Phase 4 encompassed the stream and floodplain west of the Maurice River Parkway to the Maurice River.

In each phase, the Blackwater Branch was diverted to a clean location before excavation of the contaminated material was performed. Once material with arsenic concentrations exceeding 20 milligrams/kilogram (mg/kg), the value identified in the 1989 ROD, was removed and either treated via soil washing or disposed of off-site, the excavated area was backfilled with clean material and stream flow was restored to the re-constructed stream channel.

Soon after arsenic excavation in the floodplain of Phases 1 and 2 was completed in 2009, iron staining along the banks and within the Blackwater Branch was observed in certain locations. Sediment and seep water samples collected between 2010 and 2015 demonstrated that groundwater that is discharging to the Blackwater Branch in certain areas is recontaminating the sediment due to localized geochemical conditions that result in the dissolved arsenic precipitating out as the groundwater discharges into the branch sediment.

3.0 BASIS FOR THE ROD AMENDMENT

An Amendment to the 1989 ROD is necessary because a fundamental change to the OU3 remedy is needed. Since implementation of the original OU3 remedy, new information has been collected to support a change from the technology selected in the 1989 ROD to one that EPA anticipates will address the recontamination that is occurring in the Blackwater Branch sediment/soil.

This new information is summarized as follows and discussed in more detail below:

- Sediment samples collected between 2010 and 2015 demonstrated that groundwater that is discharging to the Blackwater Branch floodplain in certain areas is recontaminating the sediment/soil.

- New information collected as part of a Remedial System Evaluation (RSE) of the pump-and-treat system completed in 2011 found that the system provided reasonably good containment of the contaminated groundwater plume, but that concentration reduction rates had slowed to asymptotic conditions over the past 10 years. It was concluded that due to existing geochemical conditions, active in-situ treatment for arsenic immobilization could play an important role in cost effectively containing the groundwater plume and optimizing the remedial processes at the site.

- Bench scale studies and pilot tests of in-situ treatment technologies have been conducted and are ongoing. Thus far, in-situ treatment has been shown to be effective in preventing recontamination of the sediment/soil of the Blackwater Branch floodplain, and is expected to be effective in other parts of the impacted floodplain.

- An updated human health risk assessment was conducted, which concluded that the concentrations of arsenic accumulating in the floodplain continue to be associated with unacceptable levels of risk. Likewise, an ecological screening assessment concluded that arsenic is accumulating in the floodplain at concentrations that pose a potential risk to ecological receptors.

3.1 Sediment Sampling

Soon after arsenic excavation in the floodplain of Phases 1 and 2 was completed in 2009, iron staining along the banks and within the Blackwater Branch was observed in certain locations. Sediment and seep water samples taken at a few of these iron-stained locations were analyzed in 2010 to determine if these iron-stained sediment also contained arsenic. Phase 1 samples were taken after excavation, backfilling and flow had been restored to the channel. Phase 2 samples were collected after excavation and backfilling in the floodplain had occurred, but before flow was restored to the original creek channel.

The sediment samples that were co-located with the seep samples contained arsenic just above the floodplain sediment cleanup goal of 20 mg/kg as identified in the 1989 ROD. These results provided evidence that arsenic is seeping into the Blackwater Branch floodplain at some of the locations sampled even with the pump and treat system in operation, contaminating exposed sediment/soil by precipitating out once it discharges. The OU3 remedy was selected based on the assumption that groundwater discharging into the Blackwater Branch floodplain would not impact the exposed sediment/soil.

Further sampling of surface sediment was performed between 2011 and 2012 along Phases 2, 3 and 4, soon after stream restoration and prior to re-diverting the surface water back to the stream. Samples were biased toward the iron-stained sediment. Results indicated that arsenic in surface sediment samples accumulated soon after restoration and concentrations exceeded 20 mg/kg in exposed sediment/soil. Due to extensive arsenic exceedances along the Phase 4 segment of the Blackwater Branch, surface water was not re-diverted back to this section of the Blackwater Branch. The Blackwater Branch was eventually re-diverted back to a stream alignment that was similar to the original but followed an alternate path around the areas where the arsenic exceedances were encountered.

Additional sediment sampling was conducted in Phases 1 and 2 between 2013 and 2015. Samples were biased to locations that were iron-stained and were collected from floodplain areas as well as locations near the banks of the Blackwater Branch where sediment is likely to be exposed during periods of low water level conditions. During this time period, operation of the pump and treat system varied between full pumping, no pumping and partial pumping. Concentrations of arsenic in sediment samples exceeded 20 mg/kg while the pump and treat system was fully operational as well as when the pump and treat system was shut down.

The sediment samples collected between 2010 and 2015 demonstrated that groundwater that is discharging to the Blackwater Branch in certain areas is recontaminating the sediment due to localized geochemical conditions that result in the dissolved arsenic precipitating out as the groundwater discharges into the branch sediment. Over time, larger areas of sediment may become recontaminated. It should be noted that despite the elevated arsenic concentrations in the floodplain, surface water arsenic concentrations have not been found to be elevated.

3.2 Remedial System Evaluation (2011)

In 2011, EPA performed an optimization study to evaluate the efficiency of the pump-and-treat groundwater remediation system. Although this study was focused on OU2 (groundwater), it impacts OU3. The RSE focused on maximizing the efficiency of the pump-and-treat system, while maintaining protection of human health from exposure to site contaminants; expediting the cleanup; and identifying key steps to achieve the RAOs defined in the 1989 ROD. In the RSE it was recommended that due to existing geochemical conditions, active in-situ treatment for arsenic immobilization could play an important role in cost effectively containing the groundwater plume.

3.3 Bench Scale Studies

Once EPA determined that implementation of the original OU3 remedy would not prevent recontamination of the floodplain sediment/soil and the RSE recommended immobilization as a potential technology for the site, preliminary bench scale testing was conducted to evaluate the viability of in-situ treatment as a method of controlling recontamination. In-situ treatments evaluated at the bench scale focused on creating conditions for which the accumulation of arsenic in sediment would be unfavorable either by reducing the movement of arsenic to the sediment/soil of the floodplain or by reducing the availability of areas onto which arsenic can accumulate through bonding with the sediment.

Results of the bench scale studies indicated that several methods of in-situ treatment can reduce arsenic accumulation in sediment/soil so that concentrations in the Blackwater Branch floodplain would remain below cleanup goals. These methods include in-situ treatment with oxygen (such as by air sparging or the use of peroxide), in-situ treatment with iron, and/or in-situ pH adjustment.

In 2015, pilot testing of in-situ treatment options was initiated, and the preliminary results of this testing are favorable. Because the results show that the in-situ treatment is working, the pilot study will continue and will remain operational until the amended remedy is implemented.

3.4 Updated Risk Assessments

Human Health Risk Assessment

As part of the July 2016 Focused Feasibility Study (FFS) that supports this ROD Amendment, a four-step human health risk assessment process was used for assessing site-related cancer risks and noncancer health hazards from exposure to arsenic in the exposed sediment/soil of the Blackwater Branch floodplain. The four-step process is comprised of:

- *Hazard Identification* – this step identifies the chemicals of concern (COCs) at a site based on several factors such as toxicity, frequency of occurrence, and concentration;
- *Exposure Assessment* – this step estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by

which humans are potentially exposed (i.e., ingestion and dermal contact with contaminated soil);

- *Toxicity Assessment* – this step identifies the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and

- *Risk Characterization* – this step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. During this step, contaminants with concentrations that exceed federal Superfund guidelines for acceptable exposure are identified. These guidelines are 10^{-4} to 10^{-6}, or one-in-ten-thousand to one-in-a-million excess occurrences for cancer, and a Hazard Index (HI) of greater than 1 for noncancer health hazards. Contaminants with concentrations that exceed these guidelines are then considered COCs for a site and are typically those that will require remediation. The uncertainties associated with the risk calculations are also evaluated under this step.

Three separate areas with contamination in the floodplain of the Blackwater Branch were identified with unique geochemical conditions and were designated Areas A, B, and C (Appendix I, Figure 4). The maximum detected arsenic concentrations in all three of these areas of the Blackwater Branch floodplain exceed the site cleanup level of 20 mg/kg for arsenic in exposed sediment/soil by an order of magnitude or more. Additionally, the 2016 supplemental risk assessment concluded that the maximum detected arsenic concentrations in these areas are greater than the health-based regional screening level (RSL) for arsenic, which indicates the potential for unacceptable risk and adverse health effects from recreational exposure to exposed Blackwater Branch sediment. The RSL uses standardized equations that combine exposure information and assumptions with available toxicity data.

A semi-quantitative screening evaluation was conducted for Area C of the Blackwater Branch floodplain. The risk evaluation for Area C is summarized in Appendix II, Tables 1 through 6. The results indicate that the current remedy is not protective of human health for a future recreator. The estimated cancer risk for a child and adult recreator utilizing the Blackwater Branch in Area C would equal 3×10^{-4}, exceeding EPA's acceptable risk range of 10^{-6} to $10^{-4.}$ The noncancer hazard estimates for a child and adult recreator in Area C are 5 and 0.5, respectively, with the child recreator exceeding EPA's noncancer hazard index of 1. These conclusions support those in the 1989 HHRA. Any current site user (e.g., treatment plant worker or trespasser) would have less frequent exposures, and thereby lower risks, than these future receptors.

Ecological Risk Assessment

A different approach was used in evaluating ecological risk associated with contamination in the exposed sediment/soil of the Blackwater Branch floodplain in comparison to the evaluation of human health risks. As is stated above, maximum concentrations of arsenic in all three areas of the Blackwater Branch floodplain exceed the site 1989 cleanup level of 20 mg/kg for arsenic in exposed sediment/soil by an order of magnitude or more. As such, an evaluation was conducted to determine whether cleanup of the floodplain to concentrations below the 1989 ROD goal would be protective of the environment.

The floodplain soil is considered to be representative of a terrestrial environment, thus concentrations of arsenic were compared to EPA's Ecological Soil Screening Level (Eco-SSLs), which are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil. As such, these values are presumed to provide adequate protection of terrestrial avian and mammalian receptors. The EPA Eco SSLs for arsenic are 18 mg/kg for plants, 43 mg/kg for avian receptors and 46 mg/kg for mammalian receptors.

Comparison of these screening levels to the 1989 ROD goal of 20 mg/kg for arsenic shows that this value is protective for avian and mammalian receptors. The only ecological value that is lower than 20 mg/kg is the value that was derived to be protective to plants (18 mg/kg). However, 18 mg/kg is below what is considered background for arsenic (20 mg/kg in 1989, 19 mg/kg currently) and is not considered achievable under site-specific conditions. Conversely, since concentrations above 46 mg/kg are present, this review shows that there is a potential risk to ecological receptors.

Conclusion

Based on the new information summarized above, the current remedy has not effectively mitigated the risks to recreators and ecological receptors, and further action is warranted to protect human health and the environment. As a result, new alternatives to address the exposed sediment/soil of the Blackwater Branch floodplain portion of OU3 of the site were evaluated in an FFS.

4.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives are specific goals to protect human health and the environment. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance and site-specific risk-based levels and background (i.e., reference area) concentrations. The 1989 ROD identified the following RAO for the sediment in OU3:

- Minimize public exposure, either through containment, removal, or institutional controls, for those areas with unacceptably high sediment arsenic concentrations.

This overall RAO for OU3 remains in effect. The specific RAOs for the selected remedy described in this ROD Amendment are:

- Reduce concentrations of arsenic in the exposed sediment/soil in the Blackwater Branch floodplain to below acceptable levels of risk.

- Prevent recontamination of exposed sediment/soil of the Blackwater Branch floodplain from site-related groundwater contamination.

As additional knowledge is gained about conditions in the sediment/soil in this area, and the long-term effectiveness of the amended remedy is evaluated, EPA's expectation is that the remedy described in this ROD Amendment will be revisited at a future date. Therefore, this action is considered an interim remedial action.

Remediation Goal

EPA has adopted the preliminary remediation goal identified in the Proposed Plan as the final Remediation Goal (RG) for OU3 of the site. The soil remediation goal for arsenic, the COC at the Site, is consistent with New Jersey Residential Direct Contact Soil Remediation Standard (RDCSRS). The remediation goal for OU3 is as follows:

Constituent in Soil	Cleanup Goal (mg/kg)
Arsenic	19

The 1989 ROD identified a Remediation Goal of 20 mg/kg for arsenic in exposed sediment/soil of the Blackwater Branch floodplain. Since then, the state of New Jersey has conducted a much more robust study of statewide levels of arsenic in soil, and from this study a statewide concentration of 19 mg/kg has been established. EPA has evaluated the protectiveness of 19 mg/kg and the Remediation Goal for arsenic in the exposed sediment/soil has been modified to meet the current New Jersey RDCSRS.

5.0 DESCRIPTION OF ALTERNATIVES FOR ROD AMENDMENT

The remedial alternatives considered for this ROD Amendment are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance (O&M) costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent. Since these are considered interim remedies, a 10-year time interval was evaluated. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy or procure contracts for design and construction. Detailed information regarding the alternatives can be found in the 2016 FFS.

Alternative 1 – No Further Action

The NCP requires that a "No Action" alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no further action would be implemented, and the current status of the site would remain unchanged. A Classification Exception Area for the site already exists to restrict use of groundwater. Signs are posted in accessible areas of Blackwater Branch and the Maurice River advising the public that sediment is contaminated with arsenic and there are risks associated with prolonged exposure of arsenic. With the exception of the existing security fences, engineering controls would not be implemented to prevent site access or exposure to site contaminants.

Total Capital Cost:	*$0*
Annual O&M:	*$0*
Present Worth Cost:	*$0*
Construction Timeframe:	*0 years*

Alternative 2 – Ongoing Hot Spot Excavation

This alternative consists of periodic excavation and off-site disposal of the exposed sediment/soil of the Blackwater Branch floodplain as the arsenic concentrations exceed the remediation goals. Excavated sediment/soil would be transported and disposed of off-site.

The sediment/soil would be sampled to determine if they need to be disposed of as either hazardous waste or non-hazardous waste. Treatment of sediment/soil, if needed, would be conducted at and by the approved disposal facility.

Total Capital Cost:	*$1,160,646*
Annual O&M:	*$4,642,584*
Present Worth Cost:	*$33,768,213*
Construction Time Frame:	*Constant over 10 years*

Alternative 3 – In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring

This alternative consists of installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above remediation goals, hot-spot excavations to remove exposed sediment/soil in the Blackwater Branch floodplain above remediation goals, and performance monitoring to assure the remedy is effective and assess the need for additional in-situ treatment and/or excavation. In-situ technologies are those technologies that are implemented in place, rather than removing the contamination and treating it.

