Superfund Program
Proposed Plan

U.S Environmental Protection Agency
Region 2

Diamond Alkali Superfund Site OU1

80-120 Lister Avenue, Newark, NJ

September 2024

EPA ANNOUNCES SUPERFUND PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered to address contaminated soil and groundwater at Operable Unit 1 (OU1) of the Diamond Alkali Superfund Site (Site) located at 80-120 Lister Avenue in Newark, New Jersey (Figure 1) and identifies EPA's preferred remedial alternative along with the rationale for this preference.

An interim remedy to secure and contain contamination is currently in place at OU1 and includes a slurry wall and floodwall to contain subsurface contamination, a cap to prevent contact with contaminated material and also to prevent surface water infiltration, and a groundwater extraction system to prevent the migration of contamination. The interim remedy has been in operation since completion in 2004 and the performance monitored via groundwater sample collection and analysis. The preferred remedial alternative would be a final remedy for OU1 and would be an improved, optimized version of the current existing interim remedy.

Figure 1 – Site Location

MARK YOUR CALENDARS

Public Comment Period
September 10, 2024 to October 10, 2024
EPA will accept written comments on the Proposed Plan during the public comment period. To request an extension, send a request in writing to Eugenia Naranjo by 5:00 PM on October 9, 2024.

Public Meeting
September 19, 2024 at 6:00 P.M.
EPA will hold a hybrid public meeting to explain the Proposed Plan and the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at NJIT (New Jersey Institute of Technology), Central King Building, room 303, 100 Summit St, Newark, NJ 07103.Newark, New Jersey. Zoom link: https://bit.ly/listerave91924

EPA's website for the Diamond Alkali Site is:
https://www.epa.gov/superfund/diamond-alkali
For more information, see the Administrative Record at the following locations:

EPA Records Center, Region 2
290 Broadway
New York, New York 10007-1866
(212) 637-3000
Hours: Monday-Friday – 9 A.M. to 5 P.M.

Newark Public Library
Van Buren Branch
140 Van Buren Street
Newark, New Jersey 07105
(973) 733-7750
Please refer to website for hours:
https://www.npl.org/community-libraries/van-buren-branch/

This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency. EPA, in consultation with NJDEP, will select the final OU1 remedy 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 Proposed Plan. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

EPA is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The remedial alternatives summarized in this Proposed Plan are described in greater detail in the *Final Feasibility Study: Diamond Alkali Superfund Site* (June 2024) (2024 FS Report). This report and other documents are part of the administrative record file for the Site and are publicly available as electronic documents from EPA's website, which can be found in the "Mark Your Calendars" text box, and at the designated information repositories. EPA and NJDEP encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been completed at the Site to date.

EPA's preferred plan for OU1 is Alternative 2, the Optimized Containment Remedy, which consists of the Interim Remedy that is currently operating at OU1 with a number of improvements to optimize it, making it more effective and protective. These optimizations consist of:

- Replacement of extraction wells EW-1 through EW-6, located along the floodwall bordering the Lower Passaic River, to position the well screens more accurately in the fill layer beneath the site's cap and improve their effectiveness in achieving hydraulic containment.
- Reactivation of extraction well EW-9 on the south side of the Site.
- Redesign and replacement of the groundwater conveyance system, as needed.
- Upgrade of the Groundwater Treatment System (GWTS), as needed.
- Investigation of the integrity of the existing cap layers via a Site-wide electrical resistivity survey and subsequent repairs, if needed.
- Installation of additional groundwater monitoring wells, if needed.
- Maintenance of the OU1 cap, maintenance of the GWWS and GWTS, and long-term monitoring in perpetuity
- Institutional Controls

The OU1 site features are shown on Figure 2, located at the end of this Proposed Plan.

COMMUNITY ROLE IN THE REMEDY SELECTION PROCESS

This Proposed Plan is being issued to inform the public of EPA's preferred 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 from the preferred alternative 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, in consultation with NJDEP, has taken into consideration all public comments. This Proposed Plan has been made available to the public for a public comment period that concludes on October 10, 2024.

A public meeting will be held during the comment period on September 19, 2024 to provide information regarding the alternatives considered and the preferred alternative, as well as to receive public comments. The public meeting will include a presentation by EPA of the preferred alternative and other cleanup options evaluated for OU1. Information on the public meeting and submitting written comments can be found in the "Mark Your Calendars" text box on Page 1 of this document. Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), along with EPA's responses.

A community involvement plan has been developed and it is part of the administrative record. It can be found at the EPA website listed in the "Mark Your Calendar" box and at www.ourpassaic.org.

SITE DESCRIPTION

The OU1 of the Diamond Alkali Superfund Site consists of two properties located at 80 and 120 Lister Avenue in the Ironbound neighborhood of Newark, NJ, comprising 5.8 acres of land adjacent to the Lower Passaic River. OU1 is bordered by industrial properties to the east, west, and south and by the Lower Passaic River to the north. The adjacent industrial properties have also been contaminated by past operations and are being investigated under cleanup programs overseen by the NJDEP.

The current land use for the area is industrial and includes ongoing operation and maintenance activities associated with the interim remedy currently in place at OU1. A deed notice is in place for OU1 to provide notice of conditions at the properties and ensure that the cap placed over the property as part of the interim remedy is not disrupted. The immediate area surrounding OU1 is zoned for industrial use and will continue to be so, according to the 2015 Newark Zoning and Land Use Regulations.

Nearby areas have a dense residential population, including public housing constructed by the City of Newark. The Ironbound section of Newark is highly industrialized but also densely populated and is burdened with numerous environmental concerns. The Ironbound neighborhood is located in the East Ward of the city and houses approximately 50,000 of Newark's 275,000 residents. This neighborhood encompasses approximately four square miles and is home to a sizeable population of Portuguese-American and Brazilian-American ethnicity.

ENVIRONMENTAL JUSTICE

EPA conducted a review of the project vicinity using EPA's EJSCREEN online tool and via review of aerial imagery (accessed through Google Maps) to identify the locations of residential areas. EPA completed this screening to create a common starting point between the agency and the public when looking at issues related to environmental justice (EJ). Screening is a useful first step in understanding or highlighting locations that may be candidates for further review; however, it is essential to remember that screening-level results do not, by themselves, determine the existence or absence of EJ concerns at a given location. The EJ and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJSCREEN reflecting twelve environmental indicators. Particularly elevated environmental indicators found at OU1, and the surrounding area (as compared to national averages) include poor air quality, cancer risk, traffic density, lead paint prevalence, proximity to sites with chemical management plans and hazardous waste facilities, and occurrence of wastewater discharges.

A one-mile buffer and five-mile buffer surrounding OU1 were applied for the generation of the EJSCREEN reports. The one-mile buffer screening offers demographic information on the immediate project area, while the 5-mile buffer screening provides a larger, regional context for those demographics. Demographic indicators from the one-mile buffer screening indicate there are people of color, low-income populations, and linguistically-isolated populations in the immediate project area, where the percentages of these populations are greater than the state averages by margins of 20 percentage points or greater (see table below).

Demographic Indicator (Population Percentage)	**1-mile Buffer**	**5-mile Buffer**	**NJ State Average**
People of Color	67%	80%	44%
Low Income	47%	41%	24%
Linguistically Isolated	32%	14%	7%

The findings of this analysis will be used to ensure that the outreach efforts EPA is making are reasonable and appropriate.

SITE HISTORY

The property located at 80 Lister Avenue was used for manufacturing purposes by numerous industrial companies for over 100 years. The mid-1940s marked the beginning of the manufacturing operations related to the conditions that require cleanup, including the production of dichloro-diphenyl-trichloroethane (DDT) and phenoxy herbicides by Kolker Chemical Works, Inc. The Diamond Alkali Company acquired the northeastern portion of the 80 Lister Avenue property in 1951 and produced various chemicals and pesticides, including sodium trichlorophenol, 2,4-dichlorophenol, monochloroacetic acid, and the byproduct hydrochloric acid; 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), and their esters and amines; as well as sodium 2,4,5-trichlorophenate (Na-TCP). The Diamond Alkali Company also manufactured agricultural chemicals, including the defoliant known as Agent Orange, which is a mixture of 2,4-D and 2,4,5-T. A by-product of these manufacturing processes was the dioxin congener 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), which is extremely toxic.

In February 1960, an explosion at the Site destroyed a large five-story building. At the time of the explosion, the remaining, southwestern portion of the 80 Lister Avenue property was leased by the Diamond Alkali Company to rebuild the plant at a larger scale. Plant operations were later discontinued in August 1969.

In September 1969, the Diamond Shamrock Corporation, corporate successor to the Diamond Alkali Company, decommissioned the Site. The plant was listed for sale and remained idle until it was purchased by Chemicaland Corporation (Chemicaland) in March

1971. Chemicaland carried out final manufacturing activities, including manufacturing of benzyl alcohol and 2,4-D at the 80 Lister Avenue property from 1971 through 1977. Between 1977 and 1983, various owners operated on the property.

In May of 1983, EPA and NJDEP conducted sampling at the Site under the National Dioxin Strategy, which targeted facilities that produced 2,4,5-trichlorophenol (TCP) and its pesticide derivatives (such as 2,4,5-T) for investigation. Sampling results revealed high levels of dioxin, in particular 2,3,7,8-TCDD, at the 80 Lister Avenue property. Pesticides, volatile organic compounds (VOCs), and other hazardous substances were also present. Contaminants were found in both soil and groundwater at OU1, with a lesser degree of contamination detected at the adjacent 120 Lister Avenue property. In 1984, Diamond Chemicals Company acquired 120 Lister Avenue to assist with the cleanup. In 1986, by then known as Diamond Shamrock Chemicals Company (DSCC), it repurchased the property at 80 Lister Avenue.

Based on these investigations, EPA and NJDEP initiated several emergency response actions to control and limit access to the Site:

- The properties at 80-120 Lister Avenue were secured with a 24-hour guard service;
- Exposed soils on the property were covered with geofabric to prevent contaminant migration; and
- Dioxin-contaminated soils and debris from other properties were removed via excavation, vacuuming, and other means and transferred to 120 Lister Avenue for storage.

