Final Proposed Plan for the Military Munitions Response Program
Siege Battery–TD River (WSTPT-016-R-01, Site 36993.1039)
Battery Knox–TD River (WSTPT-004-R-01, Site 36993.1036)
U.S. Army Garrison West Point

West Point, New York — November 2023

INTRODUCTION

Bold terms are included in the Glossary of Terms.

The U.S. Department of the Army (Army) identified the following **preferred alternatives** at these two **munitions response sites** (MRSs):

- Siege **Battery**–Transferred (TD) River MRS: *Land Use Controls*
- Battery Knox–TD River MRS: *Land Use Controls*

The MRSs are located adjacent to the U.S. Army Garrison West Point (West Point) within the Hudson River as shown on **Figure 1**. The preferred alternatives are designed to protect human health and the environment from the **explosives safety hazard** posed by **munitions and explosives of concern** (MEC) potentially located at each of the MRSs.

Congress established the **Military Munitions Response Program** (MMRP) in 2001 to evaluate areas used in the past for military training. These areas are known as MRSs. If information indicates that munitions may have been used during training at these MRSs, environmental studies are conducted at the MRSs under the MMRP. The study results are used to determine if MEC and/or **munitions constituents** (MC) are present, and if MEC and/or MC could potentially harm human health and the environment. If there is potential harm, then some type of action may be needed to reduce or eliminate the risk posed by the MEC and/or MC. The decision about the action to take is proposed to the public for review and comment in a **Proposed Plan** like this one. The Army is the lead agency for West Point under the **Comprehensive Environmental Response, Compensation, and Liability Act** (CERCLA), also known as "Superfund." The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) are the supporting **regulatory** agencies.

The Army uses the Proposed Plan to involve the public in the remedy selection process by providing background information regarding West Point and each of the MRSs. It presents why the preferred alternatives were selected and summarizes other remedial alternatives that were considered. This Proposed Plan is being issued as part of the public participation responsibilities under 40 Code of Federal Regulations (CFR) Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan** (NCP) and Section 117(a) of CERCLA. The Army is conducting a public comment period (see box) for this Proposed Plan to encourage public participation in the selection of a **final remedy** for each of the MRSs. Although West Point is not on the CERCLA **National Priorities List**, under the **Defense Environmental Restoration Program**, the Siege Battery–TD River and Battery Knox–TD River MRSs are following the CERCLA process.

MARK YOUR CALENDAR!

The Army will hold a public comment period prior to final remedy selection. During the comment period, your questions or comments on the Proposed Plan and the preferred alternative can be submitted to the Army as noted below:

Public Comment Period:
December 11, 2023 to January 10, 2024

You can comment, in writing, by mail to:
Mr. Paul Dunaev
U.S. Army Garrison West Point
ATTN: AMM-MLP-E
667A Ruger Road
West Point, NY 10996-1592 10996-1592
paul.v.dunaev.civ@army.mil

Comments must be postmarked or e-mailed by midnight on January 10, 2024.

Public Meeting

A public meeting, to explain the Proposed Plan, will be held on December 19, 2023.

Project Information Repository and Other Places to Locate Information

The project information repository contains copies of technical reports and other information available in the Administrative Record prepared for the MRSs. The project information repository is located at the following library:

- Highland Falls Library, 298 Main Street, Highland Falls, NY 10928.

Files have also been placed at the following libraries for review during this public comment period:

- Julia L. Butterfield Memorial Library, 10 Morris Avenue, Cold Spring, NY 10516.
- Desmond-Fish Public Library, 472 Route 403, Garrison, NY 10524.

A copy of the Proposed Plan is also provided online at: https://home.army.mil/westpoint/about/environmental-management-division

This Proposed Plan summarizes information presented in **remedial investigations, feasibility studies**, and other documents located in the **project information repository**. The project information repository (see box for location) contains copies of documents included in the **Administrative Record** (see Glossary of Terms for location).

The Army will select a final remedy for each of the MRSs after reviewing and considering all information received during the public comment period. Based on new information or public comments, the Army may change the preferred alternatives identified in this Proposed Plan. Therefore, the public is encouraged to review and comment on all of the remedial alternatives presented in this Proposed Plan. Information about how to submit comments is presented in the "Community Participation" section of this Proposed Plan.