The in-situ technology used may vary across the site and will depend on the geochemistry and subsurface conditions in each particular location. Examples of such technologies include air sparging in iron rich groundwater environments and iron chloride injection, in addition to air sparging or peroxide injection, in iron poor groundwater environments. In-situ technologies may also include pH adjustments and/or the installation of material into the ground which will intercept the groundwater flow and passively capture the contamination, also known as 'reactive barriers'. Final selection of the in-situ treatment technology appropriate for each area of the site will be made after further studies during remedial design.

In addition, the need for excavation of the exposed sediment/soil before and/or after in-situ treatment for each area of the site will be determined during the remedial design and further refined during implementation of the remedial action through performance monitoring.

Total Capital Cost: *$9,988,488*
Annual O&M: *$745,569*
Present Worth Cost: *$14,897,663*
Construction Time Frame: *1 year*

Change in Expected Outcome

Both the 1989 ROD and the ROD Amendment have the same objective for OU3 sediment/soil of the Blackwater Branch floodplain: reducing contaminant levels to below federal and state standards. As a result, there is no change to the expected outcome that will result from this ROD Amendment. However, the amended remedy will remove the recontaminated exposed sediment/soil and prevent any more recontamination of the exposed sediment/soil in the Blackwater Branch and its floodplain so that the contamination levels will remain below federal and state standards.

The 1989 ROD identified a Remediation Goal of 20 mg/kg for arsenic in exposed sediment/soil in the Blackwater Branch floodplain. However the Remediation Goal for arsenic in the exposed sediment/soil has been modified to meet the current New Jersey RDCSRS of 19 mg/kg.

6.0 COMPARATIVE ANALYSIS OF ALTERNATIVES FOR ROD AMENDMENT

In selecting a remedy for a site, EPA considers the factors set forth in Section 121 of CERCLA 42 U.S.C. § 9621, and conducts a detailed analysis of the viable remedial alternatives pursuant to Section 300.430(e)(9) of the NCP, 40 C.F.R § 300.430(e)(9), EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER Directive 9355.3-01, and EPA's A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

A comparative analysis of these alternatives based upon the nine evaluation criteria noted herein follows.

Threshold Criteria *– The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Alternative 1 does not protect human health and the environment because no action is taken to prevent exposure to sediment/soil that exceeds risk based cleanup goals for arsenic.

Alternative 2 is protective of human health and the environment because sediment/soil is removed as it reaches arsenic concentrations that exceed the risk based cleanup goals.

Alternative 3 is protective of human health and the environment because in-situ treatment systems are installed and operated that prevent recontamination of sediment/soil with arsenic, and sediment/soil currently exceeding risk based arsenic concentrations are removed and disposed of off-site.

2. Compliance with applicable or relevant and appropriate requirements (ARARs)
Section 121 (d) of CERCLA, 42 U.S.C. § 9621(d), and Section 300.430(f)(1)(ii)(B) of the NCP, 40 CFR §300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver.

A complete list of ARARs can be found in Appendix II, Table 7.

Alternative 1 would not comply with ARARs in that it would leave exposed sediment/soil in place that exceed New Jersey RDCSRS and pose unacceptable risk to human health and the environment.

Alternative 2 provides compliance with chemical-specific ARARs by removal of sediment/soil that exceeds New Jersey RDCSRS. Location-specific ARARs and Action-specific ARARs would both be met by proper design and implementation of the respective components such as general construction standards and waste handling requirements. The Location-specific ARARs and Action-specific ARARs for the disposal phase would be met with proper waste management on-site, and selection of the disposal facility.

Alternative 3 provides compliance with chemical-specific ARARs by removing contaminated soil above New Jersey RDCSRS and in-situ treatment that would prevent groundwater from recontaminating the sediment/soil. Location-specific ARARs and Action-specific ARARs would both be met by proper design and implementation of the respective components such as general construction standards and waste handling requirements. The Location-specific ARARs and Action-specific ARARs for the disposal phase would be met with proper waste management on-site, and selection of the disposal facility.

***Primary Balancing Criteria** – The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors by which tradeoffs between response measures are assessed so that the best options will be chosen, given site-specific data and conditions.*

3. Long-Term Effectiveness and Permanence
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Although the three alternatives are interim remedial actions, they were evaluated for long-term effectiveness and permanence. This interim remedy is intended to be protective of human health and the environment until EPA decides on a permanent remedy for this OU.

Alternative 1 does not provide adequate controls of risks to human health over the long-term because there is no mechanism to prevent future exposure.

Alternative 2 is only effective in the long-term with a high level of constant maintenance. It does not treat the source of contamination, and although steps would be taken to protect the surrounding community, there would be nearly continuous operation of construction equipment and hauling of contaminated soil off-site for an indefinite period of time.

Alternative 3 is effective in the long-term in that it prevents recontamination of the exposed sediment/soil in the Blackwater Branch floodplain.

4. Reduction of Toxicity, Mobility, or Volume through Treatment
Reduction in 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.

Alternative 1 would not reduce the toxicity, mobility or volume of contaminated soil, since the soil would remain in place.

Alternative 2 would not provide reduction of toxicity, mobility, or volume of contamination through treatment.

Alternative 3 does not reduce the overall volume of arsenic but does reduce the mobility of arsenic in the groundwater, which reduces the volume entering the Blackwater Branch floodplain. This effectively reduces the toxicity of the groundwater entering the Blackwater Branch floodplain.

5. Short-Term Effectiveness
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.

Alternative 1 poses no short-term adverse impacts to the community.

Alternative 2 construction and implementation activities would be frequent and would have almost continuous impact on the local community with truck traffic to haul contaminated sediment/soil for off-site disposal.

Alternative 3 would have some impacts on the nearby community due to truck traffic to haul contaminated sediment/soil off-site and drilling activities to install the in-situ treatment systems. However, these impacts would be relatively short term and ongoing long term treatment activities at the site are expected to have minimal impact to the community.

Both alternatives would result in some short-term impacts to the community, in the form of vehicular (truck) traffic and noise and dust from construction/excavation activities, although Alternative 2 would generate less truck traffic than Alternative 3. Traffic, noise, and dust impacts could be mitigated to some extent by limiting the construction schedule to daytime hours on weekdays or other timing as specified by local ordinance. Perimeter air monitoring and dust control measures would be required to address concerns over exposure to dust during activities.

6. Implementability
Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternative 1 requires no implementation.

Alternative 2 can be easily implemented. There are no special techniques, materials, or labor required to implement Alternative 2.

Alternative 3 is administratively and technically feasible; however, implementation of Alternative 3 would take a greater level of effort than Alternative 2 because it requires the design of an in-situ treatment component.

7. Cost
Cost includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent (This is a standard assumption in accordance with EPA guidance).

The estimated capital cost, operation and maintenance (O&M), and present worth costs are discussed in detail in EPA’s FFS. The cost estimates are based on the best available information. Alternative 1 has no cost because no activities are implemented.

The estimated capital, O&M present-worth cost over a ten year period, and total present-worth costs for each of the alternatives are as follows:

Cost Summary	Capital Cost	Annual O&M	Performance Monitoring	10-year Present Worth
Alternative 1: No Further Action	$0	$0	-	$0
Alternative 2: - Ongoing Hot Spot Excavation [1]	$1,160,646	$4,642,584	-	$33,768,213
Alternative 3: In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring [2]	$9,988,488	$745,569	$213,438	$14,897,663
Alternative 3: Year 2	-	$557,670	$135,461	-
Alternative 3: Years 3-10	-	$557,670	$95,663	-

[1] $1,160,646 is for one time excavation of all areas. $4,642,584 annual cost is excavation every 3 months.
[2] Capital Cost includes installation of in-situ remedies in Areas A, B, and C and one time excavation of hotspots.

***Modifying Criteria** – The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

8. State Acceptance
State Agency acceptance considers whether the State and/or Support Agency agrees with EPA's analyses and recommendations.

The State of New Jersey concurs with the selected remedy. A letter of concurrence is attached in Appendix IV.

9. Community Acceptance
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.

On August 8, 2016, EPA held a formal public meeting on the proposed plan for this OU. All written and oral comments are addressed in detail in Appendix V, which is the Responsiveness Summary for this ROD Amendment. No comments received during the comment period for the proposed plan expressed disagreement with EPA's preferred alternative for this OU at the site.

7.0 SELECTED AMENDED REMEDY

Based upon the requirements of CERCLA, the results of the site investigations, the detailed analysis of the alternatives, and public comments, EPA has determined that Alternative 3 (In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring) satisfies the requirements of Section 121 of CERCLA, 42 U.S.C. § 9621, and provides the best balance of tradeoffs among the remedial alternatives with respect to the NCP's nine evaluation criteria, 40 C.F.R. § 300.430(e)(9).

The major components of this ROD Amendment for OU3 include:

- Installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above Remediation Goals.
- Excavation of localized areas of sediment/soil in the Blackwater Branch floodplain with concentrations of contaminants above Remediation Goals.
- Performance monitoring to assure the remedy is effective and assess the need for additional in-situ treatment and/or excavation.

This alternative consists of installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above remediation goals, excavation of localized areas of sediment/soil in the Blackwater Branch floodplain with concentrations of contaminants above remediation goals, and performance monitoring to assure the remedy is effective and assess the need for additional in-situ treatment and/or excavation.

The in-situ technology that will be used depends on the geochemistry and subsurface conditions in each particular location. The actual technology will be selected during the Remedial Design. For the purposes of cost estimation the following were used as representative technologies: air sparging in iron rich groundwater environments; iron chloride injection in addition to air sparging in iron poor groundwater environments; sodium bicarbonate or sodium hydroxide injections for pH adjustments. As noted above, the final selection of the in-situ treatment technology appropriate for each area of the site will be made after further studies during remedial design.

This is considered an interim remedial action that will be revisited at a future date once the long-term effectiveness as a part of the remedy for all operable units of the site is evaluated. Additional ROD Amendments, for this OU or others, may be warranted in the future. This selected interim remedy will ensure that recontaminated sediment/soil will be remediated to levels that are protective of human and ecological health.

8.0 STATUTORY DETERMINATIONS

CERCLA Section 121(b)(1), 42 U.S.C. § 9621(b)(1), mandates that remedial actions be protective of human health and the environment, be cost-effective, and use permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, and contaminants at a site permanently and significantly. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified.

EPA has determined that the selected remedy complies with the CERCLA and NCP provisions for remedy selection, meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. These provisions require the selection of remedies that are protective of human health and the environment, comply with ARARs (or justify a waiver from such requirements), are cost-effective, and 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 that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances as a principal element (or justify not satisfying the preference). The following sections discuss how the selected remedy meets these statutory requirements. The State of New Jersey concurs with the selected remedy.

8.1 Protection of Human Health and the Environment

The selected remedy, Alternative 3, will adequately protect human health and the environment through a combination of excavation, in-situ treatment, and performance monitoring. The selected remedy will eliminate all significant direct-contact risks to human health and the environment associated with contaminated exposed sediment/soil of the Blackwater Branch and its floodplain. This action will result in the reduction of exposure levels to acceptable risk levels within EPA's generally acceptable risk range of 10^{-4} to 10^{-6} for carcinogens and below a HI of 1.0 for noncarcinogens. Implementation of the selected remedy will not pose unacceptable short-term risks.

8.2 Compliance with ARARs

The selected remedy complies with Chemical-specific, Location-specific and Action-specific ARARs. The ARARs for the selected interim OU3 remedy include the chemical-specific New Jersey Residential Direct Contact Soil Remediation Standards (NJAC 7:26D), the location-specific New Jersey Flood Hazard Control Act (NJAC 7:13) and the action-specific Resource Conservation and Recovery Act (42 USC 6901 et seq.; 40 CFR 107, 171-177). A complete list of the ARARs, TBCs and other guidance that concern the selected remedy is presented in Appendix II, Table 7.

8.3 Cost-Effectiveness

EPA has determined that the selected remedy is cost-effective and represents reasonable value for the money to be spent. A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP § 300.4309f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e. were both protective of human health and ARAR-compliant). Overall effectiveness is based on the evaluations of long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness was then compared to costs to determine cost-effectiveness.

Each of the alternatives were subjected to a detailed cost analysis. In that analysis, capital, annual O&M, and performance monitoring costs were estimated and used to develop present-worth costs. The estimated present worth cost of the selected soil remedy for OU3 is $14,897,663, which is less expensive than Alternative 2. The selected remedy is cost-effective as it has been determined to provide the greatest overall protectiveness for its present-worth cost.

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

EPA has determined that the amended remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for this OU. Of those alternatives that are protective of human health and the environment and comply with ARARs (or provide a basis for invoking an ARAR waiver), EPA has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, the bias against off-site disposal without treatment, and State/support agency and community acceptance.

8.5 Preference for Treatment as a Principal Element

By utilizing in-situ methods to prevent recontamination of the sediment/soil, the amended remedy addresses contamination posed by the site through the use of treatment technologies. By utilizing treatment as a significant portion of the remedy the statutory preference for remedies that employ treatment as a principal element is satisfied.