EPA proposed the addition of the Site to the National Priorities List (NPL) in September 1983, and this addition was finalized on September 21, 1984. Also in 1984, NJDEP issued two Administrative Consent Orders to DSCC: the first required DSCC to undertake the investigation and immediate response work conducted at 80 Lister Avenue, and the second encompassed the investigation and response work conducted at 120 Lister Avenue.

From 1984 to 1987, with oversight by NJDEP, DSCC, and later Occidental Chemical Corporation (OCC), the corporate successor to the Diamond Alkali/Diamond Shamrock Company, completed Site Investigations and a Feasibility Study (FS) for 80-120 Lister Avenue. The Site Investigations and FS showed that the 80-120 Lister Avenue properties were contaminated by numerous hazardous substances including dioxin, semi-volatile organic compounds (SVOCs), VOCs, herbicides, pesticides, polychlorinated biphenyls (PCBs), and metals. The contamination was widespread and affected site soils, groundwater, ambient air, surface water, and building structures. The chemicals that were determined to present the greatest risks due to their toxicities and concentrations were 2,3,7,8-TCDD and DDT.

On August 1, 1987, EPA issued the Proposed Plan for OU1 of the Site, and on September 30, 1987, EPA issued a ROD selecting an interim containment remedy (the current Interim Remedy). The Interim Remedy consisted of placement of remediation waste and building demolition debris within a containment cell, capping of the OU1 properties, construction of subsurface slurry walls and a floodwall to surround the OU1 properties, and a groundwater collection and treatment system. The Interim Remedy prevents exposure to contaminated media and debris and prevents further releases to the Lower Passaic River.

Once the remedy had been selected, OCC entered into a judicial Consent Decree with EPA to perform the Remedy Design/Remedial Action (RD/RA), which was approved by the court in 1990. OCC performed the RD between 1990 – 1999, with EPA approving the final design report in 1999. During this time, OCC explored the potential for implementing an alternative to the interim remedy selected in the 1987 ROD, but a viable alternative was not found. OCC constructed the remedy under EPA supervision between 2000 and 2004. Construction of the Interim Remedy at the Site was carried out by OCC under EPA oversight and was completed in 2001. The Interim Remedy is described in more detail in the 1985 FS Report (October 1985) and the *Final Report for Remedial Construction* (August 2004)

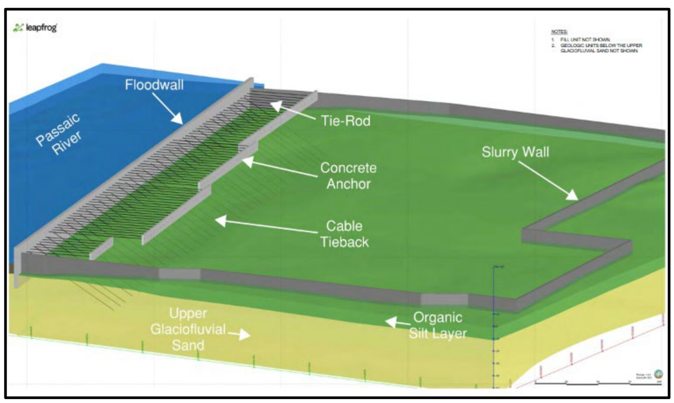

Figure 3 – Floodwall and Slurry Wall Features

Since 2001, five reviews of the performance and the protectiveness of the interim remedy have been completed and documented in Five-Year Reviews, with the most recent review concluding that the interim remedy is generally functioning as designed and remains protective of public health and the environment.

SITE CHARACTERISTICS

Previous Sampling Efforts and Results

OU1 has been methodically evaluated through various investigations carried out under the oversight of EPA and NJDEP. The results of these studies are detailed in the 1985 FS Report, the 1985 Site Evaluation Reports for 80 and 120 Lister Avenue, the Site Evaluation Report Addendum (October 23, 2020) and the Annual Groundwater Reports submitted by Glenn Springs Holdings on behalf of OCC. The February 1985 Site Evaluation Report included data and a conceptual site model of OU1 based on physical characteristics of the area and the nature and extent of contamination.

Physical Characteristics of the Site

The 80-120 Lister Avenue properties have a total size of 5.8 acres; this acreage represents the geographical area designated as OU1. Of these 5.8 acres, 3.5 acres are at 80 Lister Avenue and 2.3 acres are at 120 Lister Avenue. The containment cell constructed as part of the interim remedy, with two sections referred to as Areas A and B, spans both the 80 and 120 Lister Avenue properties.

The properties are currently fenced and secured with an electronic, automated security system to prevent unauthorized access. Contaminated soils and debris are contained within the fenced area under an impermeable cap system, the surface layer of which is composed of gravel. On the west, south, and east sides of the Lister Avenue properties, all cap layers extend across the top of the slurry wall where runoff/lateral drainage is collected in and conveyed to the stormwater collection system. A wedge of compacted clay was placed on top of the slurry wall prior to construction of the cap to form a low permeability connection to the cap. On the north side of the Lister Avenue properties, cap layers terminate at the floodwall. Additional features at the OU1 properties include equipment and structures associated with the operation of the interim remedy in place at the Site. These include a groundwater withdrawal system (GWWS), a groundwater treatment system (GWTS), an office support building, and access roads. Subsurface features include groundwater monitoring wells, groundwater extraction wells, gas vents, piezometers, a groundwater conveyance system, slurry trench cutoff walls, and a floodwall. A pictorial figure of the floodwall and slurry wall features is provided as Figure 3.

Site Geology and Hydrogeology

The geology of OU1 consists of non-native fill that was placed in the late 1800s, below which is an organic silt layer comprising native wetland and river bottom sediments, and glaciofluvial deposits that are below the silt layer. The top of the fill layer was the former site grade before remediation. The thickness of the non-indigenous fill varies, and it is thickest where the organic silt layer is thinnest. The thickness of the native organic silt layer also varies, but it generally decreases from the

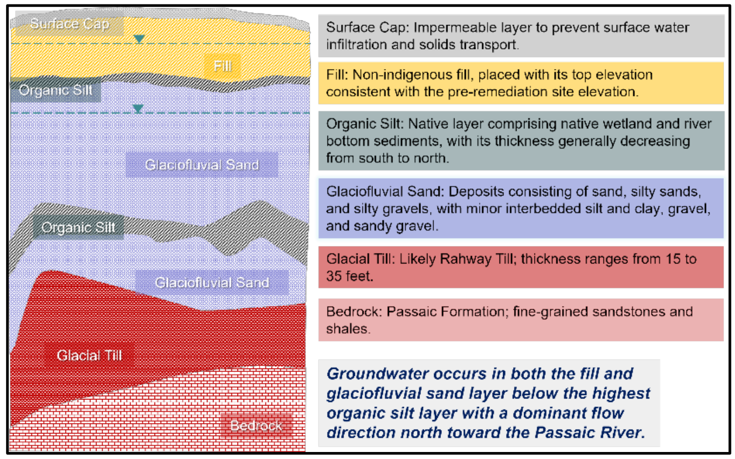

Illustration – OU1 Geology and Hydrogeology

south to the north. Results of recent investigations indicate that the silt layer is continuous beneath the property, although its upper surface elevation varies by several feet. The organic silt reduces the hydraulic connection between the fill and the underlying sand layer, reducing the downward migration of contaminants. The glaciofluvial deposits underlying the organic silt layer include sands, silty sands, and silty gravels, with minor interbedded silt and clay, gravel, and sandy gravel.

Groundwater at OU1 occurs in the fill layer above the organic silt layer and in the sand layer below the organic silt layer. The dominant groundwater flow direction is to the north towards the Lower Passaic River. OU1 geology and hydrogeology are illustrated above.

Components of the Interim Remedy

In 1987, when the interim remedy was selected for OU1, few remedial options existed for disposal of remediation waste contaminated with dioxin classified under the Resource Conservation and Recovery Act (RCRA) as listed waste. The manufacturing operations at OU1 had generated listed dioxin (F020) wastes under RCRA and its implementing regulations. The origin of the soil containing phosphorus is not known; however, because the material reacted on contact with air, it is considered a characteristic (reactive) waste under RCRA and assigned a classification of D003. The 1987 ROD identified that F020 and D003 wastes were subject to Land Disposal Requirements (LDRs) under RCRA, which required that the threat posed by the waste must be fundamentally changed by treatment to identified standards prior to disposal in a domestic landfill:

- F020 waste contaminant levels must be reduced by at least 90 percent of their initial concentration via treatment and to less than ten times the Universal Treatment Standard (UTS) for the hazardous constituents; and
- D003 waste must be "de-characterized" to remove the hazardous characteristic.

Given the sparse options for disposal, EPA and NJDEP selected an interim remedy in the 1987 ROD, stating that the contaminated materials would be secured and contained at OU1 until an appropriate technology becomes available.

CERCLA Section 121(d) specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains applicable or relevant and appropriate requirements (ARARs) under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4). As noted, the manufacturing operations at OU1 had generated RCRA-listed dioxin wastes, as well as other wastes subject to multiple RCRA requirements relating to treatment and disposal. The 1987 ROD and the 1990 Consent Decree governing the cleanup explain and document that EPA waived several provisions of RCRA concerning best demonstrated available treatment (BDAT), LDRs, and landfill requirements pertaining to liners and leachate collection systems, invoking the greater risk associated with attempted excavation of the waste (CERCLA Section 121(d)(4)(B)) and the equivalent standard of performance (CERCLA Section 121(d)(4)(D)). While not explicitly cited as a basis for a waiver, the 1987 ROD also referred to the interim nature of the remedy.

The judicial Consent Decree calls for a periodic re-evaluation of the remedy, the primary purpose of which is to develop, screen, and assess remedial alternatives, and to assess the performance of the selected remedy, until a final remedy could be selected for OU1.

