PROPOSED PLAN

FORMER RARITAN ARSENAL
DREDGE SPOIL AREAS 4 AND 6
FUDS PROJECT NO. CO2NJ008403
MIDDLESEX COUNTY, NEW JERSEY

Text in bold and underlined is the first mention of a word or phrase that is included in the glossary at the end of this Proposed Plan.

The Proposed Plan

This **Proposed Plan** addresses both **Munitions and Explosives of Concern** (MEC) and **Munitions Constituents** (MC) at DSA 4 and DSA 6. A No Action decision is proposed for MC soil and sediment contamination.

Because potential risks associated with MEC were identified, this Proposed Plan also identifies alternatives for addressing MEC at DSA 4 and 6.

Public Comments Are Requested

PUBLIC COMMENT PERIOD

December 8, 2025 through January 14, 2026

Written comments on this Proposed Plan may be submitted to USACE during the comment period. Comment letters must be postmarked no later than January 14, 2026, and may be sent to James Kelly (USACE, New England District, Project Manager):

U.S. Army Corps of Engineers
Attn: James Kelly
696 Virgina Road
Concord, MA 01742

james.a.kelly@usace.army.mil

PUBLIC MEETING

December 17, 2025 at 7:00 PM
Meeting Location: Edison Senior Citizen Center, 2963 Woodbridge Avenue, Edison, NJ 08837

INTRODUCTION

The U.S. Army Corps of Engineers (USACE) is presenting this Proposed Plan to allow the public the opportunity to review and comment on the **remedial alternatives** for Dredge Spoil Area (DSA) 4 and DSA 6 at the Former Raritan Arsenal **Formerly Used Defense Site** located in Middlesex County, New Jersey. The areas are located in the Raritan River, and encompass 94 acres (Figure 1 - Table 1).

Table 1. Areas of Investigation

Area of Investigation	Township	Total acres
DSA 6	Borough of Sayreville	16
DSA 4	Woodbridge	4
DSA 4	Edison	74
TOTAL		94

Investigation and environmental restoration of the Former Raritan Arsenal has been conducted under the **Defense Environmental Restoration Program–Formerly Used Defense Sites**. DSA 6 is located within the Borough of Sayreville; the majority of DSA 4 is located within Edison Township, but the northernmost portion is located in Woodbridge Township.

This Proposed Plan highlights key information from the **Remedial Investigation** and the alternatives evaluated in the **Feasibility Study** (USACE, 2024). It also provides the basis for identification of the **Preferred Alternative**. USACE will select a final remedy for the site after reviewing and considering all information submitted during the **public comment period** and may modify the Preferred Alternative or select another response action based on new information or public comments. Therefore, the public is encouraged to review and comment on the alternatives presented in this Proposed Plan.

The USACE is the lead agency that provides direction and guidance for the execution of the project. The USACE-New York District is managing the project, while the U.S. Army Engineering and Support Center, Huntsville, and USACE – New England District provide technical support.

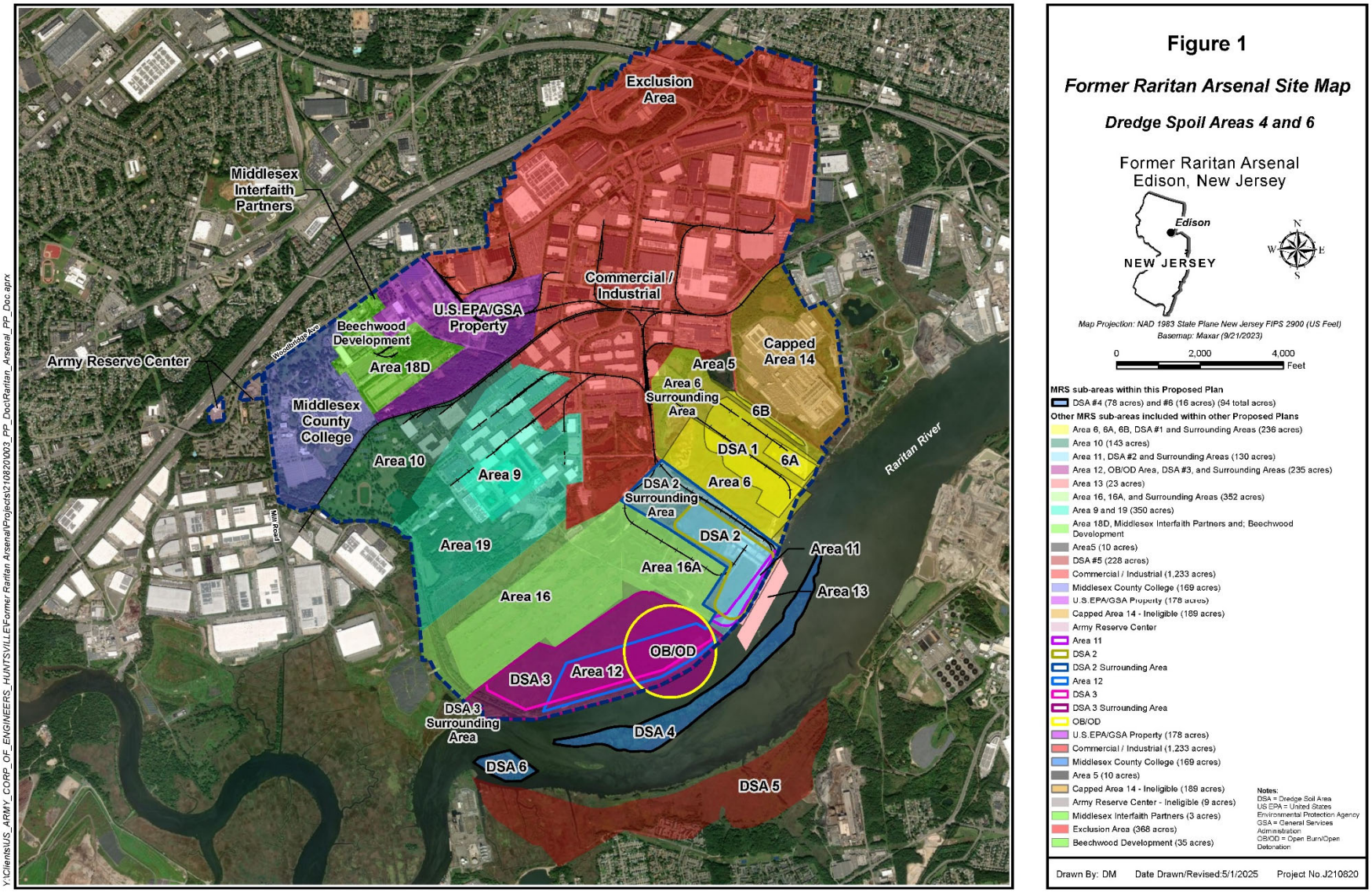

Figure 1. Former Raritan Arsenal Site Map, Dredge Spoil Areas 4 and 6

The lead regulatory agency is the New Jersey Department of Environmental Protection (NJDEP). The overall goal of Defense Environmental Restoration Program (DERP)– Formerly Used Defense Sites (FUDS) is to address unacceptable human health and environmental risks associated with past Department of Defense activities. USACE is required by DERP-FUDS to execute the environmental restoration program in accordance with **Comprehensive Environmental Response, Compensation, and Liability Act** of 1980 (CERCLA), a federal environmental statute, and the **National Oil and Hazardous Substances Pollution Contingency Plan** (NCP). USACE evaluates potential impacts from past Department of Defense activities at the Former Raritan Arsenal and identifies appropriate remedial responses. The NJDEP has been involved in this process. In accordance with federal law and regulations, state involvement is sought in the form of reviews. USACE has also been conferring with local stakeholders about community concerns regarding the Former Raritan Arsenal since 1990.