8.6 Five-Year Review Requirements

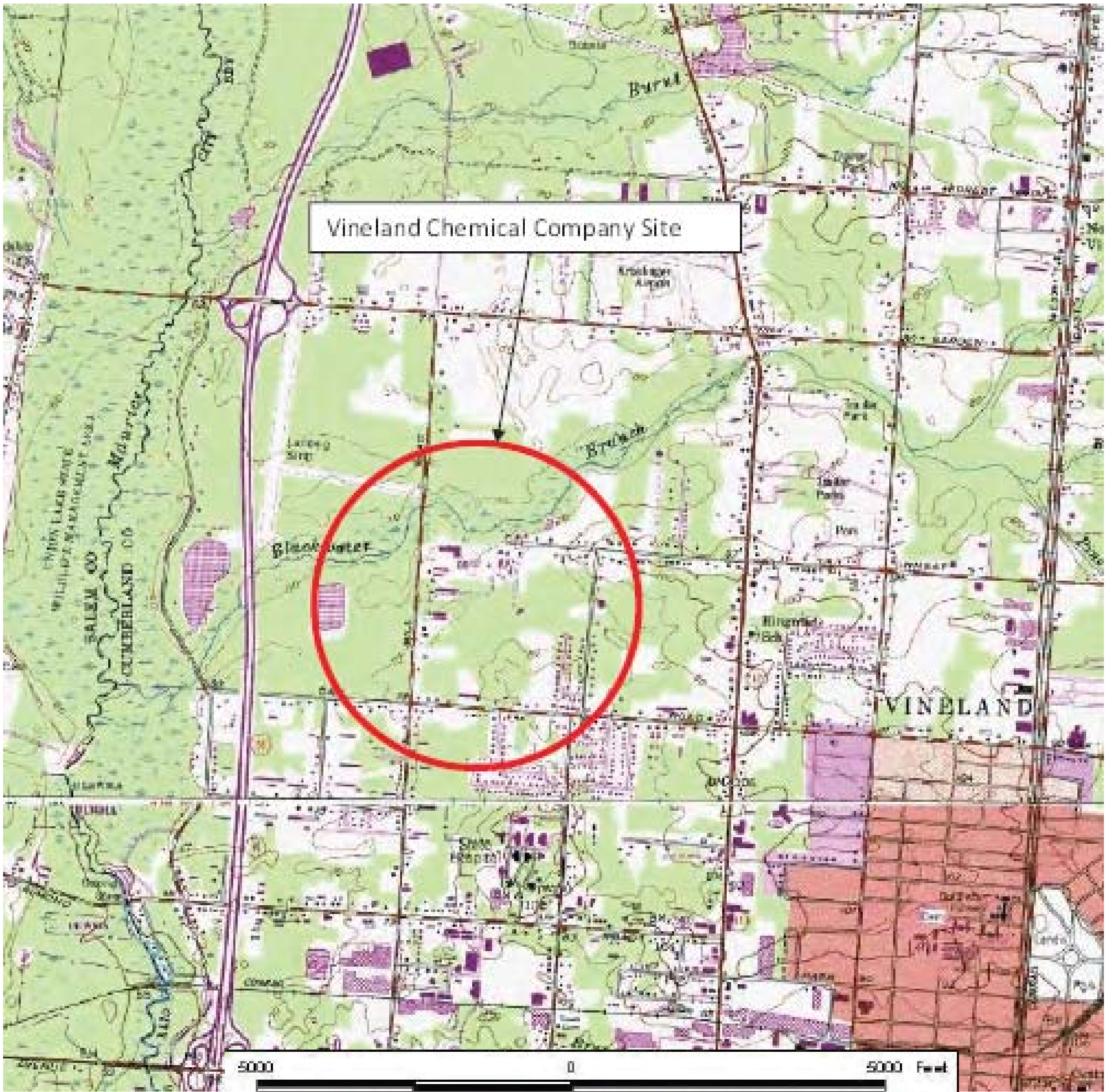
While this amended remedy will ultimately result in reduction of contaminant levels in sediment/soil to levels that would allow for unlimited use and unrestricted exposure, it will take longer than five years to achieve these levels. As a result, the site will be reviewed at least once every five years until such time as RAOs and remediation goals are attained and human health and the environment are protected with unrestricted use.

9.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU3 of the Vineland Chemical Company site was released for a public comment period on July 22, 2016. The public comment period ran until August 22, 2016. The Proposed Plan identified Alternative 3 (In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring) as the preferred alternative for OU3 of the site. EPA reviewed all written (including electronic formats such as e-mail) and verbal comments submitted during the public comment period and has determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, are necessary or appropriate.

APPENDIX I

Figures



Vineland Chemical Company
Superfund Site

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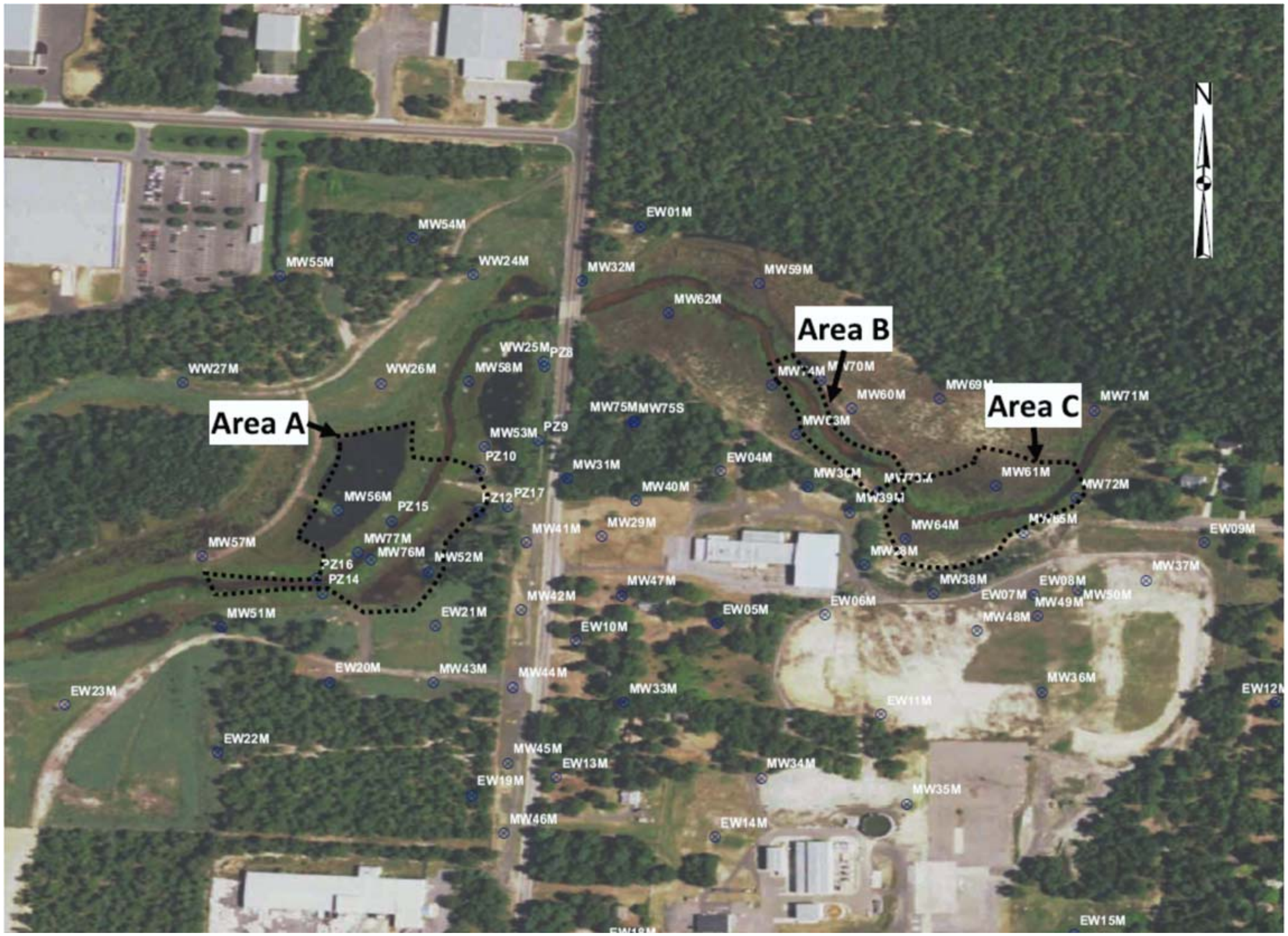
Figure 1: Site Location

Vineland Chemical Company
Superfund Site

Figure 2: Site Overview

Vineland Chemical Company
Superfund Site

Figure 3: Operable Units



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Vineland Chemical Company
Superfund Site

Figure 4: Delineation of Areas A, B, and C

APPENDIX II

Tables

TABLE 1
Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Exposed Sediment

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Blackwater Branch Area C	Arsenic	1	1,470	mg/kg	100%	1,470	mg/kg	Maximum

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for the COCs in exposed sediment. The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

TABLE 2
Selection of Exposure Scenarios

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis
Future	Sediment	Exposed Sediment	Blackwater Branch Area C	Recreator	Adult and Child (birth to <6 years)	Ing/Der/Inh	Quantitative

Ing – Ingestion

Der – Dermal

Inh - Inhalation

Summary of Selection of Exposure Pathways

This table describes the exposure pathways that were evaluated for the risk assessment. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 3
Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Arsenic	Chronic	3.0E-04	mg/kg-day	95%	3.0E-04	mg/kg-day	Skin	3	IRIS	9/1/1991

Key

IRIS: Integrated Risk Information System

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs).

TABLE 4
Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Arsenic	1.5E+00	mg/kg-day	1.5E+00	mg/kg-day	A	IRIS	06/01/95

Key:

A: Known Human Carcinogen
IRIS: Integrated Risk Information System

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern. Toxicity data are provided for both the oral and dermal routes of exposure.

TABLE 5

Risk Characterization Summary - Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Recreator
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Sediment	Exposed Sediment	Blackwater Branch Area C	Arsenic	Skin	4.0E-01	8.5E-02	5.5E-04	4.9E-01

Scenario Timeframe: Future
Receptor Population: Recreator
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Dermal	Inhalation	Exposure Routes Total
Sediment	Exposed Sediment	Blackwater Branch Area C	Arsenic	Skin	4.0E+00	5.1E-01	5.5E-04	**4.8E+00**

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for exposure to groundwater containing site-related chemicals. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Recreator
Receptor Age: Lifetime (Adult/child)

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Dermal	Inhalation	Exposure Routes Total
Sediment	Exposed Sediment	Blackwater Branch Area C	Arsenic	2.2E-04	3.1E-05	1.3E-08	**2.5E-04**

Summary of Risk Characterization – Carcinogens

The table presents site-related cancer risks for groundwater exposure. As stated in the National Contingency Plan, the point of departure is 10^{-6} and the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. The cancer risk from arsenic in surface soil exceeds the acceptable risk range, indicating an unacceptable risk from residential exposure to soil.

TABLE 7
ARARs and To Be Considered (TBC) Criteria

CHEMICAL-SPECIFIC ARARS OR TBC CRITERIA				
REGULATOR	**CRITERION**	**CITATION**	**DESCRIPTION**	**COMMENTS**
NJ Statutes and Rules	Remediation Standards Rule	NJAC 7:26D	Establishes minimum remediation standards for direct contact exposure to soil.	The Residential Direct Contact Soil Remediation Standard for Arsenic is 19 mg/kg
Federal Acts and Regulations	OSWER Guidance for Developing Ecological Soil Screening Levels	OSWER 9285.7.55	Guidance for deriving risk based eco-SSLs for soil contaminants of ecological concern.	May be used to screen soil contaminants to determine if further ecological study is warranted.
Federal Acts and Regulations	OSWER Soil Screening Guidance	OSWER 9285.7.55	Guidance for developing site specific soil screening levels.	May be used to identify areas of soil contamination.

LOCATION-SPECIFIC ARARS OR TBC CRITERIA				
REGULATOR	**CRITERION**	**CITATION**	**DESCRIPTION**	**COMMENTS**
NJ Statutes and Rules	Flood Hazard Control Act	NJAC 7:13	Floodplain Use and Limitations which establishes limits on land development within flood hazard areas	Pertinent to activities that may occur within the floodplain.
NJ Statutes and Rules	Freshwater Wetlands Protection Act	NJSA 13:9B-1 et seq	Requires permits for regulated activity disturbing freshwater wetlands	Potentially applicable for construction activities performed in the vicinity of a freshwater wetland
NJ Statutes and Rules	Endangered Plant Species List Act	NJSA 13:1B et seq.	Establishes the requirement to protection threatened and endangered plant species in New Jersey by developing and adopting a list	
NJ Statutes and Rules	Endangered and Non-Game Species Conservation Act	NJSA 23:2A-1	Standards for the protection of Federal and NJ threatened and endangered species	
NJ Statutes and Rules	Stream Encroachment Permit	N.J.S.A. 58:16A-50 et seq.; N.J.A.C. 7:8-3.15	Construction of structures and placement of fill within flood hazard areas including floodplains and floodways	Potentially applicable for construction activities performed in floodplains and floodways (e.g., treatment facilities)
Federal Acts and Regulations	National Environmental Policy Act (NEPA)	40 CFR 6, Appendix A	Statement of Procedures on Floodplain Management and Wetlands Protection. Establishes policy and guidance to avoid the occupancy and modification of floodplains, or the destruction or modification of wetlands	
Federal Acts and Regulations	Endangered Species Act	40 CFR 400 50 CFR 17, 81, 223, 224, 226, 402	Standards for the protection of threatened and endangered species (wildlife, marine and anadromous species and plants) and establish cooperation with the Federal and State Governments	

LOCATION-SPECIFIC ARARS OR TBC CRITERIA				
REGULATOR	**CRITERION**	**CITATION**	**DESCRIPTION**	**COMMENTS**
Federal Acts and Regulations	Fish and Wildlife Conservation Act	16 USC 2901 et seq.	Established EPA policy and guidance for promoting the conservation of non-game fish and wildlife and their habitats	Potentially applicable for construction activities performed which may impact non- game fish and wildlife and their habitats
Federal Acts and Regulations	Protection of Migratory Game & Insectivorous Birds	16 USC 703	Preservation of migratory birds and habitat	Potentially applicable for any area with nesting migratory birds
Federal Acts and Regulations	National Historic Preservation Act	16 USC 469 et seq.; 40 CFR 6301	Establishes procedures to provide for preservation of historical and archaeological data that might be destroyed through alteration of terrain as a result of a Federally licensed activity or program	

ACTION-SPECIFIC ARARS OR TBC CRITERIA				
REGULATOR	**CRITERION**	**CITATION**	**DESCRIPTION**	**COMMENTS**
NJ Statutes and Rules	Well Construction and Maintenance	NJAC 7:9D	Establishes requirements for construction and decommission (sealing) of wells, and well driller / pump installer licensing	Applicable if wells are constructed or decommissioned
NJ Statutes and Rules	New Jersey Soil Erosion and Sediment Control Act	NJSA 4:24-39 et seq	To establish soil erosion and sediment control standards for Department of Transportation certification of its projects to the Soil Conservation Districts	
NJ Statutes and Rules	New Jersey Air Pollution Control Act	NJAC 7:27-8, 16	Establishes standards for discharge of pollutants to air	
NJ Statutes and Rules	Pollutant Discharge Elimination System	NJAC 7:14A	Establishes standards for discharge of pollutants to surface and ground waters	Potentially applicable if wastewater is discharged to surface or ground water
NJ Statutes and Rules	Technical Requirements for Site Remediation (TRSR) and Administrative Requirements for the Remediation of Contaminated Sites (ARRCS)	NJAC 7:26E- 8	Identifies requirements for institutional controls for contaminated soils left in place, and for contaminated groundwater; identifies administrative requirements for site remediation that may be applicable	Potentially applicable if chemical residuals in soils left in place are above the industrial SRS; potentially applicable to CEA and MNA implementation
NJ Statutes and Rules	Noise Control	NJAC 7:29	Establishes allowable noise levels	Potentially applicable in residential areas
Federal Acts and Regulations	SDWA	40 CFR 144- 147	Underground injection control regulations that provide for the protection of underground sources of drinking water	
Federal Acts and Regulations	Clean Water Act (CWA)	33 USC 1251 et seq.	Procedures to preserve surface water quality by reducing direct pollutant discharges into waterways, finance municipal wastewater treatment facilities and manage polluted runoff	

