

Proposed Plan Former Raritan Arsenal Commercial/Industrial Area Edison and Woodbridge, New Jersey

The Proposed Plan

This Proposed Plan was prepared by the U.S. Army Corps of Engineers (the Corps), New England and New York Districts, to present the proposed response to soil contamination at the Commercial/Industrial Area at the former Raritan Arsenal in Edison and Woodbridge Townships, New Jersey. This plan summarizes the Corps' rationale for recommending No Further Action for soil at the Commercial/Industrial Area.

Introduction

This Proposed Plan provides information to the public on the Corps' recommended response for soil contamination at the Commercial/Industrial Area (C/I Area) (the Site) at the former Raritan Arsenal in Edison and Woodbridge Townships, New Jersey. This Proposed Plan presents the Corps' rationale for the preferred approach for the C/I Area, and is a tool to encourage and facilitate community participation.

The former Raritan Arsenal has been divided into several areas of investigation for soil, referred to as Remedial Investigation (RI) Areas, based on a combination of property ownership, land use, and historical Investigation Area boundaries. The C/I Area is one of these RI Areas. Site-wide groundwater and vapor intrusion concerns have been evaluated in a separate investigation. This No Further Action Proposed Plan is for the C/I Area and focuses on the identified hazardous and toxic waste (HTW) soil contamination associated with the C/I Area. Figure 1 presents a Site Layout of the former Raritan Arsenal. The C/I Area represents the largest portion of the former Raritan Arsenal and is shown in red.

While not the focus of this Proposed Plan, it bears mentioning that all vapor intrusion (VI) concerns associated with the C/I Area from volatile organic compound contamination in soil or groundwater have been addressed. All buildings that could possibly be affected by the VI pathway have been evaluated and/or sampled. There are two buildings within the C/I Area that continue to be monitored. Building 160 has a VI system in place and Campus Plaza 4 continues with annual sampling. There is one groundwater plume known as AOC-2 within the C/I Area which continues to be monitored under the Site-Wide Groundwater and VI Long Term Monitoring Program as documented in a Final Decision Document, dated May 2019.

Another component of the ongoing investigations at the former Raritan Arsenal is concern about munitions and explosives of concern (MEC) that may remain buried in soil. To address this concern, the Corps completed a RI specifically for MEC that includes a Hazard Assessment (HA) for the entire C/I Area to evaluate the likelihood of encountering MEC in the future. The results of the MEC RI were used to complete a Feasibility Study (FS) for MEC for select areas within the C/I Area. This document is currently in Draft format. A separate Proposed Plan and Decision Document specifically for MEC at the C/I Area will be prepared.



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Regulatory Authority

Federal and state environmental laws govern characterization and response activities at federal facilities. The investigation and environmental restoration of the former Raritan Arsenal has been conducted under the Defense Environmental Restoration Program – Formerly Used Defense Sites (DERP-FUDS).

The overall goal under the DERP-FUDS is to achieve environmental restoration of the former Raritan Arsenal and to address potential human health and environmental risks associated with past Department of Defense (DOD) activities. The federal statute, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), establishes procedures for site investigation, evaluation, and remediation. The Corps has followed the CERCLA process to identify the scope of environmental contamination and appropriate remedial response. The New Jersey Department of Environmental Protection (NJDEP) is the lead regulator for this Site. The Corps has also been conferring with local stakeholders since 1990 about community concerns regarding the Site.

Public Participation

As the lead agency for implementing the environmental response program for the former Raritan Arsenal, the Corps has prepared this Proposed Plan in accordance with CERCLA Section 117(a) and Section 300.430(f)(2) of the National Contingency Plan (NCP) to continue its community awareness efforts and to encourage public participation. After the public has the opportunity to review and comment on this



Proposed Plan, the Corps will summarize and respond to the comments received during the public comment period and at a public meeting. Information on the times and places for public comment and the public meeting are shown in the Public Comments highlight box.

The Corps will carefully consider all comments received from the public and provide responses which will be compiled into a Responsiveness Summary. The decision on which action is appropriate for the C/I Area will be detailed in a Decision Document, which will include the Responsiveness Summary.

This Proposed Plan highlights key information from previous investigations including the baseline human health risk assessment that was documented in the *Final Remedial Investigations and Remedial Actions Summary Report* (March 2018).