A Remedy Evaluation Work Plan (REWP), which is attached to the 2024 FS Report as Appendix A, was developed in 2015 to guide the required evaluation of the interim remedy. OCC submitted several iterations of a Remedy Evaluation Report (RER) to EPA by January 2021. Following EPA review of the January 2021 Draft RER, EPA determined that the January 2021 Draft RER satisfied the Consent Decree requirement to perform a remedy evaluation and that it should be revised into an FS to comparatively evaluate remedial alternatives, which led to the submission of the 2024 FS Report. The RER and correspondence are included in the administrative record.

The OU1 interim remedy, as implemented by OCC, consists of the following components:

- A slurry trench cutoff wall encircling the 80-120 Lister Avenue properties and tied into the silt layer underlying the properties.
- A floodwall along the Lower Passaic River to protect the properties from the 100-year flood.
- Demolition of former plant buildings and equipment, followed by decontamination of non-porous materials to the maximum extent practicable for off-site reuse, recycling or disposal.
- Transportation off-site for treatment or disposal of drums containing hazardous substances but containing less than 1 part per billion (ppb) of dioxin.
- Stabilization and immobilization of the contents of the remaining drums of dioxin-contaminated materials.
- Containment of all materials contaminated above 1 ppb of 2,3,7,8-TCDD on-site, including contaminated materials recovered from off-site locations, demolition debris, and other remediation wastes. Secured materials were separated to the maximum extent practicable based on contaminant concentrations to Area A or Area B, to afford access to and facilitate removal of the more highly contaminated materials, should such removal be selected as a remedy at a later date.
- Hauling, emptying, spreading and compacting the contaminated materials previously stored at 120 Lister Avenue, and decontaminating the shipping containers for off-site reuse, recycling or disposal.
- Locating and plugging inactive underground conduits and rerouting active systems.
- Installation, operation, and maintenance of a GWWS designed to maintain an inward hydraulic gradient to prevent the migration of groundwater from within the slurry wall.
- Installation, operation, and maintenance of a treatment system for groundwater and other aqueous liquids.
- Capping of the entire OU1 with an engineered, multi-layer cap consisting of, from bottom up (see cap system cross-section illustration below):
    - 6-inch subgrade layer covered with non-woven geotextile fabric
    - 12-inch gas venting layer of crushed stone covered with geosynthetic clay liner (GCL)
    - 60-mil high-density polyethylene (HDPE) textured geomembrane
    - Geocomposite drainage layer (triplanar HDPE geonet sandwiched between 2 layers of geotextile fabric)

- 18-inch Select Fill layer covered by GCL covered by non-woven geotextile fabric layer
  - 6-inch crushed stone surface layer
- Implementation of suitable monitoring, contingency, operation and maintenance, and site security plans to ensure the protection of human health and the environment during and after the construction of the Interim Remedy.
- On-site placement and capping of all sludge generated from the wastewater treatment processes until such time that an alternative method of sludge management is approved.
- Design, construction and operation of the remedy to attain the cleanup standards listed in Tables III, V, VII of Section VIII of the 1987 ROD.

The floodwall infrastructure consists of tie-rods, tiebacks, and concrete anchor walls.

While the 1987 ROD also required performing a Feasibility Study every 24 months following the installation of the selected interim remedy to develop, screen and assess remedial alternatives and to assess the performance of the selected remedy, as described above, EPA determined that the remedy evaluation that began in 2015 and was completed in 2021 met this requirement.

Please see Figure 2 at the end of this document for a current plan showing OU1 of the Site, including the Interim Remedy features that were constructed from 2000-2004.

Based on monitoring data and observed trends, operation of the GWWS resulted in the following:

- A decrease in groundwater levels within the slurry wall since construction of the interim remedy was completed;
- Generally inward horizontal gradients across the slurry wall; and
- Separation of hydraulic systems inside and outside of the slurry wall.

Since 2001, as a result of the remedy evaluation process, EPA has conducted additional review of the above trends. The results are documented in the annual groundwater monitoring reports, as well as in the Five-Year Reviews and the Site Evaluation Report Addendum. While inward gradients have generally been established, upward hydraulic gradients are not being and will not be fully achieved in significant portions of OU1 due to a number of issues, including the construction of several of the existing extraction wells (which are not screened at an optimal stratum/depth). Additionally, the evaluation noted that there may be a need for additional maintenance/repair of the cap system.

NATURE AND EXTENT OF CONTAMINATION

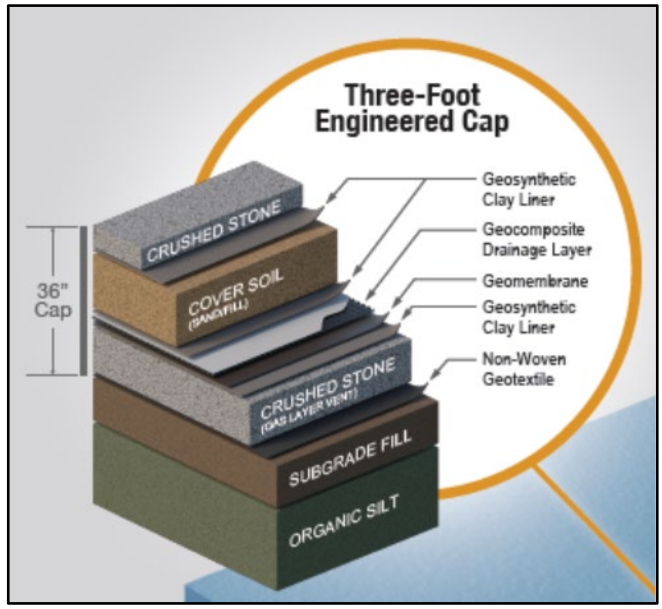

Illustration - Cap System Cross-Section

Much of the contaminant mass present at OU1 was released to the Site soils during the late 1940s through l960s by manufacturing operations at the Diamond Alkali facility. Over time, soil contaminants migrated to groundwater within the fill located above the organic silt layer. A summary of contamination within each of the major environmental media at OU1 is provided below.

Soil and Buried Impacted Materials

Impacts in the fill material at the Site that existed prior to implementation of the Interim Remedy were characterized in the mid-1980s and summarized in the 1985 Site Evaluation Report for 80 Lister Ave. The fill was found to contain 2,3,7,8-TCDD, VOCs, SVOCs, pesticides, herbicides, PCBs, and metals. These investigation activities indicated that the highest impacts to the fill occurred in the north-central and northwestern portions of the Site, which is where the former Chemical Manufacturing Building and Process Building were located prior to demolition. The implementation of the Interim Remedy from 2000 to 2004 resulted in the redistribution of some impacted portions of the fill within the Site.

The 1985 Site Evaluation Report for the 80 Lister Avenue property documented that detected dioxin concentrations in the surface soils (0-6 inches below grade) ranged from 0.39 to 9,050 ppb. For the 6–12-inch depth, dioxin concentrations were detected between 1.2 to 3,690 ppb. The detected concentrations in the 12–24-inch depth interval were 0.92 ppb to 19,500 ppb. Samples collected immediately above the organic silt layer contained dioxins ranging from non-detect to 71.8 ppb.

At 120 Lister Avenue, site investigations performed by DSCC in the 1980s revealed six areas of dioxin contamination greater than 7 ppb, a value established in the administrative consent order NJDEP issued to Diamond Shamrock in December 1984. These areas were excavated to depths ranging from six to 24 inches below grade, at the direction of NJDEP. The excavated soil was containerized on site and later placed in Areas A and B (see Figure 2); however, in several of the areas, the underlying soils still contained dioxins in excess of 7 ppb, as per the 1985 Site Evaluation Report for 120 Lister Avenue.

Most of the impacted fill material was placed in Areas A and B in the central portion of OU1 (see Figure 2) during the implementation of the Interim Remedy along with other impacted materials, followed by compaction and grading before constructing the surficial cap to contain the contaminants and wastes. In addition, impacted materials generated by OU1 demolition activities (i.e., building debris) were also placed in Areas A and B during Interim Remedy construction.

It is important to note that the Site soils surrounding and beneath Areas A and B are also contaminated with dioxins at concentrations that required remediation. The present-day areas of greatest impacts generally occur in the central to northwestern portions of OU1 which largely correspond with 80 Lister Avenue. This includes impacts to: 1) contaminated fill beneath the floodwall anchorage structures from former operations; and 2) contaminated fill within and beneath Areas A and B in the central portion of OU1, which were contaminated by former operations and may have been further contaminated by placement of impacted materials in Areas A and B during construction of the Interim Remedy. To clarify, remediation wastes that were added to Areas A and B were placed and compacted above existing contaminated soils and in shallow trenches, such that both the wastes and fill material below the cap system at 80-120 Lister Avenue are contaminated from the bottom cap layer to the surface of the organic silt layer. The tiebacks and anchor structures of the floodwall were also constructed above existing contaminated soils.

Soils located to the south of Areas A and B, primarily at 80 Lister Avenue, are less contaminated than the central to northwestern portions of OU1; the area to the east of Areas A and B, located at 120 Lister Avenue, is also characterized by contaminated soil, but to a lesser degree than that at 80 Lister Avenue.

Groundwater

Groundwater contaminants of concern (COCs) within the fill unit beneath OU1 includes 2,3,7,8- TCDD, VOCs, and metals.

Based on the results of the most recent groundwater sampling event from December 2023, primary groundwater COCs within the fill unit beneath the OU1 cap and inside the containment features (slurry walls and floodwall) consist of VOCs (benzene, hexachlorobenzene, toluene, chlorobenzene [CB], 1,4-dichlorobenzene [1,4-DCB], 1,2,4-trichlorobenzene [1,2,4-TCB], and trichloroethene [TCE]), metals (antimony, arsenic, lead, and mercury), and 2,3,7,8-TCDD. Site-related COCs (i.e., VOCs and 2,3,7,8-TCDD) also occur in the fill outside the area contained by the slurry wall. Detected concentrations ranged up to 3,830 micrograms per liter (ug/L) for benzene; 2,790 ug/L for toluene; 58,800 ug/L for CB; 452 ug/L for arsenic; and 44,000 picograms per liter for 2,3,7,8-TCDD.