After the public comment period, the Army will prepare a **Decision Document** describing the final remedy for each of the MRSs. All significant comments received during the public comment period will be considered and responded to in the **Responsiveness Summary** of the Decision Document.

SITE BACKGROUND

West Point is located in Orange and Putnam Counties, New York, on the Hudson River. West Point is approximately 50 miles north of New York City and approximately 13 miles south of Newburgh. In its entirety, West Point encompasses 15,974 acres and is composed of three areas: the Main Post, Constitution Island, and the West Point Military Reservation (**Figure 1**). The Main Post includes the majority of the academic, residential, and support facilities. Constitution Island is heavily forested and designated as a special natural area by West Point. Facilities on the island include a caretaker's house, the historic Warner House, boat dock, gardens, education facility, trails, and Revolutionary War fortifications. The Military Reservation is largely undeveloped and contains operational training facilities, including **firing ranges** and bivouac temporary camps used during the summer to train and house cadets.

The Siege Battery–TD River and Battery Knox–TD River MRSs are located east of West Point within the Hudson River (**Figure 1**). The MRSs include the portion of the Hudson River that was targeted by a series of batteries firing artillery during training throughout the Revolutionary War. Artillery firing at barges in the river (located within the two MRSs; exact locations unknown) during training continued until World War II. The batteries overlapped, and military munitions items may be present within the MRSs from the multiple ranges targeting barges in the Hudson River, undershots from targeting Constitution Island, as well as overshots and undershots from targeting Crow's Nest Impact Area (see **Figure 2**).

SIEGE BATTERY–TD RIVER MRS HISTORY

The Siege Battery–TD River MRS is a 1,205.81-acre portion of the Siege Battery firing fan that falls within the Hudson River. The Siege Battery was constructed around 1845 on the site of Battery Sherburne at what is now called Trophy Point. Battery Sherburne was built in 1778 and contained two iron 6-pounder cannons (i.e., 6-pounders) on garrison carriages and eight iron 6-pounders on stocked or field carriages. Six-pounders fired solid metal artillery munitions that did not contain any explosive material. Activities that took place at West Point that are associated with the Siege Battery–TD River MRS included an ammunition storage area and live firing conducted from the Siege Battery toward potential targets located in the Hudson River and on Constitution Island and Crows Nest.

Various munitions were used at the Siege Battery, including 4.5-inch rifled guns, 30-pounder Parrott guns, 10-inch smooth bore siege mortars, 8-inch smooth bore siege mortars, 5-inch steel breech-loading guns, 7-inch steel breech-loading howitzers, 7-inch steel breech-loading mortars, and 3.2-inch guns. The targets for the Siege Battery guns were located on Crows Nest, approximately 2,000 yards away. Full charges were not used in any of the guns. The targets for the mortars were anchored in the Hudson River. Use of the Siege Battery ended between 1906 and 1910. During the latter part of the 19th century, the Siege Battery was renamed Battery Schofield and was used for training with Parrott guns. A map from 1939 indicates that the firing points for the Siege Battery and Battery Schofield had been replaced by an amphitheater.