The 2018 RI and this Proposed Plan are available for review through the Corps' website for the former Raritan Arsenal:

http://www.nan.usace.army.mil/Raritan

To access the 2018 RI and the Proposed Plan, click on the 'Public Documents' link in the webpage above. Other documents related to the C/I Area can be obtained directly from Mr. Matthew Creamer via email (Matthew.T.Creamer@usace.army.mil) or phone (917-790-8335).

Site Background

Where is the former Raritan Arsenal?

The former Raritan Arsenal lies along the north bank of the Raritan River, mostly in Edison Township with a portion of the site located in Woodbridge Township, approximately 20 miles southwest of lower Manhattan. It is bordered to the north and northwest by Woodbridge Avenue (Route 514), to the southwest by Mill Road and the Industrial Land Reclamation (ILR) Landfill, and to the east by vacant and industrial properties. Figure 2 presents the former Raritan Arsenal location.



Figure 2 - Map showing the location of the former Raritan Arsenal site in Edison and Woodbridge Townships.

Public Comments Are Requested

PUBLIC COMMENT PERIOD December 5, 2019 – January 9, 2019 Written comments on this Proposed Plan can be submitted to the Corps during this comment period. Comment letters must be postmarked no later than December 30, 2019 and can be sent to Mr. Matthew Creamer, Project Manager, U.S. Army Corps of Engineers, Jacob K. Javits Federal Building 26 Federal Plaza, Room 1811. New York, NY 10278. Comments can also be sent by email to: Matthew.T.Creamer@usace.army.mil.

PUBLIC MEETING

Thursday, December 5, 2019 The Corps will host an information session from 7:00 PM to 8:00 PM at the Edison Senior Citizen Center (2963 Woodbridge Avenue, Edison, New Jersey) to provide information and answer questions in an informal setting. This meeting will include a brief introduction and summary by the Corps and an opportunity to submit public comments – whether verbally or in writing.



What was the former Raritan Arsenal used for?

The former Raritan Arsenal was used by the U.S. Army from 1917 to 1963. Operations at the arsenal included the receipt, storage, shipment, and decommissioning of ordnance, arms, and machinery. Some waste material, including ordnance and chemical agents, were reportedly buried on site. It has also been reported that explosive materials were routinely destroyed by surface burning or burning in chambers or pits. Accidental explosions in magazine buildings and outdoor storage areas reportedly scattered materials over large areas, and drove ordnance fragments into the ground. Site operations were phased out between 1961 and 1963.

What is the history of the C/I Area?

The C/I Area occupies 1,233 acres in the far north of the former Raritan Arsenal. The C/I Area has been developed into the Raritan Center Industrial Park. The Raritan Center Industrial Park is one of New Jersey's largest office/light industrial centers. It contains over 90 office buildings, storage warehouses, and light manufacturing facilities.

Initial Missions (1917-1918): Upon completion of construction activities. the Raritan Arsenal had three missions. The first was to serve as a depot for the storage and handling of the various classes of ordnance material and general supplies intended for shipment to the American Expeditionary Force in Europe. To ensure the efficient receipt of munitions, weapons, and equipment from inland ordnance installations and manufacturing plants, and to ensure their prompt delivery to the New York City Port of Embarkation, the Raritan Arsenal contained an elaborate network of rail and dock facilities. The Raritan Arsenal's second mission was to house an Assembling Plant with facilities for constructing automobiles, trucks, tanks, and motorized artillery pieces required for the war effort. A third mission was to serve as a site for an Ordnance Department Training Camp for the

training of troops stationed at the Raritan Arsenal and at other Mid-Atlantic region installations.

<u>Post World War I (WWI, 1919-1922)</u>: Following the end of WWI, a new mission was added for the Raritan Arsenal: the receipt, storage, and preservation of much of the vast quantity of ordnance material scheduled for return from Europe.

Documents suggest that the preferred disposal method was dumping at sea, but they also record at least one instance of ordnance burial on land. The document mentioning this incident does not specify where the 25,000 to 100,000 shells were buried in 1921, or whether all were recovered in 1922 when the disposal site was excavated.

During these years, the Raritan Arsenal and its contractors renovated and salvaged large amounts of ordnance material. A variety of operations that could have caused soil and groundwater contamination were used including explosives melting and washout from shells, open burning of propellants and explosives, and metalworking. Disassembling and renovating bombs, shells, fuzes, and grenades could have generated large amounts of metal fragments. These fragments could have found their way into the soil, both incidentally around work areas and by deliberate burial.