As the lead agency implementing the environmental response program for the Former Raritan Arsenal, USACE has prepared this Proposed Plan in accordance with CERCLA Section 117(a) and Section 300.430(f)(2) of the NCP to continue its community awareness efforts and to encourage public participation. After the public has had the opportunity to review and comment on this Proposed Plan, USACE will carefully consider and respond to the comments received during the public comment period, including any comments received during the public meeting. The comments will be included in the responsiveness summary of the **Record of Decision**. Information about the **public comment period** and the public meeting is shown below.

This Proposed Plan highlights key information from previous reports prepared for DSAs 4 and 6, including site characterization details provided in the Remedial Investigation Report (USACE, 2020) and the Feasibility Study (USACE, 2024). The Former Raritan Arsenal currently constitutes two **Munitions Response Sites** (MRS) – MRS 03, which is 3,283.50 acres and MRS 04, which is 1.40 acres. Final reconciliation of total site acreages will be resolved during the final delineation effort and confirmed in the Remedial Design. A MRS is discrete location within a Munitions Response Area (MRA) that is known to require a munitions response. Based on historic operations of the Former Raritan Arsenal the entire property boundary was identified as both a MRA and a MRS. This Proposed Plan is for the sub-MRS areas as listed in Table 1 above and shown on Figure 1. USACE completed an investigation to determine the potential presence of munitions and explosives of concern (MEC)and munitions constituents (MC) and the results of the investigation are included within this Proposed Plan.

The **Administrative Record** file and other documents that support this Proposed Plan are available for review at the information repositories or through the USACE website for the Former Raritan Arsenal:

https://www.nae.usace.army.mil/missions/projects-topics/former-raritan-arsenal/

Information Repository:

U.S. Army Corps of Engineers, New York District
2890 Woodbridge Avenue
Edison, NJ 08837

Administrative Record Location

USACE New York District Office
26 Federal Plaza
New York, NY 10278

SITE HISTORY AND BACKGROUND

The Former Raritan Arsenal is located on the northern bank of the Raritan River in Middlesex County, New Jersey (Figure 2). Historical data provided the basis for extending the Remedial Investigation beyond the Former Raritan Arsenal boundary to include DSA 4 and 6. DSA 4 and 6 comprise two small islands (collectively known as Crab Island) located within the Raritan River.

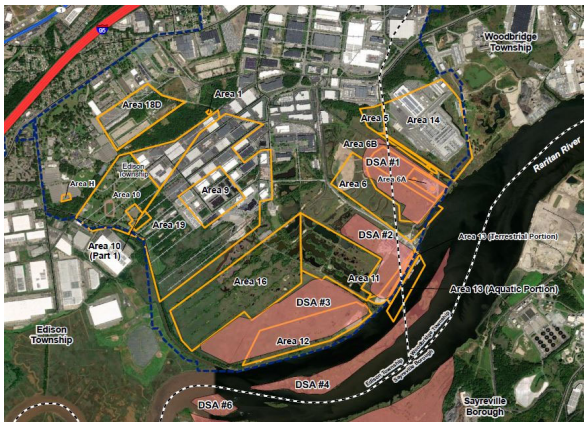

Figure 2. Location of the Former Raritan Arsenal

The majority of the Former Raritan Arsenal land area lies within Edison Township, with portions located in Woodbridge Township and the Borough of Sayreville. It is bordered to the north and northwest by Woodbridge Avenue, to the southwest by Mill Road and the Industrial Land Reclamation Landfill, and to the east by the Raritan River.

The Former Raritan Arsenal was initially developed to facilitate military shipments during World War I. The initial land purchased for development of the Former Raritan Arsenal consisted of tidal marsh, quarries, and farmland. The War Department purchased the land in December 1917, and construction of the Raritan Arsenal was underway by the beginning of 1918. Ordnance was first received at the Raritan Arsenal during the early phases of construction. On May 2, 1918, the Raritan Arsenal contained military facilities that included magazines, a railway network, locomotive houses, docks, warehouses, assembly and process buildings, administration buildings, storage buildings, and living quarters, and was declared operational (USACE, 2007).

The principal function of the Raritan Arsenal was to store, handle, and ship various classes of ordnance and military supplies. Other activities and missions included assembly of automobiles, trucks, tanks, and motorized artillery; preservation, renovation, and manufacture of munitions; salvaging, linking, belting, clipping, packing, demilitarizing, and maintaining ammunition; requisition, research, and development of ordnance; military supply chain management; and troop training.

In March 1961, the Department of Defense announced the proposed disposition of the Raritan Arsenal, and in 1964, the General Services Administration began selling the Former Raritan Arsenal property. At the time of the disposition announcement, the Former Raritan Arsenal contained approximately 440 buildings and more than 62 miles of roads and railways. Since closure, the Former Raritan Arsenal has been redeveloped extensively, primarily for commercial and industrial uses, particularly in the northern portion of the facility.

DSA 4 and 6 comprise two small islands (collectively known as Crab Island) located within the Raritan River. DSA 6 is a privately owned 16-acre parcel, and DSA 4 is a **non-parcel area** without official legal boundaries that consists of 78 acres of dredge deposits within the Raritan River (see Figure 2). The DSA 4 and DSA 6 area is underlain by dredge spoils that were removed from the Raritan River and deposited during historical dredging operations. The property owner of DSA 6 stated that no activities are currently occurring on the property and that land use is not anticipated to change in the foreseeable future. Future land use of DSA 4 is not expected to change for the non-parcel area made up of dredge deposits for DSA 4.

DSAs 4 and 6 were established by USACE in April 2012 during development of the Remedial Investigation/Feasibility Study Work Plan (U.S. Army Engineering and Support Center, Huntsville, 2016) because previous investigations and historical records identified the presence of fill material across various areas of the former Arsenal that appeared to be dredge spoils from the river. For purposes of investigation, USACE considered the DSAs to comprise six individual areas identified as DSAs 1 through 6. USACE defined the boundaries between the DSAs on the former Arsenal based on a review of subsurface data collected during previous investigations and other physical observations. The limits of DSAs 4 and 6 were defined based on the physical limits of the islands.

A 300-foot-wide, 25-foot-deep channel has historically been maintained by USACE from Raritan Bay upriver to immediately downstream of the former Arsenal. A section of the river approximately adjacent to Area 6 and downstream of the former dock at Area 13 was dredged to maintain a turning basin, which vessels used for turning around in the channel after picking up supplies from the former Arsenal. The early (pre-1933) dredge channel continued upstream beyond and immediately adjacent to the Former Raritan Arsenal, whereas more recent dredging activities (World War II-era to 1991) were focused on maintaining a channel downstream of the turning basin toward Raritan Bay. Records indicate that the area adjacent to the former dock in Area 13 was dredged at least once in late 1944, but the channel in this area was likely maintained by dredging throughout the World War I and World War II eras. Additionally, in 1975, USACE increased the depth of the channel at this location by approximately 14 feet by dredging. Reportedly, since 1975, the Raritan River near Area 13 has been subject to periodic

maintenance dredging, with the most recent event occurring in 1992.