BATTERY KNOX–TD RIVER MRS HISTORY

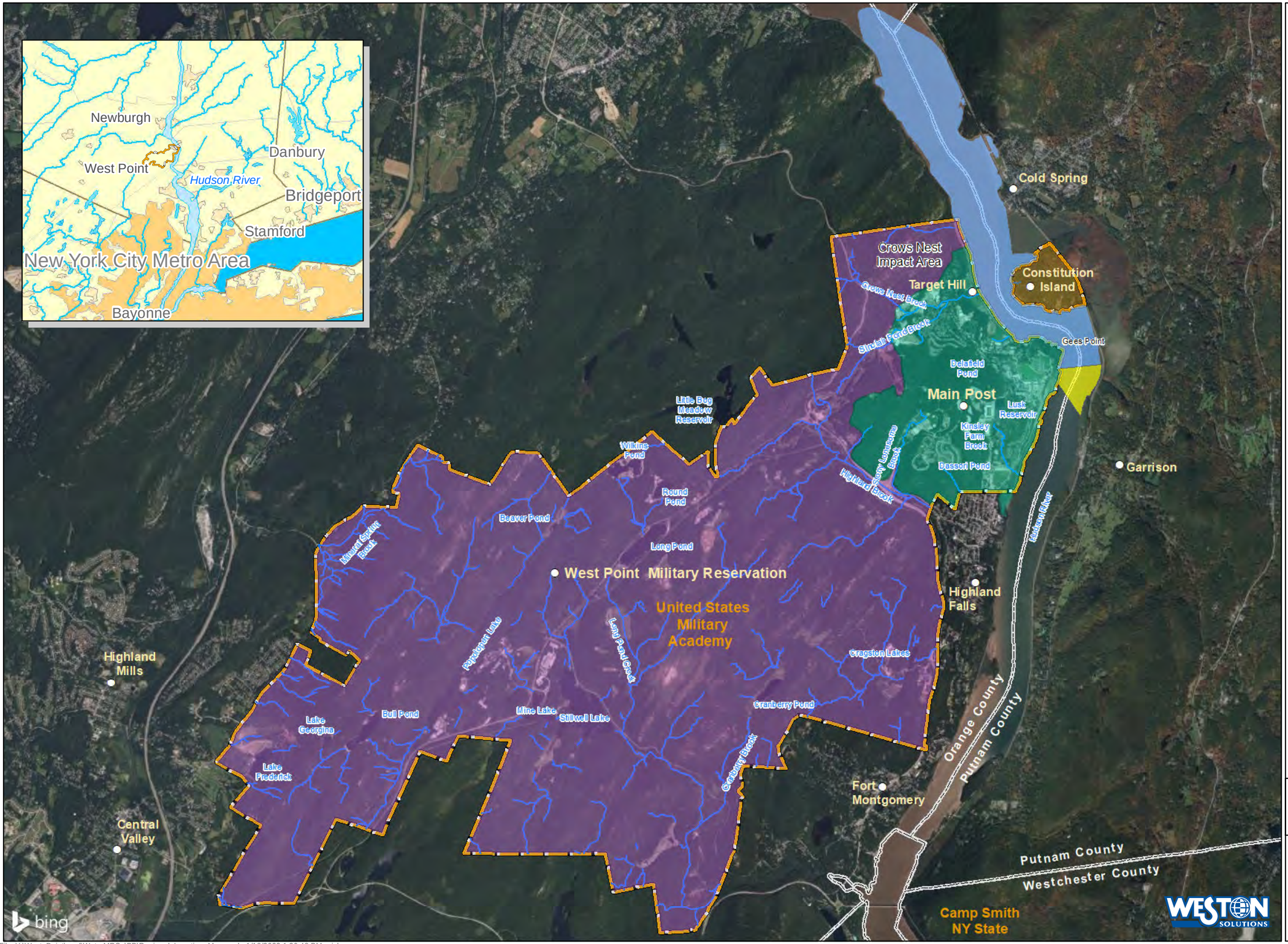
The Battery Knox–TD River MRS is a 73-acre portion of the Battery Knox range fan that falls within the Hudson River. Battery Knox contained six gun positions and ammunition magazines. The battery was established sometime between 1836 and 1850. In 1874, the battery was redesigned, with modifications made to the armament and the orientation of the guns to improve their defensibility and their ability to cover the river with firepower.

By 1892, Battery Knox was armed with one 100-pounder Parrott 6.4-inch caliber gun, one 300-pounder Parrott 10-inch caliber gun, one 8-inch converted gun, and four 10-inch Rodman guns. Firing from the battery was conducted to the east towards targets that were placed in the Hudson River. The battery was demolished during the World War II era.

PREVIOUS INVESTIGATIONS

A marine **site inspection** (SI) was conducted for the MRSs in the Hudson River between 2014 and 2016 to investigate the presence or absence of MEC in the center channel of the Hudson River and to provide data for follow-on efforts. The SI consisted of a series of surveys that employed a variety of **remotely operated vehicles** equipped with specially designed sensors capable of detecting metal in the Hudson River that could be munitions. Approximately 80 features of interest in the Siege Battery–TD River MRS and 36 features of interest in the Battery Knox–TD River MRS were identified. Of these, three areas were identified for further investigation as potential areas of interest where **anomalies** resembling military munitions were identified. Based on the marine SI results, it was suggested that additional CERCLA investigations be conducted for the MRSs.