ACTION-SPECIFIC ARARS OR TBC CRITERIA				
REGULATOR	**CRITERION**	**CITATION**	**DESCRIPTION**	**COMMENTS**
Federal Acts and Regulations	National Pollution Discharge Elimination System (NPDES)	40 CFR 122- 125	Establishes requirements for discharges associated with industrial activity, to water bodies or wetlands	Water quality standards and best management practices apply, and a discharge permit is required
Federal Acts and Regulations	Ambient Water Quality Criteria (AWQC)	40CFR131, 401	Provides criteria developed for the protection of freshwater and marine aquatic life and for the protection of human health from the ingestion of water and/or organisms	
	General Pretreatment Regulations for Existing and New Sources of Pollution	40 CFR 403	Prohibits discharge of pollutants to a Publically Operated Treatment Works (POTW) which cause or may cause pass-through or interference with operation of the POTW	Potentially applicable if water is discharged to a POTW
Federal Acts and Regulations	Fish and Wildlife Coordination Act	16 USC 661-666	Requires consultation when a federal department or agency proposes or authorizes any modification of any stream or other water body and adequate provision for protection of fish and wildlife resources	
Federal Acts and Regulations	Toxic Pollutant Effluent Standards	40 CFR 129	Establishes effluent standards or prohibitions for certain toxic pollutants such as pesticides and PCBs	
Federal Acts and Regulations	RCRA	42 USC 6901 et seq.; 40 CFR 260-270	Establishes responsibilities and standards for the management of hazardous and non-hazardous waste	Applicable to solid waste streams from drill cuttings during well installation
Federal Acts and Regulations	Hazardous Materials Transportation Act (HMTA)	49 USC 1801- 1813; 49 CFR 107, 171-177	Regulates transportation of hazardous materials in commerce	Potentially applicable for transportation of drill cuttings
Federal Acts and Regulations	Clean Air Act (CAA)	42 USC 7401	Establishes requirements to preserve air quality and to reduce air pollution	
Federal Acts and Regulations	National Ambient Air Quality Standards (NAAQs)	40 CFR 50	Establishes primary and secondary standards for six pollutants to protect the public health and welfare	

ACTION-SPECIFIC ARARS OR TBC CRITERIA				
REGULATOR	**CRITERION**	**CITATION**	**DESCRIPTION**	**COMMENTS**
Federal Acts and Regulations	National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR 63	Establishes regulations for specific air pollutants (such as benzene and PCE)	

Notes:

ARAR	Applicable *or* relevant and appropriate requirement
ARRCS	Administrative Requirements for the Remediation of Contaminated Sites
AWQC	Ambient Water Quality Criteria
CFR	Code of Federal Regulations
CAA	Clean Air Act
CEA	Classification Exception Area
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
HMTA	Hazardous Materials Transportation Act
mg/kg	Milligrams per kilogram
MNA	Monitored Natural Attenuation
NAAQ	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NJ	New Jersey
NJAC	New Jersey Administrative Code, Chapters as specified
NJSA	New Jersey Statutes
NPDES	National Pollutant Discharge Elimination System
OSWER	Office of Solid Waste and Emergency Response
PCB	polychlorinated biphenyl
PCE	perchloroethylene
POTW	Publicly Operated Treatment Works
RCRA	Resource Conservation and Recovery Act
SDWA	Safe Drinking Water Act
SSL	Soil Screening Levels
TBC	To Be Considereds
TRSR	Technical Requirements for Site Remediation
USC	United States Code

Also note: While not an ARAR, all relevant sections of the Occupational Safety and Health Standards and Safety and Health Regulations for Construction (29 CFR 1910 and 1926) will be complied with.

APPENDIX III

Administrative Record Index

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

FINAL

07/21/2016

REGION ID: 02

Site Name: VINELAND CHEMICAL CO., INC.
CERCLIS ID: NJD002385664
OUID: 03
SSID: 02B8
Action: Blackwater Branch

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
395954	7/21/2016	ADMINISTRATIVE RECORD INDEX FOR OU3 FOR THE VINELAND CHEMICAL COMPANY INCORPORATED SITE	1	ARI / Administrative Record Index		R02: (US ENVIRONMENTAL PROTECTION AGENCY)
99365	9/28/1989	RECORD OF DECISION FOR THE VINELAND CHEMICAL COMPANY INCORPORATED SITE	225	RPT / Report		R02: (US ENVIRONMENTAL PROTECTION AGENCY)
395912	7/19/2016	FOCUSED FEASIBILITY STUDY FOR OU3 FOR THE VINELAND CHEMICAL COMPANY INCORPORATED SITE	110	RPT / Report		
396032	7/20/2016	FOCUSED FEASIBILITY STUDY ADDENDUM FOR OU3 FOR THE VINELAND CHEMICAL COMPANY INCORPORATED SITE	4	MEMO / Memorandum		R02: Young, Hunter (US ENVIRONMENTAL PROTECTION AGENCY)
395948	7/21/2016	PROPOSED PLAN FOR OU3 FOR THE VINELAND CHEMICAL COMPANY INCORPORATED SITE	14	WP / Work Plan		R02: (US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX IV

State Letter

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION PROGRAM
Mail Code 401-06
P. O. Box 420
Trenton, New Jersey 08625-0420
Tel. #: 609-292-1250
Fax. #: 609-777-1914

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

September 22, 2016

Mr. Walter Mugdan, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency
Region II
290 Broadway
New York, NY 10007-1866

Re: Vineland Chemical Company Superfund Site
Record of Decision Amendment Operable Unit 3
EPA ID# NJD002385664
DEP PI# 001140

Dear Mr. Mugdan:

The New Jersey Department of Environmental Protection (DEP) completed its review of the "Record of Decision Amendment, Vineland Chemical Company Superfund Site, Cumberland County, New Jersey, Operable Unit 3: Exposed Sediment of the Blackwater Branch" prepared by the U.S. Environmental Protection Agency (EPA) Region II in August 2016 and concurs with the selected remedy to address arsenic contamination to protect local waterways.

The new remedial actions included in this Record of Decision Amendment cover a discrete portion of OU3 of the site involving exposed sediment/soil of the Blackwater Branch floodplain near the former Vineland Chemical Company property. The selected remedy, with an estimated present-worth cost of $14,897,663, is considered an interim remedial action that will be revisited at a future date once its long-term effectiveness as a part of the remedy for all operable units of the site is evaluated.

During discussions between EPA and DEP about this ROD amendment, it was noted that further evaluation of the site's current groundwater treatment system in Operations and Maintenance with state contractors should be included for review during these new remedial actions on site. The groundwater remedy began operation in spring 2000 and transitioned to state control in October 2014.

The major components of this ROD Amendment to address certain areas of exposed sediment/soil of the Blackwater Branch floodplain that have become re-contaminated with arsenic above the cleanup goals identified in the 1989 ROD due to arsenic in groundwater impacting these sediment/soil areas include the following:

- Installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above remediation goals.
- Hot-spot excavations to remove exposed sediment/soil in the Blackwater Branch floodplain above remediation goals.
- Performance monitoring and assessment of the need for additional in-situ treatment and/or excavation.

The in-situ technology used may vary across the site and will depend on the geochemistry and subsurface conditions in each particular location. Examples of such technologies include air sparging in iron rich groundwater environments and iron chloride injection in addition to air sparging or peroxide injection in iron poor groundwater environments. In-situ technologies may also include pH adjustments and/or the installation reactive barriers. In addition, the need for excavation of the exposed sediment/soil before and/or after in-situ treatment for each area of the site will be determined during the remedial design and refined during the remedial action.

DEP appreciates the opportunity to participate in the decision making process to select an appropriate remedy for this site. Further, DEP is looking forward to future cooperation with EPA in remedial actions to ensure a full cleanup at all areas impacted by this site.

If you have any questions, please call me at 609-292-1251.

Sincerely,

Kenneth J. Kloo
Director, Division of Remediation Management
Site Remediation & Waste Management Program

C: Mark J. Pedersen, Assistant Commissioner,
Site Remediation & Waste Management Program
Edward W. Putnam, Assistant Director, Publicly Funded Response Element, DEP
Carole Petersen, Chief, New Jersey Remediation Branch, EPA Region II

APPENDIX V

Responsiveness Summary

RESPONSIVENESS SUMMARY

FOR THE

RECORD OF DECISION AMENDMENT

VINELAND CHEMICAL COMPANY SITE

CUMBERLAND COUNTY, NEW JERSEY

INTRODUCTION

This Responsiveness Summary provides a summary of comments and concerns provided during the public comment period related to the Proposed Plan (Attachment A) for Operable Unit 3 (OU3) of the Vineland Chemical Company Superfund site (the site) and provides the U.S. Environmental Protection Agency's (EPA's) responses to those comments. All comments summarized in this document have been considered in EPA's final decision in the selection of a remedy to address the contamination at the site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

All documentation which the EPA used to develop the Proposed Plan and select the remedy in this Record of Decision ("ROD") Amendment, including the EPA's Focused Feasibility Study dated July 2016, are in the Administrative Record for the site which was made available to the public beginning July 22, 2016 in the information repositories maintained in the EPA Docket Room at the EPA Region 2 offices at 290 Broadway, New York, New York, at the Vineland Public Library, 1058 East Landis Avenue, Vineland, New Jersey and on EPA's website for the site, www.epa.gov/superfund/vineland-chemical.

On July 22, 2016, EPA published a notice in the *Press of Atlantic City* newspaper informing the public of the commencement of the public comment period for the Proposed Plan, the upcoming public meeting on August 8, 2016, the preferred remedy for OU3, contact information for EPA personnel, and the availability of site-related documents in the Administrative Record. Copies of the notice can be found in Attachment B of this appendix. The Proposed Plan is available at each of the repositories listed above, including online. The public comment period ran from July 22, 2016 to August 22, 2016. EPA held a public meeting on August 2, 2016 at 6:30 P.M. in the City Council Chambers of Vineland City Hall at 640 E Wood Street, Vineland, New Jersey, to present the findings of the Proposed Plan, and to answer questions from the public about the Proposed Plan, the remedial alternatives evaluated, and EPA's preferred alternative.

SUMMARY OF COMMENTS AND RESPONSES

A summary of the comments provided at the public meeting and all written comments submitted during the public comment period, as well as the EPA's responses to them, are provided below. The transcript from the public meeting and the comments submitted during the public comment period can be found in Attachments C and D, respectively, of this appendix.

Comment 1: The City of Vineland Health Department endorses EPA's preferred alternative.
EPA Response to Comment 1: EPA acknowledges the comments in support of its preferred alternative.

ATTACHED TO THIS RESPONSIVENESS SUMMARY ARE THE FOLLOWING:

Attachment A - Proposed Plan
Attachment B - Public Notice - *Press of Atlantic City*
Attachment C - August 8, 2016 Public Meeting Transcript
Attachment D - Comments Submitted During Public Comment Period

Attachment A

Proposed Plan

Vineland Chemical Company Superfund Site
Blackwater Branch Exposed Sediment/Soil

Vineland, New Jersey

Superfund Proposed Plan

July 2016

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives that the United States Environmental Protection Agency (EPA) considered for amending the approach to remediate contaminated exposed sediment/soil of the Blackwater Branch floodplain that are associated with the Vineland Chemical Company Superfund site located in Vineland, New Jersey. This Plan also identifies EPA's Preferred Alternative along with the reasons for this preference.

This Proposed Plan includes summaries of cleanup alternatives evaluated for use at the affected floodplain areas. This Proposed Plan was developed by EPA, the lead agency for the site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. As described herein, there are larger issues related to groundwater contamination at the site that are still being evaluated. As such, this Proposed Plan describes interim alternatives for the Blackwater Branch floodplain that may be revisited at a future date. EPA, in consultation with NJDEP, will select an interim remedial action that amends the current remedy for exposed sediment/soil of the Blackwater Branch floodplain after reviewing and considering all information submitted during the 30-day public comment period. EPA, in consultation with NJDEP, may modify the Preferred Alternative or select another response action presented in this Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

EPA is issuing this Proposed Plan in accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) 42 U.S.C. 9617(a), and Section 300.435(c) (2) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Focused Feasibility Study (FFS) and other related documents contained in the publicly available Administrative Record for the site. EPA encourages the public to review these documents to gain a more comprehensive understanding of the site and Superfund activities that have been conducted. The current remedy for this portion of the site, selected in a 1989 Record of Decision (ROD), consists of dredging, excavation, and disposal of contaminated sediment and soil in the Blackwater Branch floodplain. The Preferred Alternative identified in this Proposed

MARK YOUR CALENDARS

Public Comment Period
July 22 –August 22, 2016

EPA will accept written comments on the Proposed Plan during the public comment period. Written comments should be addressed to:

Hunter Young
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 18th Floor
New York, NY 10007
Email: young.hunter@epa.gov

Written comments must be postmarked no later than August 22, 2016.

Public Meeting
August 8, 2016 at 6:30 P.M.
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at:

Vineland City Hall – City Council Chambers
640 E Wood St, Vineland, NJ 08360

In addition, select documents from the administrative record are available on-line at:

www.epa.gov/superfund/vineland-chemical

Plan would amend that ROD to require implementation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil (which is generally defined as sediment located above the average high water line), excavation of localized areas of sediment/soil in the Blackwater Branch floodplain with significantly elevated concentrations of contaminants, and performance monitoring to assure the remedy is effective and to assess the need for additional in-situ treatment and/or excavation.

COMMUNITY ROLE IN SELECTION PROCESS

This Proposed Plan is being issued to inform the public of EPA's proposed alternative and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the Preferred Alternative. Changes to the Preferred Alternative, or a change to another alternative, may be made if public comments or additional data indicate that such a change would result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comments on all of the alternatives considered in the Proposed Plan, because EPA may select a remedy other than the Preferred Alternative. This Proposed Plan has been made available to the public for a public comment period that concludes on August 20, 2016.

A public meeting will be held during the public comment period to present the information regarding the investigations of the Blackwater Branch floodplain, including the conclusions of studies performed to assess treatment options and the FFS, to elaborate further on the reasons for proposing the Preferred Alternative, and to receive public comments. The public meeting will include a presentation by EPA of the Preferred Alternative and other cleanup options.

Information on the public meeting and submitting written comments can be found in the "Mark Your Calendar" text box on Page 1.

Comments received at the public meeting, as well as written comments received during the comment period, will be documented in the Responsiveness Summary section of the ROD Amendment. The ROD Amendment is the document that presents which alternative has been selected and the basis for the selection of the remedy.

SCOPE AND ROLE OF RESPONSE ACTION

The site is divided into four operable units (Figure 2). The 1989 ROD selected remedies to address each of the operable units, and several parts of the cleanup work specified in the ROD have already been completed.