Historical records indicate that up until approximately 1956 material from dredging was disposed of within the property boundary of the Former Raritan Arsenal as well as in areas outside the former Arsenal. Anecdotal evidence suggesting that dredged materials were disposed of within DSAs 4 and 6 (Crab Island) is based on informal historical accounts referenced in both the 1993 Dames & Moore Archival Search Report and the 1994 UXB International report, although no formal disposal records have been identified to confirm this activity.

Historical reports indicate that munitions items were observed in material dredged from the Raritan River. For instance, in May 1923, a suction dredge was used to dredge 1,200 feet of frontage along the Arsenal pier (Area 13) to depths of 8 to 10 feet. The project was repeatedly delayed due to the number of grenades and boxes of grenades that were encountered, which caused pipe and pump plugging. The spoils from the May 1923 dredging event were reportedly disposed of in an area behind the Area 13 warehouses (presumed to be Area 11) (USACE-Kansas City District, 1993).

SITE CHARACTERISTICS

DSAs 4 and 6 comprise two small islands (collectively known as Crab Island) located within the Raritan River. DSA 6 is a privately owned 16-acre parcel, and DSA 4 is a **non-parcel area** that consists of 78 acres of dredge deposits within the Raritan River. DSAs 4 and 6 are underlain by dredge spoils that were removed from the Raritan River and deposited during historical dredging operations. The DSAs are mostly undeveloped wetland. DSAs 4 and 6 are difficult to access because of dense vegetation and the presence of stream channels, soft mudflats, and standing water.

Historical records and archival documentation indicate that dredged material from potentially impacted areas of the Raritan River was deposited within DSAs 4 and 6. Based on these records, potential MEC items include French Rifle grenades and Mk II hand grenades. No MEC items or munitions debris were observed during the Remedial Investigation (RI); however, the potential presence of MEC in the subsurface cannot be ruled out due to the site's history and nature of material placement.

The depth to which munitions may exist is uncertain and may extend beyond 4 feet below ground surface (bgs). However, based on reasonably anticipated future land use and receptor activities, 4 feet bgs was selected as the depth of concern for the Remedial Action Objective (RAO). This depth represents the maximum anticipated disturbance depth associated with recreational use or construction/utility activities, and, therefore, the depth at which potential human interaction with MEC becomes relevant. Munitions that may exist deeper than 4 feet bgs are not considered to pose an unacceptable risk under current or reasonably anticipated land use scenarios.

Land Use

As previously described, DSAs 4 and 6 are undeveloped islands with limited accessibility, which influences current and future land use considerations.

Future land use is expected to be the same as current land use. Although access is physically difficult due to vegetation and soft mud, the islands are not fenced or posted, and no legal restrictions are in place. Therefore, access is not prohibited, and recreators, trespassers, and utility or construction workers could potentially access the islands.

Physical and Environmental Setting

The surface of DSAs 4 and 6 are vegetated marshland consisting of common reed marsh, saltwater cordgrass, and marsh hay. DSAs 4 and 6 experience significant tidal inundation from the Raritan River, are crosscut by channels, and contain mud flats.

Soil boring profiles ranging from 0 – 3 feet below ground surface within the DSAs show dark gray silt material. Observations of shells of ribbed mussels at the surface and at depth suggest that the dredge material originated from estuarine waters. The exact thickness of the dredge material within the DSAs are unknown.

Depth to groundwater is very shallow (estimated at less than 1 to 5 feet) and tidal streams and standing water are frequently encountered.

PREVIOUS INVESTIGATIONS AND ACTIVITIES

The DSAs were established by USACE in April 2012 during development of the Remedial Investigation /Feasibility Study Work Plan because previous

investigation data and historical reports of the presence of fill material across various areas of the former Arsenal that appeared to be dredge spoils from the river (USACE, 2016).

Munitions were encountered within the sediments that were dredged from the Raritan River in the vicinity of the Area 13 dock. Originally, the munitions items may have been lost or spilled in the Raritan River during unloading and loading of cargo ships at the Area 13 dock, as a result of cargo shifts during transport, or because of the potential for the incomplete recovery of items from the Frederick Star #9, an ammunition barge that sank at the Raritan dock on December 12, 1926. Items lost in the river could have been lodged within the river sediments. During subsequent dredging operations, the sediments and any associated items could have been placed within the DSAs. Historical dredging of the Raritan River also included removal of hundreds of thousands of cubic yards of sediment from channels located upstream and downstream of the former Arsenal where munitions are not likely to have been present; therefore, large areas of the DSAs likely do not contain any munitions. For DSAs 4 and 6 specifically, no munitions have been reported on the surface during the Remedial Investigation.

Documents associated with the previous investigations are part of the information repository and are available for review at the location identified in this Proposed Plan. In addition, summaries of data, results, and recommendations associated with these reports were extracted from the individual reports and incorporated into a Remedial Investigation Report (U.S. Army Engineering and Support Center, Huntsville, 2020) to provide a comprehensive summary of the site-specific investigation activities conducted at DSAs 4 and 6. Activities and analysis associated with the Remedial Investigation Report are summarized in the following section.

Remedial Investigation

The RI phase of the CERCLA process is intended to determine the nature and extent of contamination and evaluate potential risks to human health and the environment. For munitions sites, this includes surface clearance, geophysical surveys, anomaly investigations, and risk assessments. The results of these investigations inform whether further action is needed and guide the selection of appropriate remedial alternatives.

At DSAs 4 and 6, the RI was conducted to characterize the site to support development of effective remedial alternatives. Field investigations and baseline risk assessments were conducted to determine whether military munitions and **munitions constituents** (MC) were present, and if so, in what locations and concentrations. This is known as characterizing the nature and extent of munitions and MC. Risk assessments were then performed to evaluate whether munitions or munitions constituents posed an explosive hazard or unacceptable risk to human health or the environment.

DSAs 4 and 6 have not been previously investigated prior to the Remedial Investigation as reported in the DSAs 4, 5, and 6 Remedial Investigation Report (U.S. Army Engineering and Support Center, Huntsville, 2020). A munitions field investigation was conducted at DSAs 4 and 6 from December 2013 to June 2014. No munitions or munitions debris were identified on the surface during the surface clearance activities performed before the survey. However, targets of interest were identified from the geophysical mapping (DGM) data.

At DSA 4, the Remedial Investigation included 2,021 meters of 1-meter-wide DMG **transects,** which detected 8 unknown subsurface targets of interest. At DSA 6, 554 meters of 1-meter-wide transects were completed and identified 4 unknown subsurface targets. Although DSAs 4 and 6 were solid enough (partially frozen) in March 2014 to perform a surface clearance and DGM transects, by June 2014 surface conditions had deteriorated significantly. Personnel attempting to reacquire subsurface targets sank into the mud up to their waists, creating unsafe conditions. As a result, the targets could not be further characterized, and the Remedial Investigation recommended proceeding to a Feasibility Study (FS).