Between 2018 and 2019, remedial investigation (RI) field activities were conducted at the MRSs. Various surveys were performed to assess the nature and extent of MEC. A total of 4,231 anomalies were discovered, and 150 (143 dive locations and 7 locations to be inspected using a remotely operated vehicle) were selected for further investigation. However, because of a dive emergency, only 15 of the 143 dive anomalies were intrusively investigated. No evidence of MEC was identified in the 15 anomalies intrusively investigated prior to the diving incident. The intrusive investigation was revised to a **handheld metal detector investigation** of an area totaling 93.48 acres where humans had the highest potential to come into contact with MEC in the water. All anomalies encountered were intrusively investigated. One **munitions debris** (MD) item was identified, and the remaining anomalies were determined to be non-munitions-related debris.



Legend

- Installation Boundary
- Streams
- Battery Knox - TD River
- Siege Battery - TD River
- Constitution Island
- Main Post
- West Point Military Reservation

Imagery Source: ESRI, Bing Mapping Service; 2021

N
W E
S

0 1 2
Miles

Figure 1
Regional Location Map
U.S. Army Garrison West Point

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Items Identified During the Crows Nest Remedial Investigation

Anomaly Type
- Munitions Debris
- Anomaly (Not Investigated)
- Munitions Pile

UXO/MPPEH
- M1907 PTTF
- M3 PD Fuze
- Parrott Base Fuze
- M48 HE Fuze
- M4 HE Booster
- Unknown Booster
- 4.7-in Projectile HE
- 6-in Common HE
- 75mm Mk 1 Shrapnel
- 75mm M48 HE
- 155mm Mk 1 HE

SIEGE BATTERY - TD RIVER
WSTPT-016-R-01

BATTERY KNOX - TD RIVER
WSTPT-004-R-01

Legend
- Installation Boundary
- Storm King - Crows Nest FUDS Area
- Battery Knox - TD River
- Siege Battery - TD River
- Constitution Island
- Main Post
- West Point Military Reservation
- Crow's Nest Impact Area
- Former Range Fans
- Firing Points
- MEC Related Items Found by Parsons

Notes:
PTTF: powder train time fuze
HE: high explosive
PD: point detonating

Imagery Source: ESRI, Bing Mapping Service; 2016

0 0.5 1 Miles

Figure 2
MRS and Range Firing Fans Locations
U.S. Army Garrison West Point

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The Army's findings in the RI conducted at the MRSs were as follows:

- One MD item was found in the sediments at Siege Battery–TD River MRS.
- MEC was not found; however, MEC has been identified within approximately 100 feet (ft) of the shoreline on both sides of the river. The Constitution Island caretaker reported observing MEC along the bank of Constitution Island that could migrate into the MRSs during storm events. MEC has also been identified within the Crow's Nest Impact Area near River Road (**Figure 2**).
- Because no concentrated areas of MD or MEC were identified, no **source** for MC is present in the MRSs, and the **exposure pathways** for MC were determined to be incomplete.

The Army recommended that a feasibility study be prepared to evaluate future actions for the MRSs because MD was found in the sediments and along the shorelines near the MRSs.

SITE CHARACTERISTICS

The Hudson River is a 315-mile river that flows from north to south in the non-tidal portion of the river. The river originates in the Adirondack Mountains of Upstate New York, flows through the Hudson Valley, and eventually drains into the Atlantic Ocean, between New York City and Jersey City. The tidal portion between the Federal Troy Dam and NY Harbor (approximately 153 miles) is tidally influenced and has an average tidal range of 4 ft. There are two high tides and two low tides in a 25-hour period.

The river depth varies from very shallow (1 to 4 ft) near the shorelines to an average depth of 60 ft in the Siege Battery–TD River MRS main channel and an average depth of 90 ft in the main channel of the Battery Knox–TD River MRS. The Hudson River has a maximum depth in the MRSs at mean low tide of approximately 175 ft. Much of the eastern shoreline consists of gradual slopes with some steep slopes near Little Stony Point and from Constitution Island south. Steep slopes were identified along the western shoreline. The deepest survey depths were observed in the center of the navigation channel where the river narrows and bends south of Constitution Island.