WHAT IS A "PRINCIPAL THREAT"?

The National Oil and Hazardous Substances Pollution Contingency Plan (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 ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic and/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.

The slurry wall was installed as close to the OU1 boundary as practicable given constructability limitations at the time. This resulted in roughly 10 to 15 feet of fill material, on average, surrounding the WMA not being included in the interim remedy. While COCs measured in the fill outside of the slurry walls may be due, in part, to past releases from the historic Site operations, in the case of VOCs, there are indications that many of these same VOCs are comingled with upgradient off-Site sources as well. In general, concentrations of COCs in groundwater in fill wells outside the slurry wall/floodwall boundary are stable or decreasing and EPA expects optimization of the interim remedy to improve the groundwater conditions because it will further prevent migration of contaminants from the WMA.

Any impacts from fill material outside the slurry wall to the deeper aquifer will be evaluated as part of a future OU. Residual contaminated fill material that remains outside the slurry wall is covered by the cap, which extends beyond the slurry wall to the OU1 boundary and is therefore not available for exposure.

Dense Non-Aqueous Phase Liquid (DNAPL)

As part of OCC's ongoing operation and maintenance of the groundwater remedy at OU1, high-viscosity DNAPL has been observed in two groundwater extraction wells (EWs), EW-2 and EW-4, which are located along the floodwall in the northwestern and north-central portions of OU1. Trace, unrecoverable amounts of DNAPL are routinely observed in EW-2 during monthly gauging of the OU1 monitoring wells and EWs. DNAPL is generally present in measurable and recoverable amounts in EW-4. A few gallons of DNAPL are removed from EW-4 every year during one or two targeted removal events. Although EPA has concluded that this DNAPL likely originated from former activities at OU1, its specific source or sources are unknown.

Principal Threat Waste

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (40 CFR § 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. Source material 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. Principal threat wastes are 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. Contaminated groundwater is generally not considered to be source material. Please refer to the text box "What is a Principal Threat" for more information on the principal threat concept.

The investigations conducted at OU1 have documented highly elevated concentrations of contaminants in multiple media. Based on the toxicity and mobility characteristics described above, the following source materials present at OU1 are considered principal threat wastes:

- Free product DNAPL in groundwater based on its potential for mobility.
- Soil occurring below the water table containing hexachlorobenzene at concentrations greater than its 10^{-3} toxicity-based risk threshold (430,000 µg/kg) based on its potential for mobility and toxicity.
- Soil occurring below the water table containing 4,4'-DDT at concentrations greater than its 10^{-3} toxicity-based risk threshold (1,900,000 µg/kg) when in the presence of DNAPL based on its potential for mobility and toxicity.
- Soil occurring below the water table containing 2,3,7,8-TCDD in the presence of DNAPL based on its potential for mobility.

SCOPE AND ROLE OF ACTION

This is the final planned action for OU1, and will address soils, remediation waste, building demolition debris and other wastes placed in Areas A and B; the underlying and surrounding contaminated soils; and groundwater in the fill material above the organic silt layer that are contaminated with DDT, 2,3,7,8-TCDD and other COCs. The primary COCs in Site soils are 2,3,7,8-TCDD, and DDT. (The 1985 Site Evaluation Reports for 80 and 120 Lister Avenue document the full extent of contaminants detected at those properties.) These chemicals were released during the manufacturing operations of the former Diamond Alkali facility.

Erosion and transport of contaminated soils from the former Diamond Alkali facility via storm run-off and transport as fugitive dust was controlled initially by the placement of a geotextile over 80-120 Lister Avenue properties and later by the construction of the OU1 cap system for the Interim Remedy in 2000-2004. Migration of contaminated groundwater was controlled by the construction of the floodwall and slurry walls and the operation of the GWWS and GWTS intended to maintain hydraulic control and encourage inward and upward gradients across the slurry walls and organic silt layer, respectively.

Although the construction of the interim remedy prevented direct contact exposures to contaminated soil and dust and reduced the discharge of contaminated groundwater to the Lower Passaic River and to the underlying glaciofluvial sands, a significant volume of contaminated soil and debris remains below the cap system at OU1 and must be managed and monitored in perpetuity. The Site contaminants are persistent and do not degrade readily under most conditions. Given these conditions, it is necessary for EPA to select an appropriate final remedial alternative for OU1.

The Diamond Alkali Superfund Site includes three additional OUs: OU2, which consists of the lower 8.3 miles of the Lower Passaic River, and for which the remedial design was recently completed; OU3, which consists of the Newark Bay Study Area, and which is currently in the feasibility study stage; and OU4, which consists of the entire 17 miles of the Lower Passaic River and which is in the remedial design stage. Deep groundwater below the organic silt layer at OU1 may be addressed as part of a future OU.

SUMMARY OF SITE RISKS

The results of the site investigations completed in the 1980s for 80-120 Lister Avenue indicated that OU1 was contaminated by a large number of hazardous substances including dioxin, SVOCs, VOCs, herbicides, pesticides, and metals. The contamination was widespread and affected most media, including soils, groundwater, air, surface water and building structures.

The chemicals that were determined to present the greatest risks at OU1 due to their toxicities and concentrations were 2,3,7,8-TCDD and DDT, based on exposure to contaminated groundwater. The greatest potential for human exposure to 2,3,7,8-TCDD was identified as direct contact with surface soils and the risk assessment recommended that this exposure pathway be controlled. Other routes of exposure to the hazardous substances included migration of hazardous substances to the Lower Passaic River, migration of hazardous substances to groundwater, and migration of airborne hazardous substances.

A quantitative evaluation of direct risks to on-site workers was not performed since these risks were controlled by the initial response actions that had already been taken. The total excess cancer risks from exposure to groundwater were quantified for 2,3,7,8-TCDD (9.5×10^{-5} to 8×10^{-3}) and DDT (6.5×10^{-5} to 8.8×10^{-4}) and the total combined risks exceeded the risk range of 10^{-4} to 10^{-6} (one in ten thousand to one in one million) identified in the NCP.

Contaminants of Concern

Seventy chemicals were identified in soil and groundwater at the site during the investigation. From this list, a group of 15 chemicals was selected to be representative of the larger group, to facilitate the development of the risk assessment. These 15 representative COCs were selected based on factors such as toxicity and physical and chemical properties. The 15 representative COCs examined in the risk assessment were: arsenic, benzene, benzo(a)anthracene, bis(2-ethylhexyl)phthalate, β-BHC (Lindane), chloroform, cyanide, 2,4-dimethylphenol, DDT, 2,3,7,8-TCDD, hexachlorobenzene, 2-hexanone, phenol, 2,4,5-T, and 2,4,6-trichlorophenol (TCP).

Ecological Risk Assessment

A screening-level ecological risk assessment was not conducted as part of the remedy selection leading to the 1987 ROD. The Lister Avenue properties and surrounding areas consist of industrial properties. The industrial nature of OU1 and surrounding properties significantly limits the amount of available ecological habitat and influences the quality of that habitat. Further, EPA and NJDEP concluded that remediation of OU1 was likely to remove or alter any potential existing ecological resources. Given that the primary terrestrial ecological issue is contaminated surface soil, no ecological risk evaluation was required, since the remedial alternatives that were evaluated to address the human health risk would also address the soils likely to contribute to ecological risk and be protective of potential ecological receptors. Ecological risks from contaminated media in the Lower Passaic River are evaluated under different OUs. Control of migration of contaminated soil and groundwater from OU1 is necessary to ensure ecological risks in the Lower Passaic River are mitigated.

Summary of Risk Assessments

Construction of the Interim Remedy has eliminated, to the extent practicable, potential exposure to on-site soils and contaminant releases from buildings and structures. Further, treated groundwater is monitored to ensure that it meets current surface water discharge requirements, which are protective of ecological receptors, prior to being discharged into the Lower Passaic River. However, material within the containment cell represents principal threat waste and would pose significant risk should exposure occur.

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

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards such as ARARs, to-be-considered (TBC) advisories, criteria and guidance, and site-specific risk-based levels. The primary objective of any remedial strategy is overall protectiveness.

Based on the human health risk assessment findings, DDT and 2,3,7,8-TCDD contamination in soil and groundwater would pose an unacceptable risk through direct contact and ingestion of groundwater if these exposure pathways had not been mitigated by the interim remedy. The 1987 ROD contemplated that the risks would further be addressed by additional remedial actions in the future. Therefore, the RAOs described below were developed for a final remedy to address the human health and possible ecological risks posed by DDT- and 2,3,7,8-TCDD contaminated soil and debris at OU1.

Soil RAO:

- Prevent exposure (via ingestion, dermal contact, and inhalation) of human receptors (onsite and offsite commercial/industrial workers, construction/utility workers, and trespassers) to contaminated soil at concentrations exceeding remedial goals within the waste management area.

Groundwater RAOs:

- Prevent exposure (via ingestion, dermal contact, and inhalation) to Site-related contaminants in groundwater in the waste management area at concentrations greater than the applicable federal and state standards.
- Prevent the migration of Site-related DNAPL beyond the point of compliance (POC).
- Prevent the migration of Site-related contamination in groundwater that exceeds the applicable federal and state standards beyond the POC.

Preliminary Remediation Goals

To achieve the RAOs, EPA has selected preliminary remediation goals (PRGs) for OU1 COCs in soils and groundwater within the fill unit. PRGs are generally chemical-specific remediation goals for each medium and/or exposure route that are established to protect human health and the environment. They can be derived from ARARs, risk-based levels (human health and ecological), and from comparison to background concentrations, where appropriate.

For OU1, the groundwater PRGs are the New Jersey Groundwater Quality Standards for Class II-A aquifers, with consideration of national primary maximum contaminant levels (MCLs) for the Site-related contaminants in groundwater in the WMA. The PRGs for soil are the Non-residential New Jersey Soil Remediation Standards for the Ingestion-Dermal Pathway identified in N.J.A.C. 7:26D, Appendix 1 for hexachlorobenzene, 2,3,7,8-TCDD and 4,4'-DDT, which are the soil contaminants that are present at concentrations considered to be PTW.