To assess the potential for residual munitions hazards at the site, the Risk Management Methodology tool was applied. The Risk Management Methodology tool considered both current and reasonably anticipated future land use and evaluated:

- The likelihood of a munitions encounter based on access conditions and the amount of munitions;
- The severity of an incident based on the likelihood of encounter and severity associated with unintentional detonation of the munition items at the site; and

- The likelihood of detonation based on the munition's sensitivity and the likelihood to impart energy on an item.

As detailed in the Remedial Investigation Report, this risk evaluation determined there was unacceptable risk to human health due to potential munitions presence at DSAs 4 and 6.

Although no munitions or munitions debris were physically encountered during the RI, archival documentation suggests that materials potentially associated with former Raritan Arsenal operations—such as French Rifle grenades and Mk II hand grenades—may have been deposited in DSAs 4 and 6 via historical dredging. Due to limited site accessibility and variable conditions, complete investigation coverage was not possible. As such, the Risk Management Methodology model was applied conservatively, assuming potential munitions could remain within the upper 4 feet of soil, where human contact is most likely during recreational or construction activities. This analysis supports the conclusion that land use controls are necessary to ensure long-term protectiveness. A Baseline Ecological Risk Assessment Addendum was also completed to evaluate the potential ecological risks from Department of Defense-related activities. No site-related adverse ecological impacts were identified. Therefore, the focus of the FS and Proposed Plan for DSAs 4 and 6 remains solely only on munitions, and not munitions constituents (MC).

SUMMARY OF REMEDIAL INVESTIGATIONS , ACTIVITIES AND CONCLUSIONS

MEC Summary: No munitions or munitions debris were identified at DSAs 4 and 6 during the surface clearance in March 2014. The subsurface target of interest locations could not be intrusively investigated because unstable site conditions posed a significant safety hazard to personnel. As a result, the nature and extent of potential munitions presence could not be fully characterized. The Risk Management Methodology tool was applied to assess potential risk based on site conditions, land use, and the inability to verify the absence of munitions. The Risk Management Methodology tool concluded that DSAs 4 and 6 pose an unacceptable risk to human health due to potential exposure to unexploded ordnance during recreational or subsurface activities. Therefore, the Remedial Investigation recommended a Feasibility Study to evaluate remedial alternatives that would mitigate explosive hazards at the site.

MC Summary: No munitions or munitions debris were identified at DSAs 4 and 6 during the surface clearance, and subsurface anomalies could not be confirmed. Because no MEC was identified, there is no potential source for the release of MC to the environment. Therefore, no soil samples were collected at DSAs 4 and 6. A review of previously completed Baseline Ecological Risk Assessments for nearby areas with similar investigation results, such as Area 11, Area 12, DSA 2, DSA 3, and DSA 5, did not identify site-related ecological risks. Based on these findings and the absence of a source for MC, the Remedial Investigation recommended no further action for MC at DSAs 4 and 6.

SCOPE AND ROLE OF THE ACTION

The Former Raritan Arsenal is a FUDS Property encompassing multiple project areas, of which DSAs 4 and 6 are one component. The overarching strategy for the FUDS Property involves investigating and, where appropriate, remediating areas potentially impacted by historical military use. These efforts are conducted in phases and prioritize areas based on risk, accessibility, and stakeholder input.

Several Site Inspection and RI efforts have been undertaken across the property, targeting both MEC and MC. Previous actions have included surface clearance in upland areas, geophysical surveys, and focused removals where MEC was confirmed.

The remedial action described in this Proposed Plan addresses DSAs 4 and 6 specifically—two low lying islands identified as potentially impacted by historical munitions disposal activities. This action fits into the broader remediation strategy by addressing an area where site-specific conditions (e.g., soft sediments, limited prior access) warranted separate evaluation. The remedy will reduce potential exposure risks while supporting protectiveness across the full site portfolio. Coordination with ongoing and future efforts at other portions of the FUDS Property will continue to ensure consistent land use controls and communication strategies are maintained.

SUMMARY OF SITE RISKS

Risk assessments were performed to evaluate whether MEC at DSAs 4 and 6 posed unacceptable risks to human health or the environment. A munitions hazard risk evaluation tool called Risk Management Methodology was used to aid in the development, evaluation, and selection of appropriate response alternatives. Since MEC were not found during the Remedial Investigation at DSA 4 or DSA 6, MC sampling was not performed. No unacceptable risk was determined for DSA 4 and DSA 6 for MC.

Human Health Risks

MEC Risk Summary: Based on the results of the MEC Risk Management Methodology under current and reasonably anticipated future conditions, MEC poses unacceptable risks to human health at DSAs 4 and 6.

This conclusion accounts for both site constraints and the presence of unresolved subsurface anomalies that could not be fully investigated due to soft sediment conditions during the Remedial Investigation. While no munitions items or munitions debris were physically recovered, the presence of multiple uncharacterized anomalies, combined with archival records indicating historical munitions disposal via dredged sediments, supports the potential for munitions to be present in areas that were not accessible during the investigation.

The conceptual site model suggests that the primary release mechanism is from munitions that may have been embedded within sediments dredged from the Raritan River near the Area 13 dock and placed on the islands. Consistent with CERCLA guidance, the Risk Management Methodology model applied conservative assumptions to account for these data limitations and site history, resulting in a determination of unacceptable risk. Therefore, remedial alternatives for DSAs 4 and 6 were evaluated in the Feasibility Study.

It is USACE'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 based on the unacceptable explosive hazard posed by potential MEC remaining in subsurface areas of DSAs 4 and 6. This determination is supported by the Risk Management Methodology, which applied conservative assumptions based on unresolved anomalies and site history. The recommended action addresses the risk of inadvertent encounter with subsurface munitions that may pose an imminent and substantial endangerment to human health.

MC Risk Summary: The **Human Health Risk Assessment** conducted during the Remedial Investigation did not identify an unacceptable risk associated with exposure of current or future receptors at DSAs 4 and 6 for contaminants of potential concern associated with DoD releases.

Ecological Risk Summary: The ecological risk assessment did not identify any unacceptable risk to ecological receptors at DSAs 4 and 6.

REMEDIAL ACTION OBJECTIVE

The Remedial Action Objective applies only to MEC, not to MC or other contaminants of potential concern, as only MEC was determined to be associated with unacceptable human health or environmental risks in the RI. While no MEC items were discovered during the Remedial Investigation in DSAs 4 and 6, historical dredging records and archival documentation indicate the potential for MEC, specifically French Rifle grenades and Mk II hand grenades, to be present in these areas. These dredging activities occurred in the past; no current or routine dredging is known to occur near DSAs 4 or 6.

Given that soft sediment conditions limited the ability to fully investigate and confirm subsurface anomalies at the site, the Risk Management Methodology model was applied using conservative, site-wide assumptions to model potential MEC presence and associated risk. The Risk Management Methodology model assumed that munitions, if present, could occur within the upper four feet of soil — the zone most likely to be disturbed during recreational use or utility/construction activities. This modeled depth of concern supports the development of the RAO and the protective measures recommended.