Operable Unit 1 (OU1) consisted of the control of source material at the former Vineland Chemical Company plant site. To address arsenic-contaminated soil, EPA constructed a soil washing facility that processed 70 tons of excavated soil per hour. The facility processed over 400,000 tons of arsenic-contaminated soil and sediment, and the remaining waste was disposed of at a permitted off-site disposal facility. The soil remedy was completed in 2014.

OU2 relates to management of the migration of contamination through groundwater. To address contaminated groundwater, EPA constructed a system to pump out and treat about two million gallons of contaminated groundwater daily. Operation of the facility began in the spring of 2000 and is ongoing. The pump-and-treat operation is capturing the majority of the flow of arsenic-contaminated groundwater from the plant site. The treated groundwater continues to meet the site's cleanup goal. Operation of the pump-and-treat system was transferred to NJDEP in October 2014.

The primary objective of the response action described herein involves portions of OU3, which relates to addressing contamination associated with the sediment/soil in the river areas, including the Maurice River, the Blackwater Branch of the Maurice River and their associated floodplains. Initial cleanup activities were completed for OU3 in December 2012. However, monitoring since that time has shown that certain areas of exposed sediment/soil of the Blackwater Branch floodplain have become re-contaminated with arsenic above the cleanup goals identified in the 1989 ROD due to arsenic in groundwater reaching the sediment/soil during the ongoing implementation of the OU2 remedy. As such, additional actions may be required to address this portion of OU3; alternatives are evaluated herein. This Proposed Plan does not fully address the Maurice River or the submerged sediment of the Blackwater Branch, which are also portions of OU3 of the site. These portions are still under review.

OU4 of the site relates to Union Lake, an 870-acre impoundment on the Maurice River. The upstream remedial activities will be evaluated prior to proceeding with active cleanup of the lake. Arsenic contamination in sediment has been found in the lake. Surface water samples had elevated arsenic concentrations only when agitated (mixed with contaminated sediment). Beach monitoring in Union Lake began in the early 2000s and will continue until it is concluded that there are no further impacts to the lake. To date, no unacceptable risks to beach users have been identified.

Future amendments to the 1989 ROD may be required, including for the remainder of OU3.

SITE BACKGROUND

Site Description

The Vineland Chemical Company Superfund site is located in the northwestern portion of Vineland, in Cumberland County, south central New Jersey, in an area of mixed industrial, low-density residential and agricultural properties (Figure 1). The site is bordered immediately to the north by other industrial properties and the Blackwater Branch, a perennial stream that flows westward to the Maurice River.

The Blackwater Branch of the Maurice River flows northeast to southwest, in proximity to, and partially through, the site itself. A floodplain lies immediately adjacent to the Blackwater Branch along the entire length of the tributary extending to the Maurice River. This area is the subject of this Proposed Plan.

Site History

The Vineland Chemical Company operated from 1949 to 1994 and produced arsenical herbicides and fungicides. There were seventeen buildings on the plant site, some of which were used by the Vineland Chemical Company for various manufacturing purposes.

As early as 1966, the New Jersey Department of Health observed untreated wastewater being discharged into unlined lagoons at the site. This wastewater was contaminated with arsenic at concentrations up to 67,000 parts per billion (ppb). Waste salts containing 1-2 percent arsenic were stored outside in uncovered piles. Precipitation dissolved some of these salts and carried them into the groundwater and eventually into nearby surface water bodies. Contaminated sediment was mapped 1.5 miles downstream in Blackwater Branch to its confluence with the Maurice River and then 7.5 miles downstream to Union Lake.

The site was added to the EPA's National Priorities List (NPL) in September 1984. A Remedial Investigation and Feasibility Study (RI/FS) was completed in 1989 to identify the types, quantities, and locations of contaminants, and to develop ways to correct the problems posed by the contaminants.

Based on the RI/FS findings, EPA implemented a number of response actions that included securing the site with a perimeter fence and removing thousands of gallons of arsenic solutions and demolition of eight buildings.

A ROD for the site was signed in 1989 and determined that actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response actions selected in the ROD, may present an existing or potential threat to public health, welfare or the environment. The ROD divided the site into four operable units (OUs) as described in the "Scope and Role of Action" section above.

Enforcement History

Potentially responsible parties (PRPs) identified for the site include the Vineland Chemical Company and its owners.

In 1994, the PRPs entered into a judicial consent decree with EPA. The consent decree assured that the PRPs funded the remedial work to the maximum extent possible.

SITE CHARACTERISTICS

The site is located in the Atlantic Coastal Plain physiographic province, which consists of a seaward-dipping wedge of unconsolidated sediment (sand, silt, clay, and gravel) that range in age from Cretaceous to Quaternary periods. Locally, the site is situated on a relatively level plain that slopes slightly from the southeast toward the northwest with topographic elevations that range from 65 to 75 feet above mean sea level.

Groundwater levels vary seasonally at the site with an average of approximately 10 feet below ground surface (bgs), and a typical minimum and maximum of between 4 and 19 feet bgs. When the groundwater treatment plant is not in operation, groundwater south of the Blackwater Branch moves in an east to west direction with groundwater discharging at several locations along Blackwater Branch. Under pumping conditions, the direction of flow is somewhat altered to a more southeast to northwest flow direction south of Blackwater Branch, and a northeast to southwest flow direction north of Blackwater Branch. Groundwater that is not captured by the recovery system discharges to Blackwater Branch.

RESULTS OF THE REMEDIAL STUDIES

Implementation of 1989 ROD Remedy for OU3

The excavation and treatment of arsenic impacted sediment from the Blackwater Branch and its floodplain were carried out in four phases from 2006 through 2012. Phase I encompassed the area east of North Mill Road and adjacent to the chemical plant site. Phase II encompassed the area west of North Mill Road and east of Route 55. Phase III encompassed the area west of Route 55 and east of the Maurice River Parkway. Phase IV encompassed the stream and floodplain west of the Maurice River Parkway to the Maurice River.

In each phase, the Blackwater Branch was diverted to a clean location before excavation of the contaminated material was performed. Once material with arsenic concentrations exceeding 20 milligrams/kilogram (mg/kg), the value identified in the 1989 ROD, was removed, the excavated area was backfilled with clean material and stream flow was restored to the re-constructed stream channel.

Soon after arsenic excavation in the floodplain of Phases 1 and 2 was completed in 2009, iron staining along the banks and within the Blackwater Branch was observed in certain locations. Sediment and seep water samples taken at a few of these iron-stained locations were analyzed in 2010 to determine if these iron-stained sediment also contained arsenic. Phase 1 samples were taken after excavation, backfilling and flow had been restored to the channel. Phase 2 samples were collected after excavation and backfilling in the floodplain had occurred, but before flow was restored to the original creek channel.

The sediment samples that were co-located with the seep samples contained arsenic just above the floodplain sediment goal of the 1989 ROD (20 mg/kg). These results provided evidence that arsenic is seeping into the Blackwater Branch floodplain at some of the locations sampled even with the pump and treat system in operation, contaminating exposed sediment. The OU3 remedy was selected based on the assumption that groundwater discharging into the Blackwater Branch floodplain would not impact the exposed sediment. Sampling of surface sediment was performed between 2011 and 2012 along Phases 2, 3 and 4, soon after stream restoration and prior to re-diverting the surface water back to the stream. Samples were biased toward the iron-stained sediment. Results indicate that arsenic in surface sediment samples accumulated soon after restoration and concentrations exceed the 20 mg/kg ROD goal for exposed sediment. Due to extensive arsenic exceedances along the Phase 4 segment of the Blackwater Branch, surface water was not re-diverted back to this section of the Blackwater Branch. The Blackwater Branch was eventually re-diverted back to a stream alignment that was similar to the original but followed an alternate path around the areas where the arsenic exceedances were encountered.

Additional sediment sampling was conducted in Phases 1 and 2 between 2013 and 2015. Samples were biased to locations that were iron-stained and were collected from floodplain areas as well as locations near the banks of the Blackwater Branch where sediment is likely to be exposed during periods of low water level conditions. During this time period, operation of the pump and treat system varied between full pumping, no pumping and partial pumping. Concentrations of arsenic in sediment samples exceeded 20 mg/kg while the pump and treat system was fully operational as well as while the pump and treat system was shut down.

In summary, sediment samples collected between 2010 and 2015 demonstrated that groundwater that is discharging to the Blackwater Branch in certain areas is recontaminating the sediments due to localized geochemical conditions that result in the dissolved arsenic precipitating out as the groundwater discharges into the branch sediment. Over time, larger areas of sediment may become recontaminated. It should be noted that despite the elevated arsenic concentrations in the floodplain, surface water arsenic concentrations have not been found to be elevated.

Bench Scale Studies

Once it was determined that implementation of the OU3 remedy would not prevent recontamination of the floodplain sediment/soil, preliminary bench scale (laboratory) testing was conducted to evaluate the viability of in-situ (in-ground) treatment as a method of controlling recontamination. In-situ treatments evaluated at the bench scale focused on creating conditions for which the accumulation of arsenic in sediment would be unfavorable either by reducing the movement of arsenic to the sediment/soil of the floodplain or by reducing the availability of areas onto which arsenic can accumulate through bonding with the sediment.

Results of the bench scale studies indicated that several methods of in-situ treatment can reduce arsenic accumulation in sediment/soil so that concentrations in the Blackwater Branch floodplain would remain below cleanup goals. These methods include in-situ treatment with oxygen (such as by air sparging or the use of peroxide), in-situ treatment with iron, and/or in-situ pH adjustment.

In 2015, pilot (in-field) testing of in-situ treatment options was initiated, and the preliminary results of this testing are favorable. Because the results show that the in-situ treatment is working, the pilot study will continue and will remain operational until an amended remedy is implemented.

PRINCIPAL THREATS

Although arsenic in groundwater is acting as a source of recontamination of the exposed sediment/soil of the Blackwater Branch floodplain, groundwater is generally not considered to be a source material under the conceptual definition of a principal threat (see related box “What is a “Principal Threat”?). The arsenic in groundwater can also be reliably immobilized through in-situ treatment. As such, the groundwater is not considered a principal threat waste for this OU of the site.

SUMMARY OF SITE RISKS

As part of the FFS, human health and ecological risk evaluations were conducted for the exposed sediment/soil of the Blackwater Branch floodplain to estimate risks associated with current and future site conditions. Three separate areas with contamination were identified with unique geochemical conditions known as Areas A, B, and C (Figure 3).

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in groundwater may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

Human Health Risk Assessment

As part of the FFS for OU3, a human health risk assessment (HHRA) process was used for assessing site-related cancer risks and non-cancer health hazards associated with exposure to arsenic in the sediment/soil. The four-step process is comprised of: Hazard Identification, Exposure Assessment, Toxicity Assessment, and Risk Characterization (see adjoining box “What is Risk and How is it Calculated” for more details on the risk assessment process).

The HHRA reviewed post-excavation exposed sediment/soil data collected between 2012 and 2015 in the Blackwater Branch floodplain against current risk-based screening levels (RSLs). A screening evaluation was conducted for the future recreational user, or recreator, in the Blackwater Branch floodplain to assess the protectiveness of the remedy that was selected in the original 1989 Record of Decision for OU3.

Calculation of risk-based RSLs for sediment/soil (which looks at exposure through ingestion, dermal contact with and inhalation of contaminated sediment/soil) were based on standardized equations that combine exposure information and assumptions with available toxicity data. Recreator exposure parameters were used to best approximate site exposure during future recreational use of the Blackwater Branch. Any current site user (e.g., treatment plant worker or trespasser) would have less frequent exposures, and thereby lower risks, than these future receptors. A reasonable maximum exposure scenario of 4 hours per day and 40 days per year was considered, in line with the 1989 Baseline Risk Assessment's evaluation of recreational use.

The maximum detected arsenic concentrations in all three areas of the Blackwater Branch floodplain are greater than the human health-based RSLs, which indicates the potential for unacceptable risk and adverse health effects from recreational exposure to exposed Blackwater Branch sediment/soil. Additionally, the maximum concentrations of arsenic in all three areas of the Blackwater Branch floodplain exceed the site 1989 cleanup level of 20 mg/kg for arsenic in exposed sediment by an order of magnitude or more.

A semi-quantitative screening evaluation was conducted for Area A of the Blackwater Branch floodplain. The results indicate that the current remedy is likely not protective of human health for a future recreator. The estimated cancer risk for a child and adult recreator utilizing the Blackwater Branch in this area would equal 2 x10^{-4}, exceeding the 10^{-4} lifetime excess cancer risk end of the risk range. The non-cancer hazard estimate for a child recreator is 5, exceeding EPA's non-cancer hazard index of 1.

Ecological Risk Assessment

A different approach was used in evaluating ecological risk associated with contamination in the exposed sediment/soil of the Blackwater Branch floodplain in comparison to the evaluation of human health risks. As is stated above, maximum concentrations of arsenic in all three areas of the Blackwater Branch floodplain exceed the site 1989 cleanup level of 20 mg/kg for arsenic in exposed sediment/soil by an order of magnitude or more. As such, an evaluation was conducted to determine whether cleanup of the floodplain to concentrations below the 1989 ROD goal would be protective of the environment.

The floodplain soil is considered to be representative of a terrestrial environment, thus concentrations of arsenic were compared to EPA's Ecological Soil Screening Level (Eco-SSLs), which are concentrations of contaminants in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil. As such, these values are presumed to provide adequate protection of

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.,* changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk.

For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site.

terrestrial avian and mammalian receptors. The EPA Eco SSLs for arsenic are 18 mg/kg for plants, 43 mg/kg for avian receptors and 46 mg/kg for mammalian receptors.

Comparison of these screening levels to the 1989 ROD goal of 20 mg/kg for arsenic shows that this value is protective for avian and mammalian receptors. The only ecological value in exceedance of 20 mg/kg is the value that was derived to be protective to plants (18 mg/kg). However, arsenic concentrations at or below background values (20 mg/kg in 1989, 19 mg/kg currently) are not considered COPCs. Conversely, since concentrations above 46 mg/kg are present, this review shows that there is a potential risk to ecological receptors.

Risk Assessment Summary

It is EPA's judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in this Proposed Plan, is necessary to limit potential human health and ecological risks from actual or threatened releases of hazardous substances into the environment.

FOCUSED FEASIBILITY STUDY

The FFS was prepared to evaluate alternative remedial actions for OU3. During the FFS phase, remedial action objectives (RAOs) are developed, preliminary remediation goals (PRGs) are identified, technologies are screened based on overall implementability, effectiveness and cost, and remedial alternatives are assembled and analyzed in detail with respect to the nine criteria for remedy selection under the NCP at 40 C.F.R. Part 300.430.

Remedial Action Objectives

RAOs describe what the proposed remedy is expected to accomplish. These objectives are based on available information and standards such as applicable or relevant and appropriate requirements (ARARs), to-be-considered standards and guidance, and site-specific risk-based levels.