COC Name	PRG
Soil[1] – units in mg/kg	
2,3,7,8-TCDD	0.00081
4,4'-DDT	9.5
Hexachlorobenzene	2.3
Fill Unit Groundwater – units in μg/L	
2,3,7,8-TCDD	0.00001
4,4'-DDT	0.1
Antimony (Total)	6
Benzene	1
Chlorobenzene	50
1,2-Dichlorobenzene (ortho)	600
1,3- Dichlorobenzene (meta)	600
1,4-Dichlorobenzene (para)	75
1,2,4- Trichlorobenzene	9
1,2-Dichloroethane	2
1,2-Dichloroethylene (cis)	70
Hexachlorobenzene	0.02
Toluene	600
Trichloroethylene	1
Vinyl Chloride	1
Arsenic (Total)	3
Lead (Total)	5
Mercury (Total)	2

1: Ingestion-dermal pathway value

Waste Management Area/POC

The NCP preamble language sets forth the EPA's policy that, for groundwater, "remediation levels generally should be attained throughout the contaminant plume, or at and beyond the edge of the waste management area when waste is left in place." The NCP preamble also indicates that, in certain situations, it may be appropriate to address the contamination as one waste management area (WMA) for purposes of the groundwater point-of-compliance (POC). The POC for meeting ARARs is defined by the outside faces of the slurry walls, the riverside face of the floodwall located between the OU1 properties and the Lower Passaic River, and the bottom of the naturally occurring organic silt deposit that underlies 80-120 Lister Avenue. The material within the WMA includes contaminated soil, stabilized drum and tank contents, debris from the demolition of structures, disassembled shipping containers, asbestos-containing material, and phosphorous-containing material which had been allowed to react with the atmosphere before placement in a vault.

The POC is shown on Figure 2 at the end of the Proposed Plan, identified by the blue line that represents the slurry wall.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA Requirements

Section 121(b)(1) of CERCLA, 42 U.S.C. § 9621(b)(1), requires that remedial actions must be protective of human health and the environment, be cost-effective, and use permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. CERCLA Section 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 that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4). Detailed information about the remedial alternatives is provided in the 2024 *Feasibility Study Report*.

Alternatives Screening

The 2024 *Feasibility Study Report* assembled and screened eight alternatives for potential remediation of OU1. Several site-wide alternatives (3, 5, and 7) were not retained for further evaluation due to the challenges associated with attempting to excavate or treat in-situ the contaminated soil adjacent to the floodwall. At this location, the contaminated soils are located below the tiebacks and anchors that support the floodwall. Site-wide excavation and off-site disposal, site-wide in-situ stabilization (ISS) and site-wide in-situ thermal treatment are each too challenging to implement due to the difficulties of working in and around the tie-rods and anchors associated with the floodwall constructed at the northern boundary of OU1, adjacent to the Lower Passaic River and the associated expense.

When the floodwall was constructed between June and December 2000, the tie-rods were placed at approximately the pre-remedy ground surface, with little or no excavation. The anchors were excavated approximately 5 feet into the pre-remedy ground surface (FS Section 1.5.5, Construction of Floodwall, page 1-13). Additional anchors installed in 2012, intended to stabilize the wall during the Lower Passaic River Phase 1 Removal Action sediment dredging efforts, were drilled from the exterior of the floodwall approximately 85 feet into the OU1 properties at a downward angle of approximately 31.5 degrees, within grouted boreholes to protect against migration of contaminants through the organic silt layer that underlies the waste. According to Section 1.6.4.2 of the 2024 FS Report, Impacted Materials Placed Beneath the Cap, the present-day areas of highest COC concentrations are the soils and fill located beneath/between the floodwall anchorage structures and below the central portion of OU1, where contaminated materials were intentionally placed beneath the Interim Remedy cap system in Areas A and B.

The alternatives retained for the detailed comparative evaluation (Alternatives 1, 2, 4, 6 and 8) do not include the need to access contaminated soils beneath the tiebacks and anchors and are therefore implementable and are described below.

The estimated costs for each remedial alternative to be comparatively evaluated are expressed as net present value, using a 7% discount rate. The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction. Annual operation and maintenance (O&M) costs are associated with routine maintenance, while periodic costs include the replacement of remedy components to maintain their long-term integrity and effectiveness.

Common Elements for Alternatives

Remedial alternatives 1, 2, 4, 6 and 8 each include institutional controls, maintenance of the OU1 cap, maintenance of the GWWS and GWTS, and long-term monitoring in perpetuity. The institutional controls (currently in place) consist of a deed restriction that allows for only industrial/commercial use of the property and a NJDEP Classification Exception Area/Well Restriction Area (CEA/WRA), an institutional control established under New Jersey law documenting an area where water quality standards cannot be met and which limits installation of groundwater extraction wells. Alternatives 2, 4, 6, and 8 each include similar upgrades to the GWWS and GWTS. All five alternatives leave waste on-site (due to the infeasibility of removing/treating waste beneath the tie backs and anchor structures of the floodwall) and therefore require maintenance of the cap and GWWS/GWTS and the preparation of five-year review reports to monitor ongoing remedy effectiveness. A 30-year cap maintenance period was used for cost-estimating purposes, but the cap would need to be maintained in perpetuity.

Alternative 1: No Further Action

Capital Cost	$0
Annual O&M Cost	$963.000
Total Present Value Cost	$12,000,000
Construction Time Frame	0 years

Regulations governing the Superfund program require that the "no action" alternative be evaluated to establish a baseline for comparison to other alternatives. Under this alternative, EPA would take no action to modify or enhance the existing interim remedy.

Alternative 1 consists of O&M of the current Interim Remedy, including the low permeability cap and stormwater management system, floodwall, slurry walls, GWWS for hydraulic containment, GWTS with discharge of treated groundwater to the Lower Passaic River, DNAPL recovery as needed, ongoing groundwater monitoring, perimeter fence, and security controls. Given the site conditions and the existing Interim Remedy, EPA replaced the typical 'No Action' Alternative (required under CERCLA) with this 'No Further Action' Alternative.

Alternative 2: Optimized Containment Remedy

Capital Cost	$3,640,000
Annual O&M Cost	$ 963,000
Total Present Value Cost	$16,000,000
Construction Time Frame	1 year

Alternative 2 is a modification of Alternative 1, the Interim Remedy that is currently operating at OU1, in that it adds several optimizations to the current Interim Remedy to improve its effectiveness. In addition to the optimizations summarized below, all other components of Alternative 1 would be retained, operated, and maintained. The optimizations consist of:

- Replacement of extraction wells EW-1 through EW-6, located along the floodwall, to locate their screened intervals more accurately in the fill layer beneath the cap. In addition, variable speed pumps will be provided to replace the constant head pumps.
- Reactivation of extraction well EW-9 on the south side of OU1 to enhance the hydraulic capture of the system across OU1 and reduce the potential for downward migration of COCs to the underlying glaciofluvial sands.
- Redesign and replacement of portions of the groundwater conveyance system, as needed.
- Upgrade of the GWTS, as needed to improve metals removal and meet discharge requirements, along with optimization based on groundwater modeling to improve hydraulic containment.
- Investigation of the integrity of the existing impermeable cap layer via a site-wide electrical resistivity survey and subsequent repairs, if needed.
- Installation of additional groundwater monitoring wells, if needed.
- DNAPL removal as needed.
- O&M of engineering controls for an indeterminate period.

Based on groundwater modeling results, the optimization measures to the GWWS as described in Alternative 2 would improve hydraulic containment. Extracting groundwater from the fill layer only (as opposed to from fill and glaciofluvial sand as it occurs currently) would achieve consistent upward hydraulic gradients in the northern third of the Site where the current Interim Remedy does not consistently maintain an inward gradient. The groundwater conveyance system and GWTS would be upgraded or redesigned as needed to accommodate any additional flow and influent contaminant concentrations.

Alternative 4: Targeted Excavation with Off-site Disposal, Backfill with Imported Fill, Capping, and Containment

Capital Cost	$119,000,000
Annual O&M Cost	$ 963,000
Total Present Value Cost	$132,000,000
Construction Time Frame	3 years

Alternative 4 would require the opening of the OU1 cap and the targeted excavation of contaminated fill materials from above the organic silt layer. Targeted excavation would be designed to avoid the location of the tiebacks and anchor structures for the floodwall, where excavation is not feasible. Alternative 4 would remove about 69,000 cy of waste (more than 50 percent) from the central/southern portion of OU1, where it is difficult to consistently maintain upward hydraulic gradients, followed by off-site disposal of the waste. Although the material to be excavated has not been classified for disposal, it is anticipated that based on the history of the Site and the type of COCs present in the media, they would most likely be F-listed waste. In addition, a significant portion of the impacted media volume is impacted with COC concentrations in excess of the (universal treatment standards) UTSs. Disposal options for excavated impacted media would likely be limited to a potential disposal facility in Canada.

The slurry walls and floodwall would be retained. After backfilling the excavation with clean imported fill, the cap would be restored over the work area and the GWWS and GWTS would be replaced/reactivated and optimized, including the re-installation of the six extraction wells located along the floodwall and the reactivation of EW-9, as described in Alternative 2. The GWTS would be modified with the addition of ion exchange treatment.

O&M of site controls would continue for an indeterminate period along with DNAPL removal as needed.

Alternative 6: Targeted ISS, Capping, and Containment

Capital Cost	$34,290,000
Annual O&M Cost	$ 963,000
Total Present Value Cost	$47,000,000
Construction Time Frame	3 years

Alternative 6 would require the opening of the OU1 cap to allow for the use of bucket mixing to introduce stabilizing agents, such as Portland cement, into a 10 to 22 foot below ground surface (bgs) mixing zone, to reduce the potential for migration of COCs away from OU1. A laboratory study would need to be performed prior to full-scale ISS implementation to assess whether an effective ISS mixture could be achieved.