Accordingly, the following RAO was developed during the Feasibility Study (USACE, 2024) based on reasonably anticipated future use and conservative exposure assumptions: Prevent interaction with munitions items (French Rifle grenades and Mk II hand grenades) to a depth of 4 feet bgs at DSAs 4 and 6, such that a risk determination of no unacceptable

risk is achieved for current and future potential recreational users/trespassers and construction/utility workers.

SUMMARY OF REMEDIAL ALTERNATIVES

The following alternatives were evaluated for DSAs 4 and 6:

Alternative 1 – No Further Action
No Further Action means that no action, including implementation of a public education program, will be undertaken to reduce, control, or mitigate exposure. This alternative is used in the evaluation of other alternatives to provide a baseline for comparison.

The No Further Action alternative assumes continued use of DSAs 4 and 6 in their present state.

Alternative 2 – Land Use Controls (The Preferred Alternative)
A land use control is any physical (fences), legal (deed restrictions), or administrative (notices and educational materials) mechanism that restricts the use of or limits access to real property to prevent or reduce risks to human health and the environment This alternative uses educational controls to inform and educate the public (i.e., site visitors and landowners) of the danger posed by potential munitions and how to respond if a munitions or explosive hazard is found. Public awareness and outreach will be implemented under the 3Rs Explosives Safety Education Program (Recognize, Retreat, Report). The 3Rs Program outlines the three key steps individuals should follow if they encounter a potential munition:

Recognize: when you may have encountered a munition and that munitions are dangerous,

Retreat: do not approach, touch, move, or disturb it, but carefully leave the area, and

Report: contact local authorities.

Under Alternative 2, USACE would develop and maintain a Land Use Control Implementation Plan (LUCIP) that describes the implementation and maintenance of the following specific Land Use Controls (LUC):

1. Annual Notification Letters: Annual notification letters discussing the history of the property and the potential presence of munitions and the associated risks will be developed and mailed to the property owners for the subject areas and to appropriate offices in the local community (emergency services, Edison Township Engineering Department and Code & Construction Division, other relevant town offices in Edison Township, Woodbridge Township, and Borough of Sayreville) once per year. These letters will also include information on the Edison Township Dig Permit Process, which is an existing dig permit program implemented, enforced, and maintained by Edison Township, as a portion of DSA 4 is located in Edison Township.

2. Implement a 3Rs (Recognize, Retreat, Report) Explosives Safety Education Program: The education program will include a fact sheet on the history of the property that will be provided to the property owners and appropriate offices in the local community. Materials may also be provided via online content at the Former Raritan Arsenal website. Property owners and community stakeholders will be provided 3Rs Explosive Safety Education materials that include information that helps protect property owners, public, and/or site users from the potential dangers associated with the presence of munitions. Specifically, the 3Rs Explosives Safety Guide for the Construction Industry will be provide to property owners, appropriate offices in Edison Township, Woodbridge Township, and Borough of Sayreville and to Edison Township for inclusion for their dig permit materials.

The town of Edison Township currently implements, enforces, and maintains a dig permit program for areas of the Former Raritan Arsenal located in Edison Township. A portion of DSA 4 is located within Edison Township. This is a pre-existing land use control established by Edison Township that supports USACE's RAO of eliminating unacceptable risk, identification of a preferred alternative, and eventual implementation of a selected remedy. USACE is not responsible for this LUC.

3. *Signage*: Signs with appropriate warnings and information will be placed around the islands to inform recreators of the potential presence of munitions. Because the islands are located in the river, the signs may need to be installed on buoys. These signs will be designed to remain visible during high tide and placed at likely river access points.

Durable materials will be used to ensure longevity in dynamic riverine conditions. All signage will include 3Rs (Recognize, Retreat, Report) messaging and UXO warning symbols in accordance with Department of Defense guidance to effectively reach recreational users and trespassers and deter disturbance of potential munitions.

Capital costs for this alternative are $313,800, with operations and maintenance costs totaling $343,800. The total present value cost for this alternative is $1,001,700.

Alternative 3 – Munitions Removal to 1 foot depth and Land Use Controls

Alternative 3 consists of munitions removal to 1 foot bgs and implementation of the same LUCs described in Alternative 2. The munitions removal would include both manual and mechanized intrusive operations to remove munitions from the ground surface and, where detected in the subsurface, down to a depth of 1 foot bgs throughout DSAs 4 and 6 (94 acres). Munitions removals will be supervised and conducted by UXO qualified personnel.

Munitions hazards potentially located 1-4 feet bgs will be managed through the LUCs detailed in Alternative 2.

Surface clearance will occur across all accessible areas of DSAs 4 and 6. However, site conditions, such as dense vegetation, immovable obstacles, or water-saturated soils may preclude visual or geophysical detection and subsequent removal in some locations. Because these conditions are variable and may change over time, the specific boundaries of such areas cannot be reliably mapped at this stage. These locations will be designated as "Exception Areas" during the Remedial Design phase. The Exception Areas will be annotated on a map and identified in materials provided in either the annual notification letters or the 3Rs education program.

Alternative 3 may trigger several applicable or relevant and appropriate requirements (ARARs) due to MEC removal activities. ARARs include the Clean Water Act (40 CFR § 230.10(a)), which prohibits the discharge of dredged or fill material into waters of the United States if there is a practicable alternative that would have less adverse impact on the aquatic ecosystem and the Resource Conservation and Recovery Act (RCRA) Subpart X (40 CFR § 264.601), which applies to munitions moved from the ground and released to the environment and requires testing and management actions to prevent release of new contamination to environment. This alternative complies with ARARs. Alternative 3 is anticipated to cause limited, isolated fill of wetlands due to vegetation clearance for MEC detection, excavation down to 1 feet bgs, and backfilling those locations with clean fill. If necessary, any fill material discharged into wetlands will comply with 40 CFR § 230.10(a), and, for each munition moved prior to detonation, USACE will conduct testing and management actions before, after, and during detonation in compliance with 40 CFR § 264.601.

Capital costs for this alternative are $3,101,303, with operations and maintenance costs totaling $353,800. The total present value cost for this alternative is $3,791,200.

Alternative 4 – Munitions Removal to 4 foot depth

This alternative was not retained for detailed evaluation in the Feasibility Study. The Unlimited Use/Unrestricted Exposure alternative was screened out during the initial alternative evaluation due to its low implementability, high cost, and significant environmental and logistical challenges. The alternative involved complete en masse excavation of the DSA 4 and 6 island areas to a depth of 4 feet bgs, which would require removal of approximately 607,000 cubic yards of wet or submerged sediment. These activities would likely result in extensive ecological disturbance, fill of a significant amount of wetlands, pose complex operational constraints due to water saturation and access limitations, and face considerable landowner and public resistance.

Five-Year Reviews

CERCLA requires review of the selected remedial action no less than every five years if unacceptable conditions remain at the site due to MEC such that the risks do not allow for unlimited use and unrestricted exposure. Therefore, CERCLA Five-Year Reviews would be required for Alternatives 2 and 3.

EVALUATION OF ALTERNATIVES

Seven criteria and two additional modifying criteria (nine total) were used to evaluate each alternative individually and against each other to select a remedy. The nine criteria fall into three groups: threshold, primary balancing, and modifying criteria. The detailed

"Comparative Screening of Response Alternatives" can be found in the Feasibility Study Report.