The 1989 ROD identified the following RAO for the sediment in OU3:

- Minimize public exposure, either through containment, removal, or institutional controls, for those areas with unacceptably high sediment arsenic concentrations.

This overall RAO for OU3 remains in effect. The specific RAOs for the remedial alternatives discussed in this Proposed Plan are:

- Reduce concentrations of arsenic in the exposed sediment/soil in the Blackwater Branch floodplain to below acceptable levels of risk.
- Prevent recontamination of exposed sediment/soil of the Blackwater Branch floodplain from site-related groundwater contamination.

Due to the existence of larger groundwater contamination issues at this site, it is EPA's expectation that the remedy described in this Proposed Plan will be revisited at a future date. Therefore, this action is considered an interim remedial action.

Preliminary Remediation Goal

To achieve RAOs, EPA has selected a soil cleanup goal for the exposed sediment/soil. The soil cleanup goal for the COPC is consistent with New Jersey Residential Direct Contact Soil Remediation Standards (NJRDCSRS). Therefore, the PRG for the COPC in exposed sediment/soil of the Blackwater Branch floodplain is as follows:

- Arsenic: 19 mg/kg

The 1989 ROD identified a Preliminary Remediation Goal of 20 mg/kg for arsenic in exposed sediment. Since then, the state of New Jersey has conducted a much more robust study of statewide levels of arsenic in soil, and from this study a statewide concentration of 19 mg/kg has been established. EPA has evaluated the protectiveness of 19 mg/kg and the PRG for arsenic in the exposed sediment/soil has been modified to meet the current New Jersey Soil Remediation Standard.

The PRG will become the final remediation goal when EPA makes a final decision to select an amended remedy for the exposed sediment/soil of the Blackwater Branch floodplain, after taking into consideration public comments.

Remedial Alternatives

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions be protective of human health and the environment, be cost-effective, and use permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which use, as a principal element, treatment to permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Remedial alternatives for the site are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and a 10-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of the remedy, or procure contracts for design and construction.

- Alternative 1: No Further Action
- Alternative 2: Ongoing Hot Spot Excavation
- Alternative 3: In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring

Alternative 1 - No Action

The NCP requires that a “No Action” alternative be evaluated to establish a baseline for comparison with other remedial alternatives. Under this alternative, no further action would be implemented, and the current status of the site would remain unchanged. A Classification Exception Area for the site already exists to restrict use of groundwater. Signs are posted in accessible areas of Blackwater Branch and the Maurice River advising the public that sediment is contaminated with arsenic and there are risks associated with prolonged exposure of arsenic. With the exception of the existing security fences, engineering controls would not be implemented to prevent site access or exposure to site contaminants.

Total Capital Cost:	$0
Annual O&M:	$0
Total Present Net Worth:	$0
Timeframe:	0 years

Alternative 2 – Ongoing Hot Spot Excavation

This alternative consists of periodic excavation and off-site disposal of the exposed sediment/soil of the Blackwater Branch floodplain as the arsenic concentrations exceed the PRG. Excavated sediment/soil would be transported and disposed of off-site.

The sediment/soil would be sampled to determine if they need to be disposed of as either hazardous waste or non-hazardous waste. Treatment of sediment/soil, if needed, would be conducted at and by the approved disposal facility.

Total Capital Cost:	$1,160,646
Annual O&M:	$4,642,584
Present Worth Cost:	$33,768,213
Construction Time Frame:	Constant

Alternative 3 – In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring

This alternative consists of installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above PRGs, hot-spot excavations to remove exposed sediment/soil in the Blackwater Branch floodplain above PRGs, and performance monitoring to assure the remedy is effective and assess the need for additional in-situ treatment and/or excavation. In-situ technologies are those technologies that are implemented in place, rather than removing the contamination and treating it.

The in-situ technology used may vary across the site and will depend on the geochemistry and subsurface conditions in each particular location. Examples of such technologies include air sparging in iron rich groundwater environments and iron chloride injection

THE NINE SUPERFUND EVALUATION CRITERIA

1. Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

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.

3. Long-term Effectiveness and Permanence 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, the community, and the environment during implementation.

6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and 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.

in addition to air sparging or peroxide injection in iron poor groundwater environments. In-situ technologies may also include pH adjustments and/or the installation of material into the ground which will intercept the groundwater flow and passively capture the contamination, also known as 'reactive barriers'. Final selection of the in-situ treatment technology appropriate for each area of the site will be made after further studies during remedial design.

In addition, the need for excavation of the exposed sediment/soil before and/or after in-situ treatment for each area of the site will be determined during the remedial design and further refined during implementation of the remedial action through performance monitoring.

Total Capital Cost:	$7,281,988
Annual O&M Year:	$745,569
Present Worth Cost:	$14,897,663
Construction Time Frame:	1 year

COMPARATIVE EVALUATION OF ALTERNATIVES

EPA uses nine criteria to evaluate the remedial alternatives individually and against each other to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. Each alternative must meet the first two threshold criteria, which are overall protection of human health and the environment, and compliance with ARARs. Alternatives that meet the threshold criteria are then analyzed against five primary balancing criteria: long-term effectiveness and permanence; reduction to toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. State and community acceptance are modifying criteria that are also considered in remedy selection. A detailed analysis assessing the alternatives against each of the nine evaluation criteria is in the FFS.

Overall Protection of Human Health and the Environment

Alternative 1 does not protect human health and the environment because no action is taken to prevent exposure to sediment/soil that exceeds risk based cleanup levels for arsenic.

Alternative 2 is protective of human health and the environment because sediment/soil is removed as it reaches arsenic concentrations that exceed the risk based cleanup goals.

Alternative 3 is protective of human health and the environment because in-situ treatment systems are installed and operated that prevent recontamination of sediment/soil with arsenic, and sediment/soil currently exceeding risk based arsenic concentrations are removed and disposed of off-site.

Compliance with ARARs

Alternative 1 (No action) would not comply with ARARs in that it would leave exposed sediment/soil in place that exceed NJRDCSRS and pose unacceptable risk to human health and the environment.

Alternatives 2 and 3 provide compliance with chemical-specific ARARs by removing contaminated soil above NJRDCSRS. Alternative 2 would accomplish this by removal of sediment/soil that exceeds ARARs, and Alternative 3 would accomplish this by in-situ treatment that would prevent groundwater from recontaminating the sediment/soil. Location-specific ARARs and Action-specific ARARs would both be met by proper design and implementation of the respective components such as general construction standards and waste handling requirements. The Location-specific ARARs and Action-specific ARARs for the disposal phase would be met with proper selection of the disposal facility.

Long-Term Effectiveness and Permanence

Although the three alternatives are interim remedial actions, they were evaluated for long-term effectiveness and permanence.

Alternative 1 does not provide adequate controls of risks to human health over the long-term because there is no mechanism to prevent future exposure.

Alternative 2 is only effective in the long-term with a high level of constant maintenance. It does not treat the source of contamination, and although steps would be taken to protect the surrounding community, there would be nearly continuous operation of construction equipment and hauling of contaminated soil off-site for an indefinite period of time.

Alternative 3 is effective in the long-term in that it prevents recontamination of the exposed sediment/soil in the Blackwater Branch floodplain.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternatives 1 and 2 do not reduce the toxicity, mobility, or volume of contaminants through treatment and therefore do not meet EPAs preference for treatment.

Alternative 3 does not reduce the overall volume of arsenic but does reduce the mobility of arsenic in the groundwater, which reduces the volume entering the Blackwater Branch floodplain. This effectively reduces the toxicity of the groundwater entering the Blackwater Branch floodplain.

Short-Term Effectiveness

There would be no short-term impact to the local community or the environment for Alternative 1.

The construction and implementation activities involved in Alternative 2 would be frequent and would have almost continuous impact on the local community with truck traffic to haul contaminated sediment/soil for off-site disposal.

Alternative 3 would have some impacts to the nearby community due to truck traffic to haul contaminated sediment/soil off-site and drilling activities to install the in-situ treatment systems. However, these impacts would be relatively short term and ongoing long term treatment activities at the site are expected to have minimal impact to the community.

Implementability

All the alternatives are easily implemented. There are no special techniques, materials, or labor required to implement Alternative 2.

Cost

For Alternative 2, each time sediment/soil needs to be excavated it is estimated it will cost $1,160,000. Assuming this has to be performed every 3 months, that is an annual cost of $4,642,584. The present worth cost over a 10-year period is estimated to be $33,768,213.

The estimated capital cost of Alternative 3 is $7,281,988. The annual O&M cost is estimated to be $745,569 the first year and an annual cost of $557,670 for the following years. This alternative also includes an annual monitoring cost of $213,438 the first year, $135,461 the second year and $95,663 for the following years. The 10-year present worth value of this alternative is $14,897,663.

State Acceptance

The State of New Jersey concurs with EPA's Preferred Alternative as presented in this Proposed Plan.

Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD Amendment. Based on public comment, the Preferred Alternative could be modified from the version presented in this proposed plan. The ROD Amendment formalizes the selected remedy after EPA has considered all comments received during the public comment period.

PREFERRED ALTERNATIVE

The Preferred Alternative for achieving remedial action objectives for the exposed sediment/soil of the Blackwater Branch floodplain impacted by site-related contamination is Alternative 3 (In-Situ Treatment, Hot Spot Excavation, and Performance Monitoring). This alternative consists of installation of in-situ treatment technologies to prevent recontamination of the exposed sediment/soil to concentrations above PRGs, excavation of localized areas of sediment/soil in the Blackwater Branch floodplain with concentrations of contaminants above PRGs, and performance monitoring to assure the remedy is effective and assess the need for additional in-situ treatment and/or excavation. This is considered an interim remedial action that will be revisited at a future date once the long-term effectiveness as a part of the remedy for all operable units of the site is evaluated.

The in-situ technology that will be used depends on the geochemistry and subsurface conditions in each particular location. The actual technology will be selected during the Remedial Design. For the purposes of cost estimation the following were used as representative technologies: air sparging in iron rich groundwater environments; iron chloride injection in addition to air sparging in iron poor groundwater environments; sodium bicarbonate or sodium hydroxide injections for pH adjustments. As noted above, the final selection of the in-situ treatment technology appropriate for each area of the site will be made after further studies during remedial design.

The selection of the Preferred Alternative is accomplished through the evaluation of the nine criteria as specified in the NCP. Alternative 3 satisfies the two threshold criteria and achieves the best combination of the five balancing criteria of the comparative analysis. This alternative is preferred because it will achieve the RAOs in the shortest amount of time. Monitoring will provide the data to ensure that the RAOs and PRGs are achieved.

The EPA and NJDEP expect the Preferred Alternative to satisfy the following statutory requirements of CERCLA Section 121(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element. EPA will assess the modifying criteria of community acceptance in the Record of Decision Amendment following the close of the public comment period.

FOR FURTHER INFORMATION

The Administrative Record file, which contains copies of the Proposed Plan and supporting documentation is available at the following locations:

EPA Region 2 Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866
(212) 637-4308
Hours: Monday-Friday – 9 A.M. to 5 P.M.

Vineland City Library
1058 East Landis Ave.
Vineland, New Jersey 08360
For Library Hours:
http://www.vinelandlibrary.org/

In addition, select documents from the administrative record are available on-line at:

www.epa.gov/superfund/vineland-chemical
In addition, select documents from the administrative record are available on-line at:

http://www.epa.gov/region2/superfund/npl/vineland/

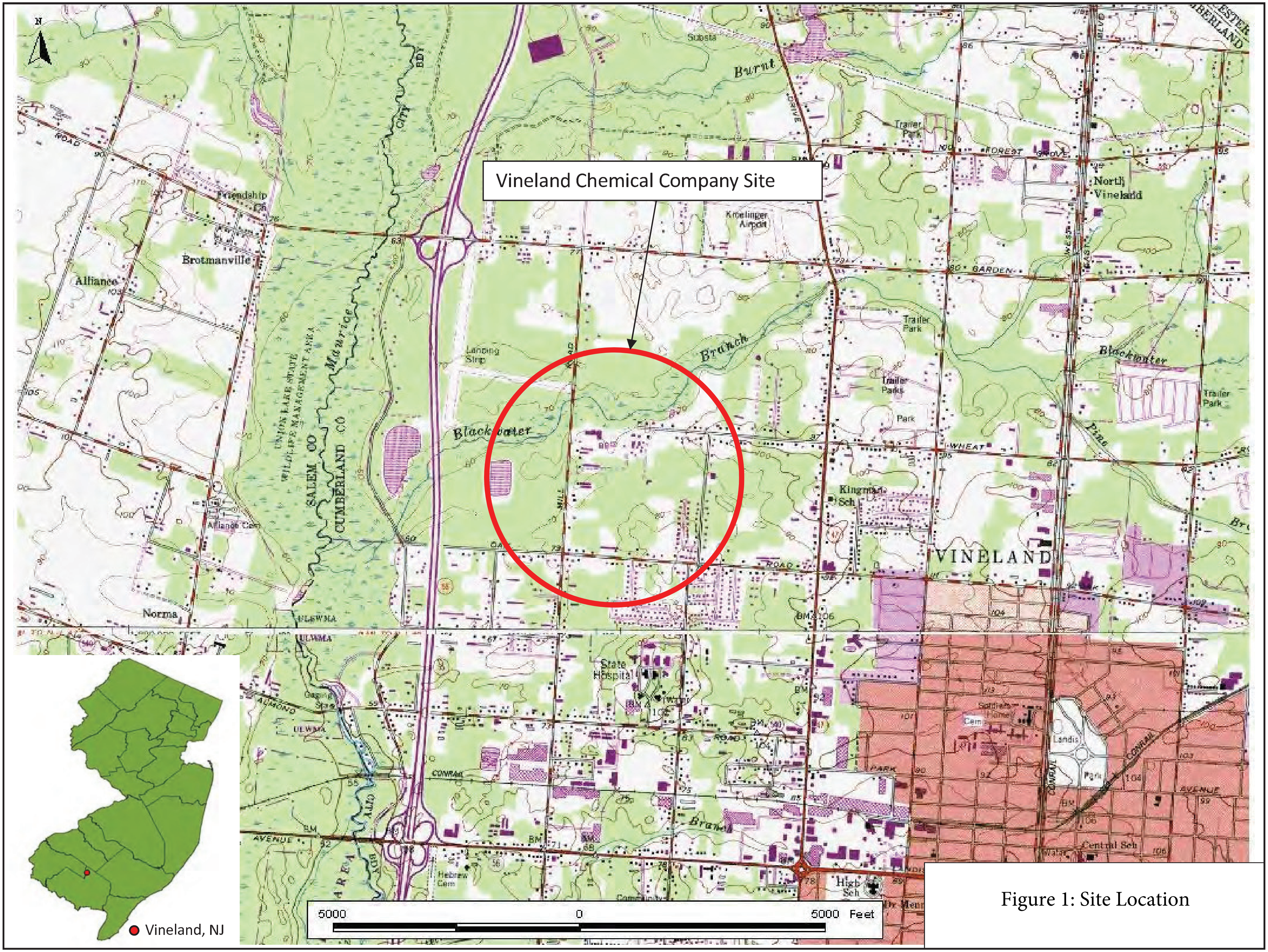


Figure 1: Site Location

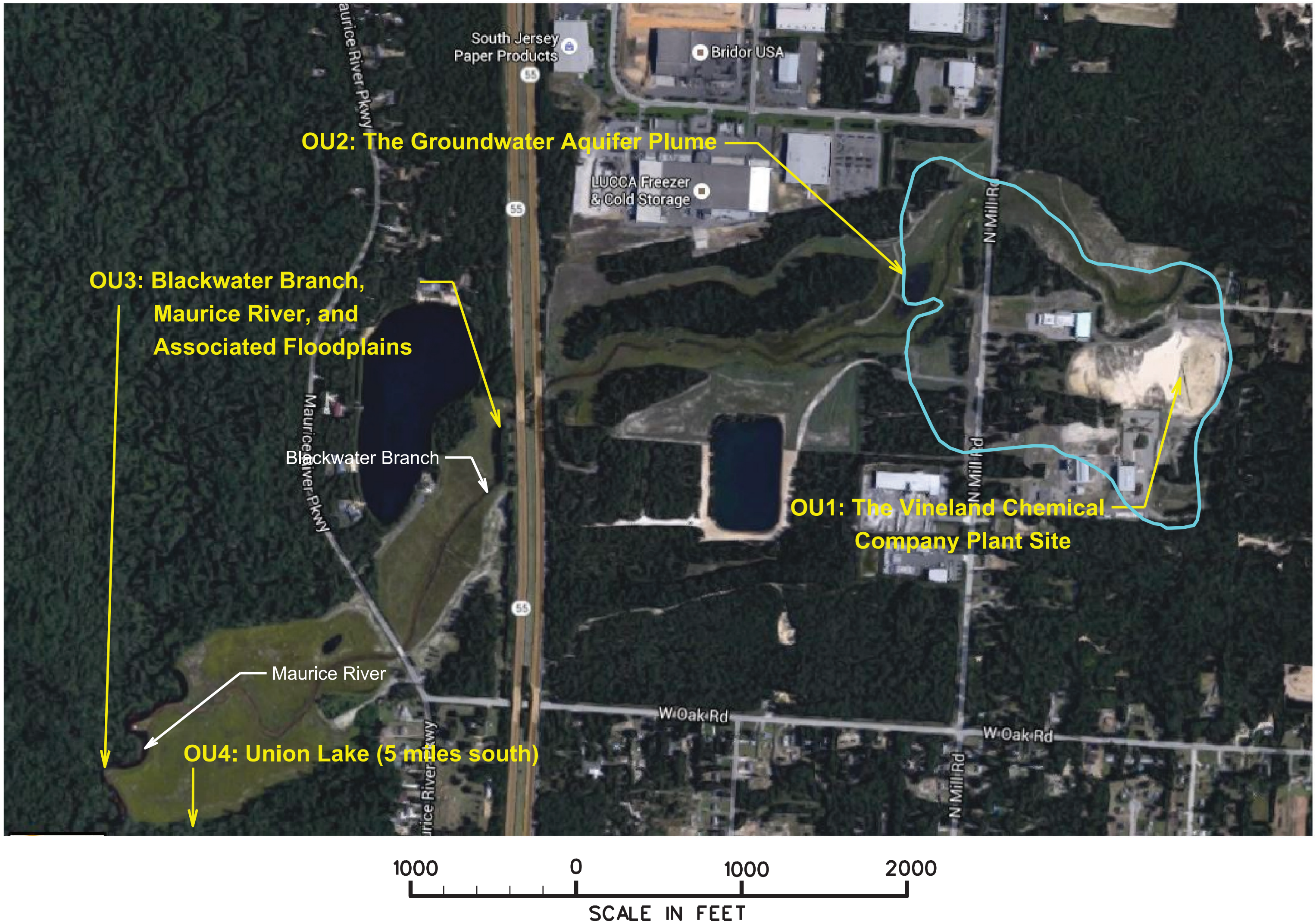


Figure 2: Operable Unit Identification

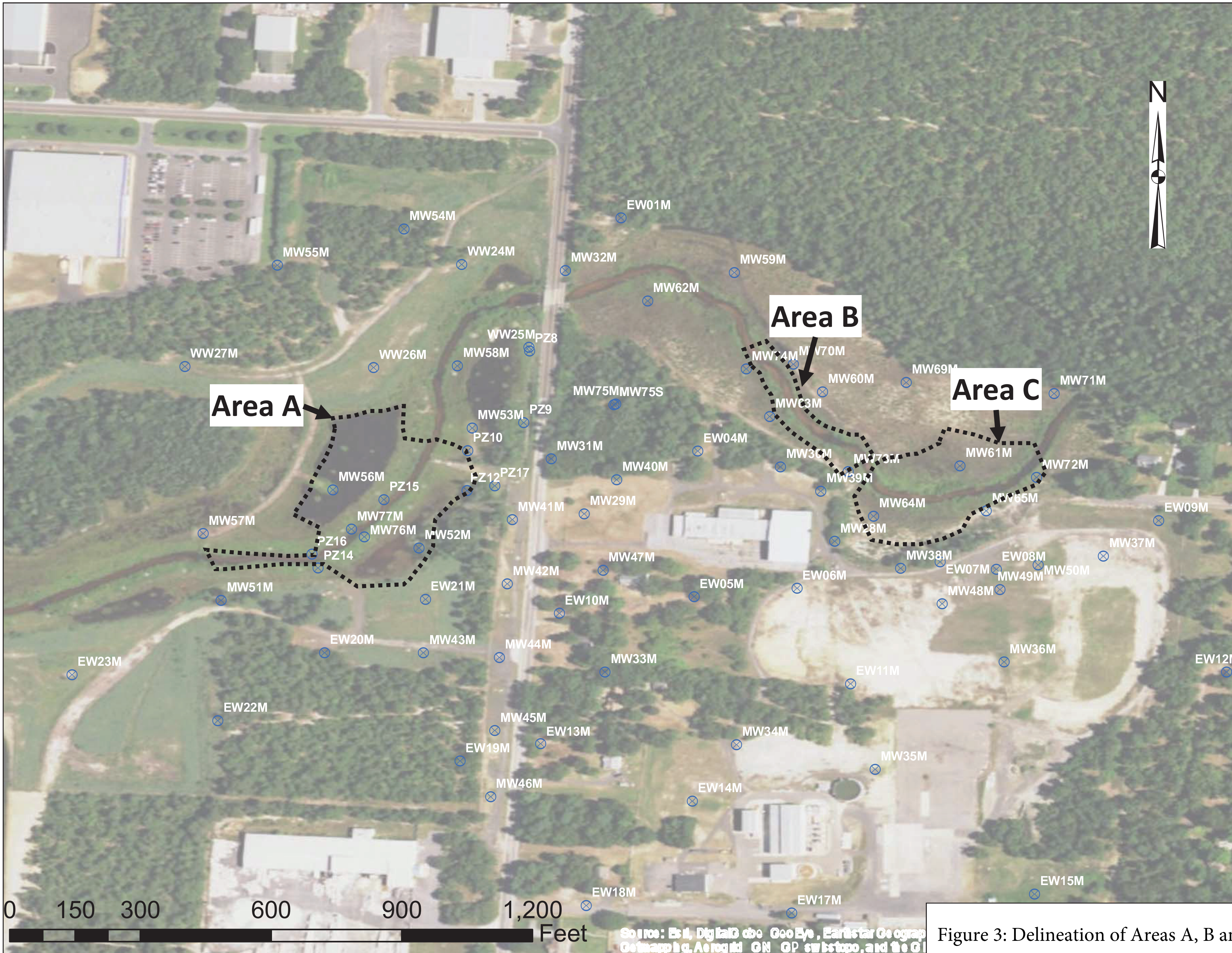


Figure 3: Delineation of Areas A, B and C

Attachment B

Public Notice

CLOSING

Continued from A1

A spokeswoman said the Progresso brand will continue making soup in other plants. But Kelsey Roemhildt of General Mills couldn't say how many of that giant food company's 30 other production plants cook Progresso soups.

"As a category, canned soup has been declining for some time," she said.

Brian String, president of UFCW Local 152, said his union represents about 275 Progresso workers. He said the closing announcement came just two months after union members ratified a four-year contract.

"People here are angry, and I don't blame them," String said Thursday. "During four months of bargaining, the company never hinted that this plant might close. Its negotiators never asked for concessions that our members surely would have granted to keep the plant open."

State Sen. Jeff Van Drew, D-Cape May, Cumberland, Atlantic, called the announcement "heartbreaking" but held out hope it could change.

"We must keep in mind that the plant is not going to close tomorrow. We have until next summer to see if the plant can be retooled or changed, if products can be changed or anything," he said, although he added that officials will look for other companies to fill the plant and restore some jobs.

KRISHNA MATHIAS / PRESS GRAPHIC

But the company's highlighting its Vineland roots in those ads has a bad taste to him now.

"The point was that this was a homemade type of soup, made right here in good old Vineland," he said. "It's mind-boggling that they could run those ads and all of a sudden decide to close that plant."

Progresso's South Jersey roots were highlighted last year in ads: "In Vineland, it's all about the flavor."

Camden-based Campbell's Soup Co. complained those commercials falsely implied most Progresso soups were Vineland-made with local produce. An arm of the Council of Better Business Bureaus ruled the commercials gave an "unsupported message that most … ingredients are sourced in Vineland." General Mills had already stopped the ads at that time.

U.S. Rep. Frank LoBiondo, R-2nd, is not optimistic about convincing General Mills to stay in Vineland.

"They made it pretty clear to (Lt. Gov. Kim Guadagno) and me and the union president that the decision is irreversible," said LoBiondo, who used to deliver to Progresso and haul out loads of soup when he worked at his family's Vineland trucking firm.

"It's devastating news, and it's unconscionable how poorly they have handled this," LoBiondo said. "They really just hit us with a 2-by-4, and that's not the way to do business. It's not the way to treat employees at a plant that was profitable for a long time."

Guadagno also sounded resigned to Progresso's departure but said its facilities could still be attractive to other companies.

"We're confident we can fill this plant," she said via Twitter.

Still, Roemhildt, the General Mills spokeswoman, called the closing "tentative," not final.

"We'll start back up on our regularly scheduled shifts Monday, and we hope to begin discussions with the unions in the coming weeks," she said.

String called the recent contract negotiations "standard, tough bargaining, like it always is." He added that the workers even got raises in their new deal.

But now, "I feel like (the closing) is a done deal," he said. "They've closed other plants, mostly union plants."

String said Progresso "pays people living wages," but they're "all over the board. … A lot of it is predicated on the longevity they have with the company."

Progresso's own longevity dates to 1927, when the founding Taormina and Uddo families incorporated it. In 1942, they opened their first Vineland plant on Chestnut Avenue, and started cooking minestrone, lentil and other soups favored by Italian-Americans.

The families sold Progresso in 1969; a year later, the company built its current Vineland plant. It has been bought and sold by a collection of big food companies, including Pillsbury, Pet and General Mills, which bought the brand in 2001.

Roemhildt said the closing is no reflection on the workers.

"It's about excess capacity in our soup network," she said.

Contact: 609-272-7237
MDeangelis@pressofac.com

CRAIG MATTHEWS / STAFF PHOTOGRAPHER

Nelly Lorenzana, of Vineland, is one of hundreds of workers affected by the Progresso plant's planned closing in 2017. General Mills spokeswoman Kelsey Roemhildt says, 'We'll start back up on our regularly scheduled shifts Monday, and we hope to begin discussions with the unions in the coming weeks.' More photos and a video are with this story at **PressofAC.com.**

SWAT

Continued from A3

had not been located, police said.

Using a search warrant, officers found two handguns inside the residence, police said.

Tamera Poprik ran to the store only to return to find police and SWAT team members canvassing her street. Poprik had left her three boys at home in the unit above the incident.

"I went to the store and came back to this," said Poprik, 31, as she tried to talk to police to locate her children. "I just want to get my children."

Poprik was reunited with them after about half an hour.

"When I saw them, I had to touch them," Poprik said. "I'm happy this ended without any incident. This is usually a very peaceful street. When it was going on, I had all of my neighbors calling me and texting."

Poprik described the suspect as a quiet person who had recently moved in.

During the incident, Ventnor Avenue was closed from Raleigh Avenue to Columbia Avenue.

"I woke up to the sound of the police saying come out with your hands up," said Michael Fitchett, Poprik's 14-year-old son. "I tried to prepare my brothers for what was going on. I tried to stay calm. Luckily, we got out of there."

VIVIANA PERNOT / STAFF PHOTOGRAPHER

The SWAT team rescued Vincent Poprik, left, 10; Michael Fitchett, 14; and Nick Poprik, right, 11. Tamera Poprik, 31, of Atlantic City, says of her kids, 'When I saw them, I had to touch them. I'm happy this ended without any incident. This is usually a very peaceful street.'

Mazur praised the department's trained personnel and equipment, including the armored rescue vehicle.

"You may be in a personal crisis, but if you comply with the police officers, they are not there to hurt you," said Mazur, who added the neighbors were clapping and saying thank you after Holley was apprehended.

Contact: 609-272-7046
NHuba@pressofac.com
Twitter @ACPressHuba

Contact: 609-272-7202
VJackson@pressofac.com
Twitter @ACPressJackson

SCHOOL AID

Continued from A3

Christie's plan would distribute aid on a per-student basis, with each student worth about $6,600 in state aid. Under that plan, the township would get an extra $8.7 million per year.

School board President James Galvin said the board cut $8 million this year to stay within the state spending cap.

"We are one of the worst in underfunding," he said. "We have begged and begged, but it falls on deaf ears."

Sweeney, a Democrat, said his plan is more fair, because it would fund every district at 100 percent of what it should receive under the formula, though he said that would mean some districts that have been overfunded would lose aid.

"But how can you argue with everyone being treated the same?" he asked.

The plan would cost an additional $500 million, phased in as $100 million per year over five years.

Sen, Jim Whelan, D-Atlantic, said the Republican governor's plan makes a good sound bite but is not equitable.

"Kids from Pleasantville had higher needs than kids from Linwood," he said.

Sweeney asked officials to promote the plan to residents and have them write to their legislators.

Mayor James "Sonny" McCullough said he got a call from the Governor's Office asking him to support Christie's plan.

"I'll support anything that can pass," he said.

Sweeney said he believes his plan has more support.