The intent of Alternative 6 is to stabilize approximately 69,000 cy of contaminated soil and waste located above the organic silt layer in the central and southern portions of OU1, away from the sensitive infrastructure of the floodwall. Large debris encountered in the subsurface would require excavation and disposal off-site. Due to swell volumes, some of the stabilized waste may require off-site disposal at one of the identified facilities in Canada that could accept the waste.

Following completion of the ISS effort, the cap would be reconstructed/replaced above the stabilized waste and the monitoring well network re-established. The slurry walls and floodwall would be retained. The GWWS and GWTS would be replaced/reactivated and optimized, including the re-installation of the six extraction wells located along the floodwall. O&M of site controls would continue for an indeterminate period, along with DNAPL removal as needed, to further reduce the potential for mass transport of COCs from remaining impacted media located near the floodwall infrastructure that are not subjected to stabilization.

Alternative 8: Targeted Excavation with Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment

Capital Cost	$53,640,000
Annual O&M Cost	$ 963,000
Total Present Value Cost	$66,000,000
Construction Time Frame	3 years

Alternative 8 would also employ targeted excavation of contaminated fill materials from above the organic silt layer. Similar to Alternative 4, the targeted excavation would be designed to avoid the location of the tiebacks and anchor structures for the floodwall, removing about 69,000 cy of waste from the central/southern portion of OU1. The excavated waste would be subjected to on-site, ex-situ thermal treatment and the treated media would be returned to the excavation. The ex-situ thermal treatment would be designed such that the treated media would comply with the LDRs in 40 CFR 268 Subpart C. Laboratory and/or pilot studies may be required to establish the details of the treatment design. Some excavated materials not amenable to ex-situ thermal treatment, such as large debris items and phosphorus-contaminated soil, would be disposed of off-site.

The slurry walls and floodwall would be retained. After backfilling the excavation with the treated media, the cap would be restored over the work area and the GWWS and GWTS would be replaced/reactivated and optimized, including the re-installation of the six extraction wells located along the floodwall and the reactivation of EW-9. The GWTS would be modified with the addition of ion exchange treatment.

O&M of site controls would continue for an indeterminate period along with DNAPL removal as needed to further reduce the potential for mass transport of COCs from remaining impacted media located outside the thermal treatment area.

EVALUATION OF ALTERNATIVES

The NCP identifies nine criteria that EPA uses to evaluate the remedial alternatives individually and against each other in order 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. The nine evaluation criteria are discussed below. A detailed analysis of alternatives can be found in the 2024 FS Report, all the alternatives considered would be protective of human health and the environment.

Threshold Criteria

1. Overall Protection of Human Health and the Environment

A primary requirement of CERCLA is that the selected remedial alternative be protective of human health and the environment. An alternative is protective if it reduces current and potential future risks associated with each exposure pathway at a site to acceptable levels.

Alternative 1 (No Further Action) is protective of human health and the environment. The existing Interim Remedy cap prevents contact with OU1 wastes and the slurry walls, floodwall, GWWS, and GWTS mitigate the spread of groundwater contamination by reducing potential discharge to the Lower Passaic River and migration into the underlying sand aquifer. While inward gradients have generally been established, upward hydraulic gradients are not being and will not be fully achieved in significant portions of OU1 due to a number of issues, including the construction of a number of the existing extraction wells (which are not screened at an optimal stratum/depth).

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
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.
Compliance with ARARs evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that are legally applicable, or relevant and appropriate to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
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.
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.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
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.
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.
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.

Alternative 2 (Optimized Containment Remedy) is protective of human health and the environment. As with the Alternative 1 (No Further Action), the maintained cap will prevent contact with site wastes and the slurry walls, floodwall, GWWS and GWTS mitigate the spread of groundwater contamination by reducing potential discharge to the Lower Passaic River and migration into the underlying sand aquifer. In the case of Alternative 2, the inward gradients would be maintained, and the upward hydraulic gradients are expected to be improved due to the extraction well re-installations, the reactivation of EW-9 and other improvements to the GWWS. Groundwater modeling suggests that Alternative 2 would achieve consistent upward hydraulic gradients in throughout OU1. EPA anticipates that the remainder of the groundwater would ultimately be captured as it flows northward to the line of extraction wells near the floodwall (Section 8.1.2, Alternative 2 – Optimized Current Remedy (Optimized Capping and Containment), page 8-3).

Alternative 4 (Targeted Excavation with Off-Site Disposal, Backfill with Imported Fill, Capping, and Containment) is protective. A portion of the impacted materials (more than 50 percent) would be removed from OU1 and transported to a secure disposal facility. Further, the excavation boundaries would correspond with locations where it is difficult for the current GWWS to consistently maintain upward hydraulic gradients.

Alternative 6 (Targeted ISS, Capping, and Containment) is protective of human health and the environment. A portion of the impacted materials would be treated via ISS to mitigate migration of the COCs (though comparatively highly-contaminated material would still remain in place and untreated below the floodwall tie-rods and anchors in the northern portion of OU1). ISS would be implemented at locations where it is difficult for the current GWWS to consistently maintain upward hydraulic gradients.

Alternative 8 (Targeted Excavation with Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment) is protective in that a similar quantity of contaminated materials would be removed and treated ex-situ to reduce the concentration of COCs prior to the placement of treated media back into the on-site excavation as under Alternatives 4 and 6. Consistent with Alternatives 2, 4 and 6, an optimized GWWS, GWTS, and cap system would be retained to remediate contaminated material outside the targeted excavation and treatment area.

2. Compliance with ARARs

The 1987 ROD and the 1990 consent decree documented that the basis for EPA's waiver of several provisions of RCRA that were identified as action-specific ARARs, concerning BDAT, LDRs and landfill requirements pertaining to bottom liners and leachate collection systems, based on the greater risk anticipated with attempted excavation of the waste for treatment or off-site disposal. Under Section 121(d)(4)(B) of CERCLA, EPA may select a remedy that does not comply with particular ARARs if compliance with such requirements would result in greater risk to human health and the environment than alternative options. In the 1987 ROD and Responsiveness Summary, EPA based its waiver of the RCRA requirements on the significant additional risks associated with excavation of the hazardous substances at OU1, including the risk resulting from airborne releases. EPA also referred to the interim nature of the remedy in the Responsiveness Summary, noting that "[t]here are no commercial facilities, either currently or in the near future, available for the treatment or disposal of dioxin-contaminated wastes." For those reasons, in 1987 EPA concluded that the only viable alternative available was to secure and contain all contaminated materials on site until an appropriate technology became available, and that the remedy could be supplemented by additional actions in the future, if feasible.

Alternative 1 (No Further Action), Alternative 2 (Optimized Containment Remedy) and Alternative 6 (Targeted ISS, Capping, and Containment) would require the same ARAR waivers as the 1987 ROD, specifically waiver of BDAT and LDR before placement of waste (40 CFR Part 268, Subparts D and C, respectively) and standards for landfill design (40 CFR Part 264, Subpart N). Alternative 8 (Targeted Excavation and Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment) would treat impacted media in the targeted excavation area to concentrations below the standards specified in the LDRs. Alternatives 4 and 8 would still require waivers from the landfill design standards due to the fact that impacted media outside the targeted excavation area would remain on-site and untreated. All other ARARs would be met by the alternatives.

A waiver of the RCRA provisions cited above would be justified under Section 121(d)(4)(B), as in 1987. The basis for waiving the requirements would be to avoid the construction-related exposure risks associated with excavation of the dioxin-contaminated soils and wastes, due to the elevated on-site concentrations and significant toxicity of dioxin. Excavating the waste for off-site disposal would entail transport of contaminated soil and there would be a risk of a transportation incident. Conducting ex-situ thermal treatment would require on-site handling of contaminated soil for an extended period, prior to replacement of treated soil on-site. While EPA would require state-of-the-art controls to reduce the potential for exposure to contaminants during remedial construction, the Ironbound is a densely populated area of Newark, NJ, and exposure risks must be considered while evaluating the potential effectiveness of Alternatives 4, 6, and 8. In addition, even with the removal and treatment opportunities afforded by these alternatives, highly contaminated waste would still remain on-site beneath the floodwall tiebacks and anchors.

Balancing Criteria

3. Long-Term Effectiveness and Permanence

This evaluation takes into account the residual risk remaining at the conclusion of remedial activities, the adequacy and reliability of containment systems and institutional controls, and climate change.

All five of the alternatives rely on the existing GWTS building, which was designed to sustain wind speeds comparable to a Category 2 Hurricane. Although storm intensity is expected to increase because of climate change, EPA assumes that current building codes are sufficient to address future vulnerabilities due to wind. The existing remedy, specifically the groundwater pump and treat remedy and associated infrastructure, has withstood the impacts of three tropical storms since 2012 (Superstorm Sandy in October 2012, Hurricane Henri in August 2021, and Hurricane Ida in September 2021), all of which resulted in significant rainfall at the Site. Alternatives include plans to develop a severe weather preparedness plan that includes a portable temporary treatment system that would be used in the event that the groundwater pump and treat system would need repairs. Changes in building codes resulting from climate change-related predictions can be accommodated with building improvements since the interior of the building is open construction. While most storm scenarios considered in the 2024 FS Report did not result in flooding at OU1, the cap system can withstand inundation. Upon cessation of storm surge, the sloped cap would shed water as the floodwaters receded. Storm surge is also expected to temporarily increase groundwater elevations in the fill and underlying sand, while the cap would limit the volume of water from entering the fill within the slurry wall/floodwall boundary, effectively minimizing any impact to the water within the WMA. This would enhance the inward and upward gradients across the organic silt layer and slurry wall during the storm surge.