<u>Peace Time Operations (1922-1938)</u>: In the years between the two world wars, the receipt, storage, renovation, salvage, and shipment of ammunition remained Raritan Arsenal's primary mission. However, secondary missions were also implemented including ongoing construction and maintenance functions, Ordnance Specialist School classes, and Shops Department and Field Service Branch operations.

Ordnance salvage and renovation continued during this period, though at a reduced pace.



Operations began at several new locations within the Raritan Arsenal and ended at others. By 1929, salvage operations by outside contractors such as Columbia Salvage had ended, and the Arsenal began doing all ordnance salvage and renovation itself.

Defense Period (1938-1942): The primary mission remained in effect during this period. Receipt, storage, renovation, segregation, salvage, disposal, research and development, manufacture, and shipment of ammunition remained its primary functions, as had been the case since its establishment. The period from 1939 to 1941 saw an increase in activity as the result of increasing world tensions due to the expansion of Germany's armed forces and their movement against neighboring countries during the 1930s.

<u>World War II (WWII, 1942-1948)</u>: With the attack on Pearl Harbor and America's entry into WWII, as in WWI, Raritan Arsenal focused on the receipt, storage, and shipment overseas of ammunition, components, and ordnance supplies. For a time, ammunition renovation, salvage, and related activities had lower priority.

The amount of material handled between 1942 and 1947 probably exceeded the total for all previous years. Numerous new structures were built. Also documented for the first time was the burial of mustard agent at the Raritan Arsenal. Large amounts of ordnance were salvaged and renovated, particularly after the war had ended.

<u>Korean Conflict/Cold War Era (1949-1961)</u>: Raritan Arsenal performed a variety of old and new missions during the period from 1948 until 1961. The Raritan Arsenal's divisions (Supply, Ammunition, Maintenance, and Storage) performed vital functions in support of American involvement in these crises. The Supply Division stored, maintained, and shipped supplies, vehicles, and equipment intended for allies of the United States throughout the world. The Ammunition Division handled ammunition renovation, storage, maintenance, and disposal. The Maintenance Division, through the various shops under its control, repaired, maintained, overhauled, and modified facilities, motor vehicles, and various kinds of ordnance equipment. The Storage Division was responsible for the storage of munitions and ordnance supplies. Ordnance renovation and salvage continued and included new weaponry such as missiles.

<u>Arsenal Phase-Out (1961-1963)</u>: The mission of the Raritan Arsenal during this period was almost solely aimed at shipping out all ordnance material and general supplies to other arsenals and military facilities. Removing usable equipment and decontaminating the grounds and buildings were also mission priorities. In contrast with the first 43 years of Arsenal activity, the level of operations decreased during Raritan Arsenal's last three years. During this period, attention focused on cleanup.

Based on what is known about historical uses of the C/I Area as a result of Archival Search Reports completed in the early 1990s, the following soil Investigation Areas have been identified within the C/I Area (see Figure 3).

- Area 2 Former Demolition Area.
- Area 3 Former Burning and Demolition Area.
- Areas 4 Former TNT Washout and Munitions Demilitarization Area.
- Area 7 Former Ammunition Popping Plant Area.
- Area 8 Former Bulk Propellant Storage Area.
- Area 15 Former Drainage Pit Area.
- Area 20 Former Magazine and Explosives Renovation Area.
- Owens-Illinois Former Fuel Storage Area.
- Building 151 Former Igloo Groundwater Contamination Area.
- Inland Container Corporation Former Chemical Storage Area.



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What was the contamination problem and where did it come from?

Historical contaminants at the C/I Area consisted of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), pesticides, explosives, and metals in surface and subsurface soils, and VOCs, explosives, and metals in groundwater. The source of soil contamination is the presence of buried ordnance, drums, and associated debris.

What is the current site use and what are potential exposures?

Today much of the northern portion of the former Raritan Arsenal is developed by private landowners who have built Raritan Center, a major industrial park complex; United States Environmental Protection Agency (USEPA); and Middlesex County, which owns Thomas A. Edison County Park and Middlesex County College. The southern portion of the Site has remained primarily tidal marsh with limited development since the closing of the former Raritan Arsenal in 1963.