Officials talked about how as a Pinelands growth area the township expanded rapidly in the 1990s, but state aid never kept up.

"At one time, we were the fastest-growing municipality in the state," said Township Administrator Peter Miller. "Now we're in a big (financial) hole."

Board member Pete Castellano said he is concerned that even if a new formula passes, the Legislature may not fund it in the budget process, which is what happened with the current formula, especially during the recession.

Castellano and board member Justin Riggs said after the meeting that the full board will discuss the issue at a public meeting to see if members want to support Sweeney's bill.

Contact: 609-272-7241
DDamico@pressofac.com

Wawa has 4-state hunt in yearlong coffee caper

BRIAN IANIERI
Staff Writer

WEST GOSHEN, Pa. — A woman who has stolen nearly $3,000 worth of Wawa coffee over the past year may be losing sleep at night.

Authorities say they have pictures of her and are asking for help to identify her.

Police said the woman stole bagged coffee from convenience stores 40 to 50 times in New Jersey, Pennsylvania, Delaware and Maryland.

"Wawa believes the thefts began in early 2016 and are ongoing," the department in Chester County said.

The woman is apparently not drinking the coffee, though. Police said she steals bags of coffee from one store and returns them to another Wawa for cash.

"In several of the thefts in March and April, the female is wearing scrubs, and it is possible she is a traveling health care worker," police said.

SUSPECT

Wawa surveillance cameras captured at least two different vehicles the woman has driven: a silver sedan and a maroon sport utility vehicle.

Anyone with information is asked to call police at 610-696-7400.

Wawa has more than 650 convenience stores in New Jersey, Delaware, Maryland, Pennsylvania, Virginia and Florida. It's the 36th largest private firm in America with nearly 27,000 employees and about $9 billion in revenue, according to Forbes.

Contact: 609-272-7253
BIanieri@pressofac.com

Attachment C

Public Meeting Transcripts

VINELAND CHEMICAL COMPANY SUPERFUND SITE

BLACKWATER BRANCH EXPOSED SEDIMENT/SOIL

PUBLIC MEETING

- - -

Monday, August 8, 2016

- - -

Hearing held in the above-captioned matter at Vineland City Hall - City Council Chambers, 640 East Wood Street, Vineland, New Jersey, 08360 at 6:30 p.m., there being present:

WANDA AYALA, COMMUNITY INVOLVEMENT COORDINATOR

MICHAEL SIBAK, ACTING BRANCH CHIEF

STEPHANIE VAUGHN, ACTING SECTION CHIEF

HUNTER YOUNG, REMEDIAL PROJECT MANAGER

ABBEY STATES, HUMAN HEALTH RISK ASSESSOR

- - -

WANDA AYALA: Thank you for coming to our meeting. This meeting is to discuss the proposed plan for the Vineland Chemical Company Superfund Site. As you guys know, the public comment period is from July 22nd through August 22nd. We're required by Superfund Law to have a transcript of these proceeding. That's why we have the stenographer, Kate, here recording it for us. I'm accompanied today by Hunter Young, who is the project manager for the Vineland Chemical Site. We have Stephanie Vaughn, who is the acting chief for the Mega Projects Section, Michael Sivak, who is acting branch chief for the Special Projects Branch, and we have Abbey States, who is our risk assessor.

I'd like to acknowledge any local officials, besides Dale, that are attending. Please put your phones on vibrate so we don't disrupt the meeting and we're going to take comments and questions after the presentation.

STEPHANIE VAUGHN: Hi, everyone. I'm just going to very quickly go through the Superfund process. This site is on the national priorities list, otherwise known as the Superfund List, and there is a lengthy process for determining if a site is eligible to be put on the list and be eligible for federal funds and efforts, and then there's a lengthy process once the site is on the list. So basically we start out with a preliminary assessment and site inspection and determine if it warrants being on the list. This particular site, the Vineland Chemical, was listed way back in the '80s. So this has been on the Superfund List for a very long time.

Once it is determined that it is on the list, we initiate what's called a remedial investigation where we investigate the site. We look at all the different media, the soil, the sediment, the groundwater, whatever is appropriate, the surface water, and we determine the nature and extent of the contamination. We determine where the contamination came from and where it is going. We also do things like look at the site history to determine how the contamination got there, what the operations of the facility were, what the ownership history was. We look for parties that may be responsible for the contamination and try to both hold them responsible and also to gain information from people who may have been involved, so that we just gain an understanding of what happens at the site and what we may expect to find. Then we follow it up with appropriate investigations to see what is present.

Once we finish that, we also do a risk assessment during that process. We determine the risk posed by that site to both human health and the environment. Once we complete that process, assuming we find there are unacceptable, then we do what's called a Feasibility Study. We determine how the contamination at the site should be addressed. We evaluate a number of options, including no action. We would do that whether there were risks or not, but we evaluate a series of remedies for the site, and then we, EPA, come up with what we think is the best option for the site. Then we put out what's called a proposed plan and that is the point in the process that we are at now. You may have all seen or have copies of the proposed plan for this part of this site. Hunter will get into that into more detail. This site was divided into several different pieces or operable units.

With the proposed plan, there's a 30-day public comment period where people can read about it. They can ask us questions. We hold this public meeting. They can submit comments, either verbally or in writing. And at end of that 30-day process or however long it ends up being, we issue what's called a Record of Decision and that is our path forward for that site or the section of the site.

In this particular case, what we are looking to do is actually an amendment to the original Record of Decision for this site that was signed in '89. So then once we make a determination on how to proceed, we move into remedial design and remedial action stage. Once we sign the Record of Decision, we will start designing the remedy, figuring out all the details of how we actually implement what might be a conceptual idea in the Feasibility Study, and then we implement that in remedial action.

Finally, at some point we finish our work, construction completion. We go to operations and maintenance as necessary and eventually the site may be deleted from the

Superfund List, if possible. Throughout this whole process, there is community involvement and that's a key part of the process, to hear what the public has to say and their input. People have lived in this community for a long time, and they really know things about the area and about the site and about potential future uses, and many other things that we just can't know. So it's a valuable part of our process, and we also try to keep in mind re-use of the site throughout the whole process. That's ultimately what we want to do, return these sites to productive use for the communities. I think that's it.

HUNTER YOUNG: So that brings us here to Vineland and the Vineland Chemical Company Superfund Site. More specifically, here in Vineland, we have the site itself right here and we're looking at the Blackwater Branch today. That's the part of the site we're going to be talking about. Here you have the Maurice River, which that drains into, and that actually leads to Union Lake. The Vineland Chemical Company is an old herbicide and fungicide plant, started operations in 1949 and operated until 1994. In the '60s, New Jersey Department of Health observed some untreated wastewater dumping into some unlined lagoons. This resulted in some contamination in of the groundwater, which eventually contaminated surface water bodies, and the soil in the surrounding area became contaminated.

Eventually, in 1989, we signed a Record of Decision outlining a clean up for the site. Here's a picture taken quite a while ago, probably '90s. You can see Vineland Chemical Site is here. This is the Blackwater Branch, eventually leading out to the Maurice River. So the Record of Decision broke the site up into four different operable units. Operable units are ways that EPA breaks Superfund sites, breaks it down categorically, to make it more manageable. We break them down by area: North, south, east, west. We break it down by media. So maybe it is groundwater, surface water, air. For Vineland Chemical, we broke it into four sites: First, site soil; second, groundwater; third, the river area and sediments, which is Blackwater Branch and the Maurice River; and fourth, Union Lake. Here's a little diagram of the different operable units. You can see a groundwater plume over here. That's Unit 2. The site itself over here, Unit 1. Here is Blackwater Branch and Maurice River. That's Unit 3. Downstream you've got Union Lake.

So just to talk a little bit more about the site history, in 1984, it was added to the National Priorities List, as Stephanie mentioned earlier. In 1989, signed the ROD or Record of Decision. In March of 2000, we started groundwater pump-and-treat to contain the groundwater plume and contain contamination and treat that groundwater. In December 2007, we completed cleaning the soil on site and we began cleaning up Blackwater Branch. So we went in and we dredged the river. However, in 2010, we found recontamination happening. We found some seeps in groundwater discharging out of the floodplain and recontaminating those sediments. In 2012, we finished the clean up of Blackwater Branch that was outlined in the original Record of Decision. In 2014, we transferred the groundwater treatment to the State of New Jersey, and then here we are today moving forward to the proposed plan, which is going to address that recontamination that we talked about earlier.

Here's a picture of what it looks more like today. Here is the site now. Some of these buildings are actually gone now. Here's Blackwater Branch. You can see how it's engineered. This is actually what we did while we were realigning this draining. We built a new stream channel and then took the old stream channel, cleaned it out. Then, eventually, after this photo was taken, set that stream back into its old channel. So we are here now to do this ROD Amendment because we found recontamination and we found that we need to make a decision to change that remedy in order to address the recontamination. The Record of Decision documents remedial action. The ROD Amendment is when a fundamental change needs to be made to the remedy and that's what we believe needs to happen. And, specifically, within Operable Unit 3, which is the river area sediment. We're specifically talking about Blackwater Branch and just the exposed sediment in Blackwater Branch. This is where we kept seeing these seeps of recontamination.

We did some sediment sampling between 2010 and 2015, and we confirmed that recontamination was happening. That sampling led us to point out three distinct areas. We've been calling them Areas A, B, and C. These are three areas of our main focus, but there is the option of other areas being included. We looked at these three areas and we completed some bench scale and pilot studies. These are test things that you do in a laboratory and small tests in the field to determine the effectiveness of different treatments. We used this information to develop Focus Feasibility Study. Focus Feasibility Study outlines several different remedial actions that we can take and compares them against each other to see which one is most effective. We also looked at risk. We looked at how contamination of the site effects human health, and we looked at how it effects ecological health.

Then we outlined goals and objectives for our Record of Decision Amendment. We decided one of our main goals was going to be reducing arsenic contamination in the sediment and, second, would be to prevent those from being recontaminated. So we want to clean it up, and we want to make sure it stays clean. We outlined a sediment clean-up goal of 19-milligrams per kilogram, which is the state standard. We put forth a proposed plan out of three different alternatives. The first alternative was no action, which is required under the Superfund process. It acts as a baseline to compare the other alternatives against. The second alternative was Ongoing Hot Spot Excavation. The third alternative was In-Situ Treatment, Hot Spot Excavation, Performance Monitoring.

Alternative 1, not even going to talk about anymore. Alternative 2, is Ongoing Hot Spot Excavations. So we would periodically go in and dig out the contaminated sediments. We estimated approximated every three months we have to dig up and dispose of them off-site. Alternative 3, In-Situ Treatment, Hot Spot Excavation, Performance Monitoring. The in-situ treatment is going to be a chemical treatment in place. We can implement this remedy without having to remove the media that we're treating. So with this remedy, we would sort of do a surgical approach and apply in-situ treatment, excavation, and monitoring in all of the areas in order to effectively clean up the sediment. So we would go in and, you know, sometimes we might have to do excavation up front in order to clean up some already contaminated sediments, and then we would implement in-situ treatment to prevent them from becoming contaminated, and we would do some monitoring to make sure that it doesn't become recontaminated.

So we took those three alternatives and we compared them against nine criteria that are in Superfund process. The first two, and the most important, are overall protection of human health and the environment. Second, is compliance with applicable or relevant and appropriate requirements, which are state and federal laws. Then we look at the balancing criteria, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, is this technically feasible, and of course, we look at cost. Lastly are the ongoing criteria that we look at, which are state acceptance and community acceptance. We always want the state to agree with our remedy, and we always want the community to agree with our remedy. We went through that process and we determined Alternative 3 to be the most effective treatment, which is in-situ treatment, the excavation, and the monitoring.

This satisfies the two important threshold criteria, achieves the best combination of all five of the balancing criteria, and achieves our remedial action objectives and our community goals. So, again, to touch on in-situ treatment just to make sure everyone understands, these are technologies that are place. Some examples of those would be air sparging, injecting air into the ground, other chemical injections, PH adjustments, reactive barriers. The final such of the type of technology that we use will be made after we do further studies and more testing throughout the remedial design phase. As we learn more about the site, we will identify exactly what type of treatment technology we need.

So the next steps are to sign the Record of Decision, develop remedial action plan, implement the remedy. Hopefully, all that will go well. Then we are going to eventually look at other contamination that is part of the Vineland site. We might need to re-evaluate the groundwater. We're going to look at Union Lake downstream, and we're always monitoring Maurice River. So public comment period lasts through August 22nd. You can write comments to me specifically. My address and e-mail are on the website and they're on the proposed plan. We will also accept comments in this meeting verbally or written. That's all. Any questions?

WANDA AYALA: Comments?

HUNTER YOUNG: Thank you.

WANDA AYALA: The meeting is adjourned. Thank you so much for coming.

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(Whereupon, the hearing was concluded at approximately 6:55 p.m.)

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CERTIFICATE

- - -

I hereby certify that the witness was duly sworn by me and that the deposition is a true record of the testimony given by the witness.

____

KATE M. REGENSBURGER
Professional Court Reporter
Notary Public

(The foregoing certification of this transcript does not apply to any reproduction of the same by any means, unless under the direct control and/or supervision of the certifying reporter.)

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Attachment D

Written Comments

Young, Hunter

From: Jones Dale <djones@vinelandcity.org>
Sent: Tuesday, August 09, 2016 3:39 PM
To: Young, Hunter
Cc: Mayors Office; Fanucci Anthony R; Tonetta Richard; Dickinson(Health) Robert; Dickenson Bob; Lopez Emma
Subject: Vineland Chemical Company Super Fund Site

Hunter,

Please accept this email as comment to the EPA's proposed plan to amend the approach to remediate contaminated exposed sediment/soil of the Blackwater Branch floodplain that is associated with the Vineland Chemical Company Superfund site located in Vineland, New Jersey. I was in attendance at your August 8, 2016 public meeting which was held at City Hall regarding this matter. During this meeting you discussed the remedial action objectives and three remedial alternatives in addressing the contaminated sediment/soil in the floodplain of the Blackwater Branch. Presently there is groundwater that is discharging in the Blackwater Branch in certain areas and is recontaminating the sediment within the floodplain of the Blackwater Branch. I support the EPA's decision to use alternate #3 which is the in-situ treatment, hot spot excavation and performance monitoring as an amendment to the original plan. Hopefully this alternative will provide a more permanent solution to the area being recontaminated. The in-situ technology will be monitored and adjusted as needed which makes more sense than constantly removing the soil/sediment each time it is recontaminated and not addressing the source.

Respectfully submitted.

Dale Jones
Health Director
Vineland Health Department
640 E. Wood Street, Vineland NJ 08360
P]856-794-4000 *4115
F]856-405-4608
E]djones@vinelandcity.org

Visit our website at www.vldhealth.org