Alternative 1 (No Further Action) and Alternative 2 (Optimized Containment Remedy) both provide long term protection of human health and the environment. Ongoing O&M activities of the cap, GWWS, and GWTS help maintain the protectiveness by preventing contact with the waste and reducing the migration of groundwater contamination. Alternative 2 has several advantages over Alternative 1 with regard to containing groundwater contamination, as described in the Summary of Remedial Alternatives, such as the reinstalled and reactivated extraction wells.

The long-term effectiveness and permanence of Alternative 4 (Targeted Excavation with Off-Site Disposal, Backfill with Imported Fill, Capping, and Containment) is superior to that offered by Alternative 2 because a significant portion of the contaminated material would be removed from OU1 and disposed at an appropriate facility. Replacement and ongoing O&M of the impermeable cap, GWWS, and GWTS would yield an equivalent level of protection to Alternative 2 for the risk of exposure to the waste that would remain on-site.

The long-term effectiveness and permanence of Alternative 6 (Targeted ISS, Capping, and Containment) is superior to Alternative 2 because a significant portion of the highly contaminated material would be treated via ISS in a portion of OU1that is not well-addressed by the current GWWS. Replacement and ongoing O&M of the cap, GWWS, and GWTS would yield an equivalent level of protection to Alternative 2 for the risk of exposure to the waste remaining untreated in the northern portion of OU1.

Alternative 8 (Targeted Excavation with Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment) provides similar long-term effectiveness and permanence to Alternatives 4 and 6 because it would include excavation and treatment of a significant portion of the contaminated material prior to replacing it on-site, as well as replacing and maintaining the cap, GWWS, and GWTS.

4. Reduction of Toxicity, Mobility, and Volume through Treatment

This criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and/or significantly reduce the toxicity, mobility or volume of hazardous substances as their principal element.

Under Alternative 1 (No Further Action) and for Alternative 2 (Optimized Containment Remedy), hydraulic control would reduce mobility, toxicity, and volume of groundwater contaminants. They would also continue to control the mobility of contaminated soil. Alternative 2 would provide greater reduction of toxicity, mobility, or volume through treatment than Alternative 1 because it includes the reinstallation of extraction wells along the floodwall. The optimized GWWS and GWTS would continually remove contaminant mass from the Site (about 1,000 pounds (lbs) of SVOCs, herbicides, and VOCs per year).

Under Alternative 4 (Targeted Excavation with Off-Site Disposal, Backfill with Imported Fill, Capping, and Containment), the volume of COCs at OU1 would be reduced via removal, and if the excavated waste is treated prior to land disposal at one of the Canadian waste disposal facilities (though it is not known if pre-treatment would be required) additional reduction of mobility, toxicity, and volume of the waste could be achieved. Ongoing hydraulic control would also reduce the mobility of groundwater contaminants. The optimized GWWS and GWTS would continually remove contaminant mass from the Site (about 1,000 lbs of SVOCs, herbicides and VOCs per year).

Under Alternative 6 (Targeted ISS, Capping, and Containment), the mobility of soil COCs would be reduced via ISS treatment in the central and southern areas of OU1. Ongoing hydraulic control would also reduce the mobility of groundwater contaminants. The optimized GWWS and GWTS would continually remove contaminant mass from OU1 (about 1,000 lbs of SVOCs, herbicides and VOCs per year).

Alternative 8 (Targeted Excavation with Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment) would provide a significant reduction in volume, mobility and toxicity by treating excavated waste with ex-situ thermal technology. Similar to Alternatives 2, 4, and 6, it would also continue to remove contaminant mass via the GWWS and GWTS.

5. Short-Term Effectiveness

This criterion addresses the effects of each alternative during construction and implementation until RAOs are met. It considers risks to the community, on-site workers and the environment, available mitigation measures and time frame for achieving the response objectives.

No short-term impacts are associated with Alternative 1 (No Further Action) since no construction is required to continue to operate and maintain the existing Interim Remedy systems. For Alternative 2 (Optimized Containment Remedy), minor short-term impacts would be associated with the re-installation of the extraction wells; however, the construction timeframe is short, and the work is generally routine. More extensive construction may be required depending on potential changes to the GWWS and the need to repair the impermeable cap (based on the findings of the resistivity survey).

For Alternative 4 (Targeted Excavation with Off-Site Disposal, Backfill with Imported Fill, Capping, and Containment), high short-term exposure and safety risks would be created during the handling and transportation of a significant volume of contaminated waste to be excavated from OU1. Traffic and air quality impacts could be significant and would require special mitigation measures. The high toxicity of the waste and debris to be excavated, the challenges with managing these wastes and materials in such a densely populated area, and the heterogeneity of the placement of waste and materials in the containment cell would all significantly contribute to the short-term risks associated with an effort to remove contaminated soil and debris from the containment cell.

Under Alternative 6 (Targeted ISS, Capping, and Containment), comparatively high short-term exposure and safety risks would be created during the disturbance of a significant volume of contaminated waste to be uncovered and mixed with ISS agents. Air quality impacts could be significant and would require special mitigation measures. Although large debris items would require off-site disposal, the transportation risks would be less than those associated with Alternative 4.

Alternative 8 (Targeted Excavation with Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment) would entail lower short-term exposure and safety risks than Alternative 4, because although the same volume of waste would be excavated, Alternative 8 would treat the waste on-site and a much smaller amount of waste (large debris items and phosphorus-contaminated soil) would require transportation and off-site disposal.

6. Implementability

This criterion considers the technical and administrative feasibility of implementing each alternative, including availability of services and materials needed during construction.

Alternative 1 (No Further Action) is proven to be implementable since it is a continuation of the existing Interim Remedy. Alternative 2 (Optimized Containment Remedy) is readily implementable since it is a continuation of the existing Interim Remedy with upgrades that can be constructed and maintained with commonly available, standard techniques.

Under Alternative 4 (Targeted Excavation with Off-Site Disposal, Backfill with Imported Fill, Capping, and Containment), a significant shoring and construction dewatering effort would be required during removal of the contaminated soil, given the depth of the planned excavation. Continuous dewatering and water treatment would exceed the capacity of the existing GWTS, requiring alternative treatment to be provided. The logistical and permitting challenges associated with transporting a significant volume of waste to Canada would need to be managed and are expected to be complex. The components of Alternative 4 that are common with Alternative 2 (replacing extraction wells, O&M of the GWWS and GWTS, O&M of the cap system) can be constructed/maintained with commonly available, standard techniques. During remedy construction, the phosphorous-containing material within Area A was allowed to react with the atmosphere prior to placement in pit, compaction, and encapsulation using clay. Excavation and disposal of the material would require careful planning and execution, especially in an area with nearby residential populations but could be accomplished with standard equipment.

Implementation of Alternative 6 (Targeted ISS, Capping, and Containment) is technically feasible, although challenging. The major challenges are the existing subsurface structures and debris, size of the area to be stabilized, and potential for groundwater displacement. Optimization and continued operation of the capping and containment portion of this alternative is highly implementable. Compliance with the US and Canadian regulations would be required for transporting the debris not suitable for ISS for disposal. Like the buried debris, the phosphorous-containing material located in Area A is not suitable for ISS and would require excavation and disposal. This would require careful planning and execution especially in an area with nearby residential populations but could be accomplished with standard equipment. The full implementation of this alternative (regulatory approval, pre-design investigation, design, contractor procurement and construction) would require several years.

Implementation of Alternative 8 (Targeted Excavation with Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping, and Containment) would need to address the same shoring and construction dewatering challenges posed by Alternative 4; however, the logistical and permitting needs for the transportation and off-site disposal would be much more manageable due to a smaller volume of waste requiring off-site disposal. Laboratory and pilot studies may also be required for Alternative 8 to establish the details of the ex-situ treatment design. Apart from mercury, ex-situ thermal treatment does not address metals and these contaminants, already present in the historic fill that was placed in the 1800s to reclaim the OU1 property from the Lower Passaic River, will have to be controlled in perpetuity via the cap, slurry walls, floodwall, GWWS, and GWTS.

7. Cost

Cost estimates for the five alternatives are summarized in the table below. A discount rate of 7 percent was used to develop the net present value costs, consistent with EPA guidance.

Alternative	**Estimated Cost**
1. No Further Action	$12M
2. Optimized Containment Remedy	$16M
4. Targeted Excavation, Off-site Disposal, Backfill, Capping and Containment	$132M
6. Targeted ISS, Capping, and Containment	$47M
8. Targeted Excavation, Ex-Situ Thermal Treatment, Backfill of Treated Media, Capping and Containment	$66M

Modifying Criteria

8. State Acceptance
NJDEP concurs with EPA's preferred alternative.

9. Community Acceptance
Community acceptance of the preferred alternative will be evaluated after the public comment period ends. Comments received on the Proposed Plan during the comment period will be addressed in the Responsiveness Summary section of the ROD.

PREFERRED ALTERNATIVE

Based upon the comparative analysis of the remedial alternatives, EPA proposes Alternative 2, Optimized Containment, as the preferred alternative for a final remedy for OU1.

The preferred remedy for OU1 includes the following components:

- Replacement of extraction wells EW-1 through EW-6, located along the floodwall, to locate their screened intervals more accurately in the fill layer beneath the cap. In addition, variable speed pumps will be provided to replace the constant head pumps.
- Reactivation of extraction well EW-9 on the south side of OU1.
- Redesign and replacement of portions of the groundwater conveyance system, as needed.
- Upgrade of the GWTS, as needed.
- Investigation of the integrity of the existing impermeable cap layer via a Site-wide electrical resistivity survey and subsequent repairs, if needed.
- Installation of additional groundwater monitoring wells, if needed.
  Maintenance of the OU1 cap, maintenance of the GWWS and GWTS, and long-term monitoring in perpetuity
- ICs

Basis for the Remedy Preference
Based on the evaluation described above, remedial alternatives requiring significant excavation/disturbance of waste from the subsurface, whether for off-site disposal, ISS, or ex-situ thermal treatment, would result in significant short-term risks and implementability challenges due to the need to:
- Handle, transport, and potentially treat large volumes of highly contaminated soils (and, under Alternatives 6 and 8, the handling and off-site disposal of large debris items).
- Handle, treat, and discharge large volumes of excavation dewatering effluent that would exceed the capacity of the existing Interim Remedy GWTS and require an alternative dewatering effluent treatment system to be designed and provided (for Alternatives 4 and 8).
- Protect against releases of dust and vapors to the atmosphere that could cause exposures to workers and the surrounding community, either during excavation or in-situ soil mixing for ISS.
- Transport dioxin-contaminated waste to a Canadian waste disposal facility due to the lack of domestically-available capacity.