SUMMARY OF ALTERNATIVE EVALUATION RESULTS

Each alternative was evaluated against the nine criteria and then against each other. The nine criteria include the following:

1. Overall Protection of Human Health and the Environment
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
3. Long-Term Effectiveness and Permanence,
4. Reduction of Toxicity, Mobility, and Volume Through Treatment
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. State Acceptance
9. Community Acceptance

The following conclusions were derived from the comparative analysis.

The NCP requires consideration of nine evaluation criteria to evaluate the proposed remedial alternatives. Explanations of the Nine Evaluation Criteria are included in **Table 2** below.

Comparative Analysis of Alternatives

Alternative 1 – No Further Action does not meet the threshold criteria of overall protection of human health because it does not address the unacceptable risk for interaction with munitions at DSAs 4 and 6. ARARs are not triggered because no action is being taken. It is the least costly ($0) and is easily implementable because it requires no action. There are no short-term adverse impacts to the community, workers, or the environment, but Alternative 1 does not reduce toxicity, mobility, or volume of contaminants through treatment and is not long-term effective or permanent.

Alternative 2 –Land Use Controls (Preferred Alternative) is protective of human health and the environment and does not trigger ARARs. Alternative 2 achieves the Remedial Action Objective by modifying human behavior and preventing interaction with munitions to 4 feet bgs through distribution of annual notification letters to property owners and the local community, implementation of a 3Rs educational program, and installation of signs, around the islands.

Alternative 2 is easily and readily implementable. It is more costly than Alternative 1 (No Further Action), but it is significantly more cost-effective than Alternative 3. Because it involves no construction activities, it poses no short-term risks to the community or to workers and has no environmental impact. It achieves protection once the LUCs are implemented. It does not reduce toxicity, mobility, and volume, through treatment, but achieves long-term effectiveness through behavior modification to reduce the likelihood of exposure.

Alternative 3 – Munitions removal to 1 foot and Land Use Controls is protective of human health and the environment by removing munitions 1 foot bgs and modifying human behavior through LUCs for potential munitions located 2-4 feet bgs. This alternative complies with ARARs. During munitions removal, any fill material discharged into wetlands will comply with 40 CFR § 230.10(a), and, for each munition moved prior to detonation, USACE will conduct testing and management actions before, after, and during detonation in compliance with 40 CFR § 264.601. Alternative 3 has significantly higher costs than Alternatives 1 and 2. This Alternative has low implementability compared to Alternatives 1 and 2 because of the logistical and technical challenges of the terrain of DSAs 4 and 6. During previous investigations, personnel sank up to their wastes in mud. This Alternative is less effective in the short-term because it has the greatest negative environmental impacts and poses health and safety risks to workers during munitions removal to 1 ft bgs. This alternative is long-term effective and reduces the mobility and volume of MEC to 1 ft bgs; however it has low property owner acceptance, high costs, and low implementability.

State and Community Acceptance of Alternatives

These modifying criteria will be addressed in the Record of Decision after consideration of comments received during review of the Proposed Plan and Proposed Plan public comment period. NJDEP concurred with the findings and conclusions of the Remedial Investigation and Feasibility Study.

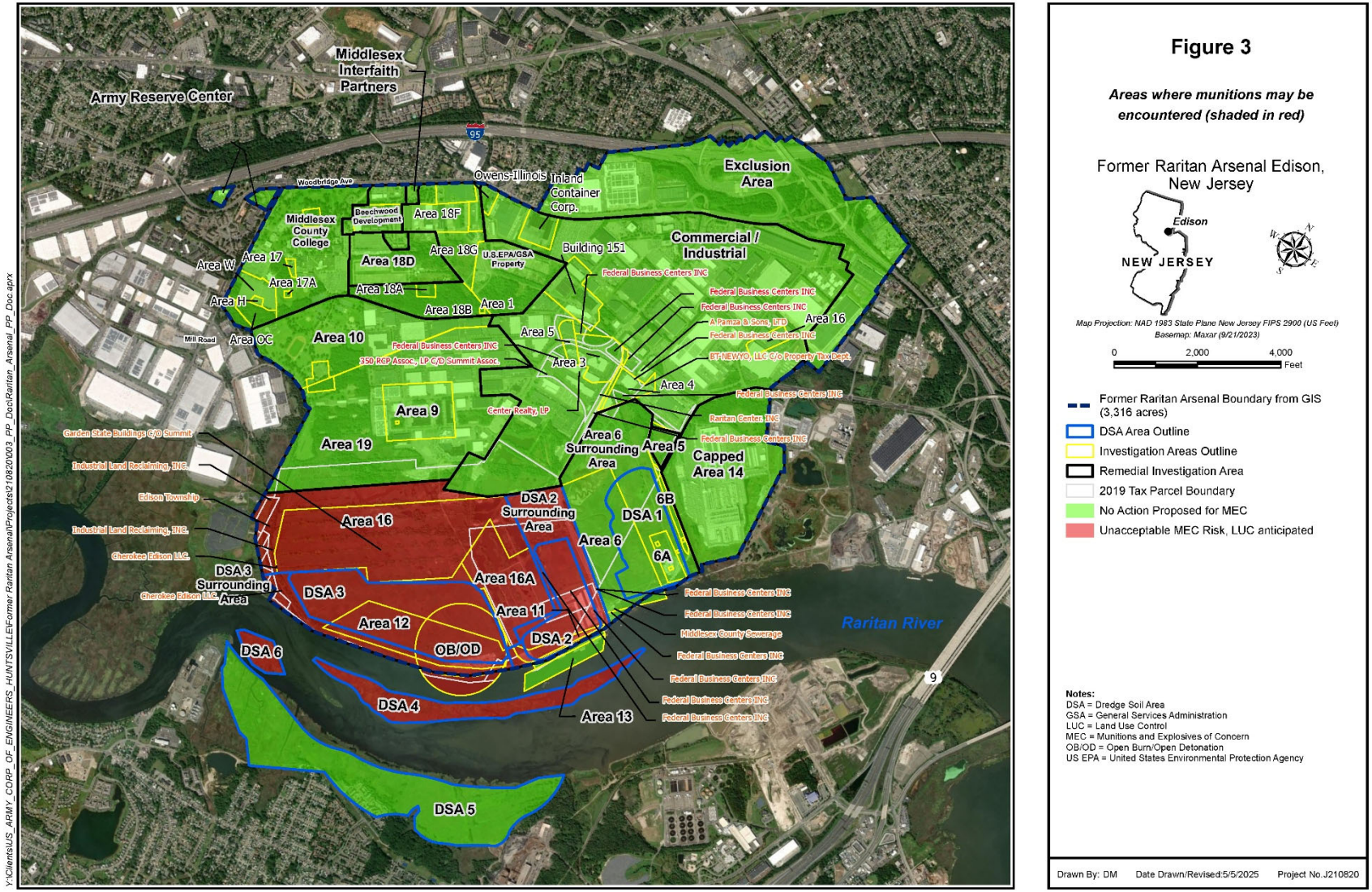

Figure 3. Areas where munitions may be encountered (shaded in red)