As one of New Jersey's largest office/light industrial centers, the predominant land use is commercial and industrial. Individuals that could be exposed to soil include groundskeepers, construction/utility workers, and indoor (office) workers. Daycare children could also be exposed to soil on a localized basis due to the presence of a daycare facility. Additionally, the baseline human health risk assessment (BHHRA) looked at risks to hypothetical future residents (although this scenario is considered unlikely) to provide information on the need to remediate the site soils to meet unlimited use and unrestricted exposure levels (UU/UE). All of these receptors have the potential to be exposed to surface and/or subsurface soil via incidental ingestion, dermal contact, inhalation of dust emissions, or inhalation of VOCs released from soil. The indoor worker would not be likely to have much

direct contact with soil outside of the office buildings. Therefore, the dermal contact pathway was not evaluated for this receptor in the BHHRA.

There is currently no use of groundwater anywhere at the former Raritan Arsenal, including the C/I Area. All buildings are connected to municipal water. Groundwater is not expected to be used in the future because new buildings will connect to municipal water, and a Classification Exception Area (CEA) is in place for portions of the former Raritan Arsenal. The CEA encompasses the portions of the former Raritan Arsenal where groundwater is contaminated as a result of DoD activities. Therefore, there is no current or future contact with the groundwater, however site-wide groundwater was evaluated separately and is the subject of a separate Proposed Plan/Decision Document. Since indoor air could be affected as a result of vapor intrusion into buildings, the site-wide vapor intrusion pathway was evaluated separately and is the subject of a separate Proposed Plan/Decision Document.

Wildlife habitat is minimal within the C/I Area. For the limited areas with potential ecological receptor exposures, contaminant concentrations and estimated risks were either below a level of concern or similar to background, and potential ecological effects could not be attributed to former DOD activities at the Raritan Arsenal.

Site Characterization

What has the Corps done to investigate the site?

Various studies including multiple RIs have been performed to investigate the contamination issues at the C/I Area since the closing of the Raritan Arsenal. The report titled *Final Remedial Investigations and Remedial Actions Summary Report* (March 2018) summarizes all of the previous studies and interim removal/remedial



actions performed at the C/I Area and presents a human health risk assessment.

The RIs used a variety of characterization tools that are highlighted (see the RI Characterization Tools highlight box). The RIs evaluated all identified potential contamination at the C/I Area, and in one case at Area 4 resulted in an interim response action.

RI Characterization Tools

- Archival searches
- Geophysical surveys
- MEC surveys
- Test pit investigations
- Soil gas surveys
- Soil samples
- Groundwater monitoring well installation and sampling

The first investigation performed was a report prepared in 1963 by the Letterkenny Army Depot that discussed the results of a decontamination (explosive residue only) effort performed by the Army during the closure of the former Raritan Arsenal. Numerous followon investigations and response actions have included:

- Archival searches to identify areas of potential contamination including MEC based on historical operations.
- Geophysical surveys of many portions of the C/I Area to identify subsurface anomalies including discarded military munitions (DMM), munitions debris (MD), and possibly unexploded ordnance (UXO).
- Soil and groundwater investigations that delineated and characterized the levels of contamination throughout the C/I Area.
- Capping of a portion of Area 4.
- MEC removals at Areas 2, 3, 4, 7, 8, and 15.

- Ongoing monitoring of groundwater plumes.
- A BHHRA that evaluated the degree of soil exposure within the C/I Area using healthprotective assumptions on the current and future uses of the area.
- A screening level and baseline ecological risk assessment (SLERA/BERA) that evaluated the potential exposure of ecological receptors in specific habitat types including freshwater drainages, developed land, disturbed fields, and forested uplands. The consequent risk of that exposure was evaluated for a variety of aquatic and terrestrial receptors.

What did the RI and HHRA conclude?

The RIs performed at the C/I Area focused on all areas known or suspected to be contaminated and thoroughly investigated the nature and extent of the contamination. Environmental sampling at the C/I Area began in the early 1990s. Soil samples have been analyzed for over 150 chemical compounds, including VOCs, semivolatile organic compounds (SVOCs), PAHs, pesticides, herbicides, polychlorinated biphenyls (PCBs), explosives, and metals. Figure 3 presents the locations of the soil samples and the interim response action at Area 4.

As part of the 2018 RI, a BHHRA was conducted to estimate potential current and future effects of soil contaminants on human health. The contaminants of potential concern (COPCs) evaluated in the BHHRA were selected by comparing the maximum detected concentration of each analyte in soil with available risk-based screening levels. The selected COPCs included PAHs, PCBs, various pesticides, two explosive compounds, and metals.