The "targeted" alternatives (Alternatives 4, 6, and 8) consist of removal and off-site disposal, ISS, or removal and ex-situ thermal treatment of soil in the central and southern areas of OU1 only, safely distant from the slurry walls and floodwall anchor structures. While Alternatives 4, 6 and 8 would provide greater long-term protectiveness and permanence than Alternatives 1 and 2, highly contaminated fill would still remain onsite/untreated below the floodwall anchor structures; therefore, these alternatives would require maintenance of the impermeable cap system, GWWS, and GWTS, Site monitoring and other features, for an indeterminate time. To varying degrees, the targeted alternatives still generate comparatively high short-term risks and implementation challenges (for example, excavation and off-site disposal of 69,000 cy of waste). The presence of significant quantities of large metal debris below the cap system in Areas A and B (e.g., the components of numerous shipping containers that were used to temporarily contain dioxin-contaminated waste prior to Interim Remedy construction and building demolition debris) also present a significant challenge to conducting soil mixing for ISS and ex-situ thermal treatment. In these cases, the cap system, parts of the GWWS, and monitoring system must also be temporarily removed to conduct the work and then reconstructed or repaired.

EPA's Preferred Alternative is Alternative 2, Optimized Containment Remedy. It meets the threshold criteria of protecting human health and the environment and compliance with ARARs, with a basis for waiver of specific ARARs as described. The Optimized Containment Remedy includes components intended to address the two primary concerns regarding the performance of the current Interim Remedy (Alternative 1), specifically that the current Interim Remedy doesn't consistently maintain inward and upward hydraulic gradients within the area enclosed by the floodwall and slurry walls and underlain by the native organic silt layer (the points of compliance for OU1) and that there may be a need for additional maintenance/repair of the cap system.

Alternative 2 avoids the short-term risks and implementability challenges associated with Alternatives 4, 6, and 8 (Targeted Excavation and Off-Site Disposal, Targeted ISS, and Targeted Excavation with Ex-Situ Thermal Treatment, respectively). The major components of Alternative 2 consist of reinstallation of six groundwater extraction wells, reactivation of an extraction well in the southern portion of OU1, associated upgrades to the GWWS and GWTS and site-wide investigations to check the condition and function of the cap system and make repairs, as appropriate.

EPA intends to invoke ARAR waivers under Section 121(d)(4)(B) of requirements pertaining to the placement of off-site remediation wastes in Areas A and B beneath the cap system, and construction of the containment cell, specifically, BDAT, LDRs and landfill requirements pertaining to bottom liners and leachate collection systems. The waivers would be consistent with the ARAR waivers documented in the 1987 ROD, specifically BDAT and LDR before placement of waste (40 CFR Part 268, Subparts D and C, respectively) and standards for landfill design (40 CFR Part 264, Subpart N).

As previously summarized, the basis for waiving the ARARs would be to avoid the construction-related exposure risks associated with excavation of the dioxin-contaminated soils and wastes, due to the elevated on-site concentrations and significant toxicity of dioxin and the potential for transportation incidents associated with off-site disposal alternatives.

COMMUNITY PARTICIPATION

EPA encourages the public to gain a more comprehensive understanding of OU1 of the Site and the Superfund activities that have been conducted there.

The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record files, are provided on the front page of this Proposed Plan. Written comments (either by mail or e-mail) on the Proposed Plan should be addressed to the Remedial Project Manager Eugenia Naranjo at the address noted in the text box.

For further information on OU1 of the Diamond Alkali Superfund Site, please contact:

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Drew Curtis
Community Involvement Coordinator
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curtis.malcolm@epa.gov

Written comments on this Proposed Plan should be submitted to Ms. Naranjo via mail or e-mail by October 10, 2024.

Eugenia Naranjo
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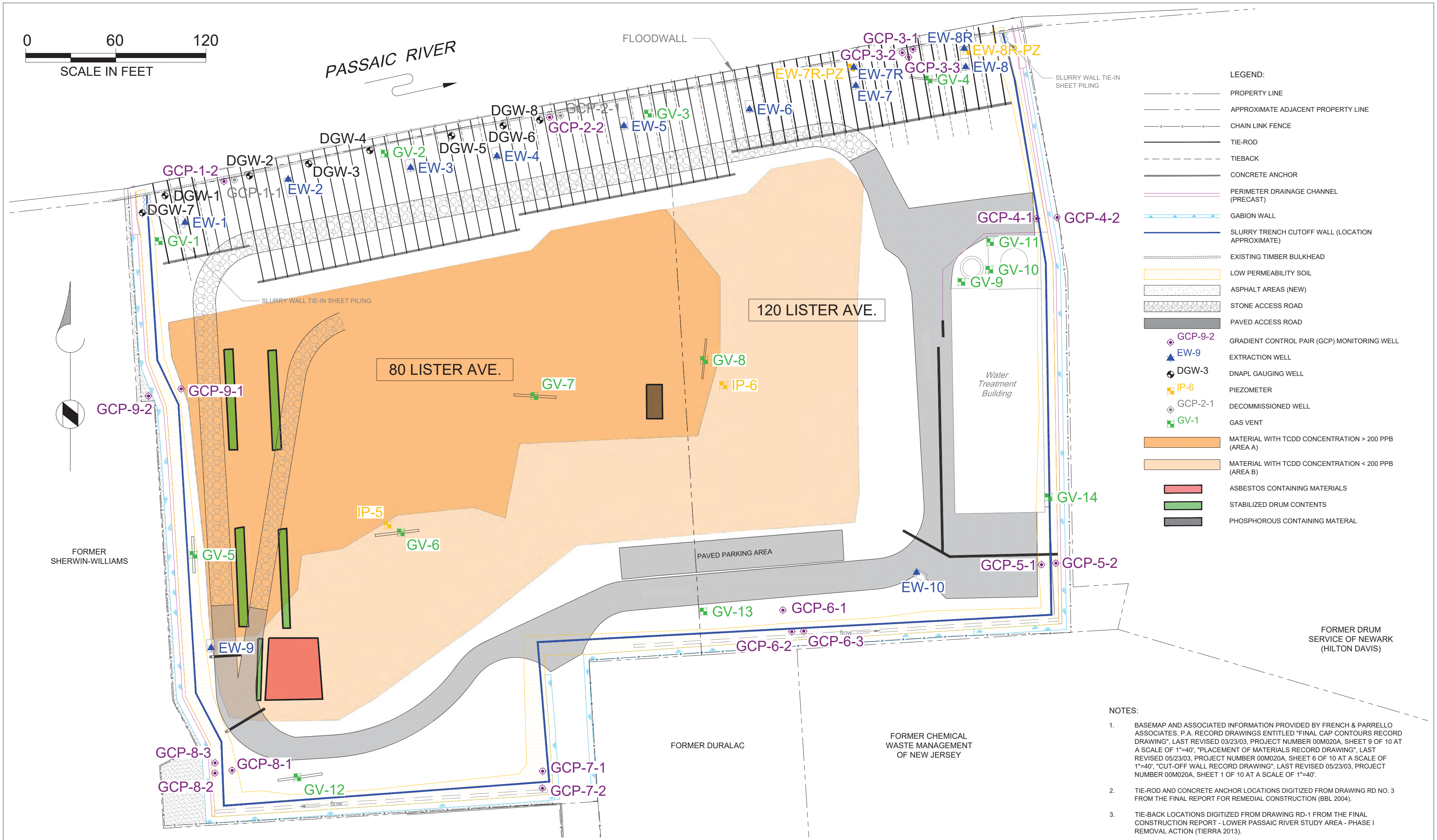
Naranjo.eugenia@epa.gov



NOTES:

1. BASEMAP AND ASSOCIATED INFORMATION PROVIDED BY FRENCH & PARRELLO ASSOCIATES, P.A. RECORD DRAWINGS ENTITLED "FINAL CAP CONTOURS RECORD DRAWING", LAST REVISED 03/23/03, PROJECT NUMBER 00M020A, SHEET 9 OF 10 AT A SCALE OF 1"=40', "PLACEMENT OF MATERIALS RECORD DRAWING", LAST REVISED 05/23/03, PROJECT NUMBER 00M020A, SHEET 6 OF 10 AT A SCALE OF 1"=40', "CUT-OFF WALL RECORD DRAWING", LAST REVISED 05/23/03, PROJECT NUMBER 00M020A, SHEET 1 OF 10 AT A SCALE OF 1"=40'.
2. TIE-ROD AND CONCRETE ANCHOR LOCATIONS DIGITIZED FROM DRAWING RD NO. 3 FROM THE FINAL REPORT FOR REMEDIAL CONSTRUCTION (BBL 2004).
3. TIE-BACK LOCATIONS DIGITIZED FROM DRAWING RD-1 FROM THE FINAL CONSTRUCTION REPORT - LOWER PASSAIC RIVER STUDY AREA - PHASE I REMOVAL ACTION (TIERRA 2013).

Brown AND Caldwell

SCALE: 1" = 60'
JOB NUMBER: 158044
DATE: March 5, 2024

DIAMOND ALKALI SUPERFUND SITE
80-120 LISTER AVENUE
NEWARK, ESSEX COUNTY, NEW JERSEY

IMPACTED MATERIAL EMPLACEMENT AND FLOODWALL ANCHORAGE STRUCTURES

FIGURE
2

Path: C:\bcpwi\d2605533 File Name: 2022_FS_BuriedImpactedMaterialEmplacement&FloodwallAnchorageStructures Plot Date: March 5, 2024 3:20 PM Cadd User: Richard Johnson