Table 2 Individual Analysis of Remedial Alternatives

Criterion	Alternative 1 No Action	Alternative 2 Land Use Controls (Preferred Alternative)	Alternative 3 MEC Removal to 1-foot depth and LUCs
Threshold Criteria			
1 Overall Protection of Human Health and the Environment	No. Provides no protection to human health or the environment.	Yes. Protects human health and the environment and achieves the RAO by providing education and raising public awareness of the history of the site and potential for munitions to remain in the subsurface. Modifies receptor behavior through annual notification letters to the property owners and local community, implementation of a 3Rs Education Program, and signs.	Yes. Achieves the RAO and protection of human health and the environment by 1) removing MEC to 1 ft bgs and, 2) using LUCs to modify potential receptor exposure for MEC hazards 2-4 ft bgs. Modifies receptor behavior through annual notification letters to the property owners and local community, implementation of a 3Rs Education Program, and signs.
2 Compliance with ARARs	Not Applicable.	Not Applicable.	Yes. During munitions removal, any fill material discharged into wetlands will comply with 40 CFR § 230.10(a), and, for each munition moved prior to detonation, USACE will conduct testing and management actions before, after, and during detonation in compliance with 40 CFR § 264.601.
Primary Balancing Criteria			
3 Long-term Effectiveness and Permanence	Provides no long-term effectiveness or protection from potential MEC hazards.	LUCs will ensure that receptor exposure to MEC is limited and are effective in the long-term. MEC would remain in the subsurface, and potential future human health risks, if subsurface intrusive activities were conducted, would remain. However, the educational materials would educate landowners and the community on the risks associated with potential MEC.	MEC removal to 1 foot bgs will reduce the quantity of MEC and LUCs will modify receptor behavior for depths 2-4 ft bgs, resulting in long-term effectiveness and permanence.

Criterion	Alternative 1 No Action	Alternative 2 Land Use Controls (Preferred Alternative)	Alternative 3 MEC Removal to 1-foot depth and LUCs
4 Reduction in Toxicity, Mobility, and Volume Through Treatment	This alternative does not involve treatment.	This alternative does not involve treatment.	This alternative uses treatment (i.e. removal and disposal of MEC) to reduce the mobility and volume of MEC to 1 ft depth bgs. No treatment is proposed for potential MEC located 2-4 ft bgs. The alternative's effects are irreversible.
5 Short-term Effectiveness	This includes no remedial actions and therefore would not present significant additional risk to the community, workers, or the environment.	Because this alternative includes no construction activities, there is no risk for adverse effects on workers, the community, or the environment during implementation of this alternative. This alternative is effective in the short term and can achieve protection upon implementation of the LUCs (less than 1 year).	The remedy is effective as soon as MEC removal is completed and LUCs are in place. Moderate risk posed to construction workers and the community during MEC removal to 1 ft bgs. Moderate environmental impacts will result from constructing temporary access trails and roads, clearing vegetation for detection, excavation of near-surface MEC items, and conducting consolidated shot and/or BIP detonations. RAOs will be achieved in approximately 1 to 2 years—as soon as removal activities are complete and LUCs are implemented. No additional risks or environmental impacts will result from implementing the LUCs.
6 Implementability	Readily implementable because it requires no action.	LUCs are easily implemented because they pose no technical difficulties, and the materials and services needed are available.	Implementation of MEC removal to 1 foot bgs and instituting LUCs are technically feasible but not readily executable due to the site's location, access limitations (accessible only by boat or barge), and unstable site conditions (soft, water-saturated dredge material resulting in highly unstable footing). These conditions significantly constrain mobilization of equipment and personnel, limit staging areas, and complicate daily logistics and safety. Surface removal operations would require specialized marine transport, temporary over-water platforms or barges, and weather-dependent scheduling, all of which affect the ease and reliability of operations. Administrative feasibility is reduced by the need to coordinate with multiple regulatory and navigation authorities, while technical feasibility remains achievable through established UXO procedures. Required services, materials, and qualified UXO personnel are available regionally, but execution would be logistically complex, safety-sensitive, and resource-intensive compared to land-based operations. For these reasons, the alternative is considered feasible but not readily executable.

Criterion	Alternative 1 No Action	Alternative 2 Land Use Controls (Preferred Alternative)	Alternative 3 MEC Removal to 1-foot depth and LUCs
7 Total Present Value Cost Capital Cost Operations and maintenance	$0	$1,001,700 $313,800 $353,800	$3,791,200 $3,101,300 $353,800

PREFERRED ALTERNATIVE

The Preferred Alternative for DSAs 4 and 6 is Alternative 2 – Land Use Controls. The LUCs will include the distribution of Annual Notification Letters to property owners and the local community, implementation of the 3Rs (Recognize, Retreat, Report) Explosives Safety Education Program, and installation of signs.

The preferred alternative is effective at modifying human behavior at DSAs 4 and 6. There is currently limited access to the undeveloped islands, and Land Use Controls will modify behavior by raising public awareness of the history of the Former Raritan Arsenal and the potential for munitions to remain in the subsurface of DSAs 4 and 6. The Remedial Action Objective defines unacceptable risk as any interaction with munitions to a depth of 4 feet bgs, and the Land Use Controls are designed to reach both surface users and those engaged in subsurface activities. This includes mechanisms to influence the behavior of recreators, trespassers, and utility or construction workers.

Based on information currently available, USACE believes the Preferred Alternative meets the threshold criteria and provides the best balance of trade offs among the other alternatives with respect to the balancing and modifying criteria.

USACE expects the Preferred Alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs; and (3) be cost-effective. Implementation of treatment technologies or permanent solutions (such as excavation) was determined not to be practicable due to the site conditions of these undeveloped, densely vegetated, dredge spoil islands, the technical and logistical challenges of performing MEC removal, and associated the negative environmental impacts. Therefore, the Preferred Alternative does not meet the statutory preference for treatment; however, this preference is waived because the modest benefits of treatment are outweighed by the environmental impacts, costs and low implementability of detecting and disposing of any potential MEC.

This preferred alternative is the most cost effective and easiest to implement compared to Alternative 3. NJDEP concurred with USACEs Remedial Investigation Reports (USACE, 2020) and the Feasibility Study (USACE, 2024). The NJDEP will review this Proposed Plan as part of the public review period.

The Preferred Alternative presented in this Proposed Plan may be modified based on public comments and new information.

COMMUNITY PARTICIPATION

One of the purposes of this Proposed Plan is to solicit comments from members of the public. USACE encourages the public to gain a more comprehensive understanding of the Former Raritan Arsenal and the activities that have been conducted there. USACE maintains the information repository and administrative record for the Former Raritan Arsenal. Detailed information about the previous studies and restoration activities can be found in the reports and documents contained in the information repository and administrative record located at the addresses below:

Information Repository:

U.S. Army Corps of Engineers, New York District
2890 Woodbridge Avenue
Edison, NJ 08837

Administrative Record
USACE New York District Office
26 Federal Plaza
New York, NY 10278

Information can also be found through the USACE website for the Former Raritan Arsenal:
https://www.nae.usace.army.mil/missions/projects-topics/former-raritan-arsenal/

The public comment period for this Proposed Plan is December 8, 2025, to January 14, 2026.