Risks calculated in the BHHRA were evaluated to determine the need for a remedial action. For cancer effects, a "cancer risk" was calculated. As an example, a cancer risk of 5 x



10⁻⁶ means a five in one million excess cancer risk for an individual exposed to site COPCs under the conditions assumed in the BHHRA. For noncancer health effects, a "hazard index" (HI) was calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to one) exists below which noncancer health hazards are not expected to occur. Because it represents a threshold, a greater HI is not a measure of a greater effect.

COPCs that exceed a 1 x 10-4 cancer risk or an HI of one typically require a remedial action at the site. If remediation were required, the remediation goals would be set with consideration of the CERCLA acceptable cancer risk limit of 1 x 10-4 to 1 x 10-6, which corresponds to a one in ten thousand to a one in a million excess cancer risk, and an HI of one for noncancer effects. Note that EPA's cancer risk range is an increased risk of developing cancer, based on a plausible upper-bound estimate of risk, of approximately 1 in 1,000,000 (1E-06) to 1 in 10,000 (1E-04). Risks that exceed this range typically require some type of remedial action, while risks within or below this risk range typically do not. Similarly, an HI is a ratio comparing the estimated exposure to a noncancer toxicity value that represents an exposure level below which deleterious noncancer effects are not expected to occur.

The BHHRA calculated risks for individuals that currently work at or spend time at the C/I Area including groundskeepers, construction/utility workers, indoor workers, and daycare children. The BHHRA assumed that these individuals would also contact the soil in the future. Additionally, the BHHRA evaluated risks to hypothetical future residents (an unlikely scenario) for the purpose of assessing an unrestricted use alternative.

The BHHRA concluded that, even with the inclusion of the hypothetical future residents,

the potential exposure and consequent risks to adults and children using or potentially using the area, both currently and in the future, are not a concern for restricted or unrestricted uses. That is, the estimated site cancer risks were less than 1×10^{-4} and the noncancer HIs were less than one. This conclusion is based on all chemical data available to define the nature and extent of soil contamination within the C/I Area. Therefore, No Further Action is proposed for soil contamination associated with the C/I Area.

For the limited areas with potential ecological receptor exposures, concentrations and risks were either below a level of concern or similar to background, and potential ecological effects could not be attributed to former DOD activities at the Raritan Arsenal.

Technology Evaluation

What is a Feasibility Study (FS)?

A Feasibility Study is an engineering study of the potential cleanup remedies for a site. The BHHRA concluded that risks to individuals potentially exposed to soil are not a concern for restricted or unrestricted use. Thus, CERCLA guidance does not require an FS for the residual DoD soil contamination at the C/I Area.

Next Steps

What happens next?

The Corps will conduct a public meeting on December 5, 2019, at the Edison Senior Citizen Center (2963 Woodbridge Avenue, Edison, New Jersey). Once the community has reviewed this Proposed Plan, the Corps will consider all comments received from the public. The Corps will provide written responses to all substantive comments and combine them into a Responsiveness Summary, which will be included in the Decision Document for the C/I Area. The Decision Document will describe the No Further Action determination for soil and



summarize community participation in the selection process. The Corps anticipates that the Decision Document will be finalized and signed before the end of 2020, at which time it will be made available to the public and on the Corps' webpage for the former Raritan Arsenal:

http://www.nan.usace.army.mil/Raritan

None of the CERCLA § 121 statutory determinations are necessary because no remedy is being selected.



Glossary of Terms

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA), commonly known as Superfund. The Corps' characterization and remediation at DERP-FUDS sites is conducted in accordance with CERCLA/SARA and funded by DERP.

Corps of Engineers (the Corps): The U.S. Army Corps of Engineers provides comprehensive environmental restoration services for the Army, Department of Defense (DOD), Environmental Protection Agency (EPA), Department of Energy (DOE), and other federal agencies. The DOD has designated the Corps to oversee the environmental program at the Site, under the Formerly Used Defense Site (FUDS) program.

Decision Document (DD): A legal, technical and public document that explains the rationale and remedy decision for a given site. It also summarizes the public's involvement in the decision process.

Feasibility Study (FS): An engineering study of the potential remedies for a site.

Baseline Human Health Risk Assessment (BHHRA): An analysis of the potential adverse human health effects caused by hazardous substance exposure in the absence of any actions to control or mitigate these exposures under current and future site uses.

Remedial Investigation (RI): The collection of data and information necessary to characterize the nature and extent of contamination at a site. The RI also includes information as to whether or not the contamination poses significant risk to human health and/or the environment.



Contact Information

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Information Repositories

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