For further information on the Proposed Plan for Dredge Spoil Areas 4 and 6, please contact:

U.S. Army Corps of Engineers – New England District
Attn: James Kelly
696 Virgina Road
Concord, MA 01742

e-mail address: James.A.Kelly@usace.army.mil

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U.S. Army Corps of Engineers (USACE), 2007. Management Action Plan: Former Raritan Arsenal, Edison, New Jersey. January.

U.S. Army Corps of Engineers (USACE), 1993. Archival Search Report, Former Raritan Arsenal, Edison, New Jersey, Volumes 1 and 2. July.

U.S. Army Corps of Engineers (USACE), 2016. Remedial Investigation/Feasibility Study Work Plan, Former Raritan Arsenal, Edison, New Jersey. October.

U.S. Army Corps of Engineers (USACE), 2020. Final Dredge Spoil Areas 4, 5, and 6 Remedial Investigation Report, Former Raritan Arsenal, Edison, New Jersey. January.

U.S. Army Corps of Engineers (USACE), 2024. Final Feasibility Study, Dredge Spoil Areas 4 and 6, Former Raritan Arsenal, Edison, New Jersey. September.

ABBREVIATIONS AND ACRONYMS

3Rs	Recognize, Retreat, Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DERP	Defense Environmental Restoration Program
DGM	digital geophysical mapping
DoD	Department of Defense
DSA	dredge spoil area
FS	feasibility study
FUDS	Formerly Used Defense Site
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
MRS	munitions response site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
RI	remedial investigation
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance

GLOSSARY OF TERMS

Administrative Record: The body of documents that informs the public of the site investigation and "forms the basis" for the selection of a particular response at a site. Documents that are included are relevant documents that were relied upon in selecting the response action as well as relevant documents that were considered but were ultimately rejected.

Anomaly: A location identified during a geophysical survey where the signal response differs from the surrounding area, potentially indicating the presence of a buried metallic object.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980: A federal law that authorizes the President to respond to releases or threatened releases of hazardous substances into the environment. This law also establishes criteria for the creation of key documents such as the Remedial Investigation Report, Proposed Plan, and Record of Decision document.

Defense Environmental Restoration Program: The DoD environmental restoration program authorized as a section of SARA in 1986. DERP authorizes and governs the evaluation and cleanup of contamination and other environmental conditions at Department of Defense installations and Formerly Used Defense Sites. (10 USC § 2700 et. seq.).

Formerly Used Defense Site Property: A FUDS is defined as real property that was owned by, leased to, or otherwise possessed by the United States and under the jurisdiction of the Secretary that was transferred from DoD control prior to 17 October 1986 (10 USC § 2701(c)(1)(B)). The term "Secretary" means the Secretary of Defense and the Secretaries of each of the Military Departments, as well as the Secretaries of any predecessor departments or agencies of DoD. Formerly Used Defense Site Properties can be located within the 50 States, District of Columbia, Territories, Commonwealths, and possessions under the jurisdiction of the United States.

Human Health Risk Assessment: A Human Health Risk Assessment evaluates the carcinogenic and noncarcinogenic risks presented by contaminants at a site for current and potential future property uses.

Information Repository: A repository, generally located at libraries or other publicly accessible locations in or near the community affected by the FUDS Project, which contains accurate and up to date documents reflecting the on-going environmental restoration activities. This may include the EE/CA, CRP, RAB meeting minutes, RI, FS, PP, public notices, public comments and responses to those comments, ROD, etc. (EP 200-3-1).

Land Use Controls: Any type of physical, legal, or administrative mechanism that restricts the use of or limits access to real property to prevent or reduce risks to human health and the environment.

MEC Risk Management Methodology: A system used by the U.S. Army Corps of Engineers (USACE) to assess the risk associated with Munitions and Explosives of Concern (MEC) at sites like former military installations, considering factors like the likelihood of encountering MEC, the potential severity of an explosive incident, and the sensitivity of the munitions involved, allowing them to identify and manage potential risks at these locations.

Military Munitions: All ammunition products and components produced for or used by the United States armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components of any item specified herein. The term does not include wholly inert items, improvised explosive devices, or nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC § 2011, et seq.) have been completed (10 USC § 101(f)(4)).

Munitions Constituents: Any materials originating from munitions, including explosive and non-explosive materials and emission, degradation, or breakdown elements of ordnance or munitions.

Munitions Debris: Remnants of munitions remaining after munitions use, demilitarization, or disposal.

Munitions and Explosives of Concern: Specific categories of military munitions that may pose unique explosive safety risks, such as unexploded ordnance, discarded military munitions, or munitions constituents, that are present in high enough concentrations to pose an explosive hazard.

Munitions Response Site: A discrete location within a munitions response area that is known to require a munitions response.

Non-parcel area: A piece of land that is not officially defined or separated as a distinct parcel with legal boundaries.

National Oil and Hazardous Substances Pollution Contingency Plan: Also called the National Contingency Plan or NCP, it is the federal government's blueprint developed and published in 1968 for responding to both oil spills and hazardous substance releases.

Preferred Alternative: The alternative that, when compared to other alternatives, best meets the Comprehensive Environmental Response, Compensation, and Liability Act evaluation criteria, and is proposed for implementation at a site.

Proposed Plan:
In the first step in the remedy selection process, the lead agency identifies the remedial action alternative that best meets the requirements in the NCP § 300.430(f)(1) and (f)(2) and presents that preferred alternative to the public in a proposed plan. The purpose of the proposed plan is to supplement the RI/FS and provide the public with a reasonable opportunity to comment on the preferred alternative for remedial action, as well as alternative plans under consideration, and to offer comments on the proposed remedial action at a site.

Public Comment Period: A prescribed period during which the public may comment on various documents and actions taken by the government and regulatory agencies.

Record of Decision:
The ROD is a public document that reflects the decision of an authorized agency official selecting a remedial action to respond to a CERCLA release that requires a remedy at a CERCLA site. DoD uses the term ROD for remedy selection decisions at all DERP sites.

Remedial Alternative: A proposed cleanup method or strategy considered during the process of environmental remediation at a contaminated site.

Remedial Investigation/Feasibility Study: An in-depth study designed to gather the data necessary to determine the nature and extent of a release or threat of a release of contamination at a site, assess risk to human health and the environment related to the release, and establish criteria for cleaning up the site. During the FS, the Remedial Investigation data are analyzed and remedial alternatives are identified and evaluated for their ability to satisfy the remedy selection criteria required by CERCLA and the NCP. The FS serves as the mechanism for the development, screening, and detailed evaluation of alternative remedial actions(40 CFR 300.430).

Transects: During the planning phase of the Remedial Investigation, a systematic random sampling method was used to divide DSA 4 and DSA 6 into transects to achieve 95% confidence that at least 95% of the remainder of each site has no items of interest. Visual Sampling Plan software was used to determine the quantity of transect paths that were needed to be surveyed to achieve the desired confidence level (95%). A total of 58 transect segments of 135 feet combined were planned for DSA 4 and a total of 58 transect segments of 27 feet combined were planned for DSA 6. Transects spaced evenly 10 feet apart were distributed across each area. Distances were measured between transect stakes to ensure correct positioning. Local coordinates were converted to geodetic coordinates using reference locations (stakes) surveyed in by licensed surveyors on evenly spaced centers to ensure accuracy.