The Hudson River experiences tidal fluctuations of nearly 4 ft. The current flows in both directions as a result of flood and ebb tides with currents averaging 1.1 to 1.5 knots with the potential of up to 4 knots.

A data evaluation was performed that included a MEC migration study. The information was used to evaluate the potential for MEC to move horizontally and vertically within the MRS based on the characteristics of the Hudson River in this location as well as on the size and shape of the MEC items present. Based on this evaluation, it was concluded that horizontal movement of MEC could occur in areas with little sedimentation (regardless of bottom slope) as well as areas with moderate to steep slopes regardless of the amount of sedimentation present. In areas where there is sedimentation and relatively flat bottoms, MEC would be anticipated to settle into the sediments rather than migrate. Horizontal movement of MEC could potentially occur due to tidal action, but more so due to gravity. MEC would not be anticipated to migrate upslope with tides.

The weight of the MEC items present may also prevent movement, other than in areas with steep slopes. The items potentially present range in weight from 5 pounds (lb) 7 ounces to 352 lb. The majority of MEC items found on land range from 11 lb 3 ounces (75-millimeter **projectile**) to 50 lb (8-inch mortar) up to 150 lb (8-inch solid shot cannonball). The smaller of these items would be more likely to move with the tides, whereas the larger items would be more likely to sink into sediments. Due to the size and weight of the MEC items used at the MRSs, migration of MEC within the mud and sand of the sediment layer may occur until a hard pack or rock layer is reached. This thickness varies within the MRSs from 0- to 4-ft below ground surface (bgs). Therefore, MEC may be present from 0- to 4-ft bgs.

Once MEC has settled into the deeper areas or in shallow areas where the bottom is too flat to allow significant movement by tidal action due to the weight of the items, MEC items may lie on the sediment surface. In these locations, MEC is more likely to be contacted by anchors, divers, other recreational users, or industrial users. During the diving investigations, silty clay sediments were observed. The depth of the sediments ranged from 1 ft to greater than the reach of the diver's arms. This type of sediment would promote in-place scour and burial of MEC, making contact less likely based on sediment condition and type.

West Point and Storm King State Park are located to the west of the MRSs. East of the MRSs is the Village of Cold Spring, NY, as well as several recreational areas, such as Constitution Island, which is part of West Point. CSX and Metro-North Railroad lines completely skirt the western and eastern shores of the river adjacent to the MRSs. The Hudson River is used for maritime trade, recreation, and underwater utilities.

Numerous recreational activities occur within the MRSs, including recreational boating (e.g., kayaking, canoeing, and paddle boarding), fishing, swimming/wading, and scuba diving. Several kayak access points and boat docks are located within or adjacent to the MRSs (see **Figure 3**). Several fishing locations are also within or adjacent to the MRSs, including the shoreline adjacent to Cold Spring, the middle of the river just north of Little Stony Point, and a number of locations surrounding Pollepel Island (see **Figure 3**).

Swimming/wading can happen anywhere access is unrestricted along the Hudson River. Popular swimming/wading areas are located on the northern side of Little Stony Point and along the shoreline of Cold Spring (see **Figure 3**). Although not prohibited, swimming in the remainder of the MRSs is not anticipated to occur, or to occur very infrequently, due to river depths and bank conditions. Fishing, swimming/wading, and scuba diving are likely to occur closer to the banks, whereas boating is more likely to occur in deeper areas of the river except for entry and exit locations.

Pollepel Island
Metro-North Railroad
Breakneck Point/
Breakneck Ridge Trail
SIEGE BATTERY - TD RIVER
WSTPT-016-R-01
Little Stony Point
Little Stony Point
Citizens Association
Mayor's Park/
Ballfield
Cold Spring
Public Works Facility
Cold Spring WWTP
CSX Railroad
Dockside Park
Riverfront Park
Storm King/Crows Nest
FUDS Area
Cold Spring
Boat Club/Marina
Cold Spring
M-N Railroad
Cold Spring Station
Chapel of Our Lady Restoration Site
West Point Foundry Preserve/
Foundry Cove
Foundry Dock Park
Target Hill
Wastewater Treatment Plant
Constitution Island
Constitution Marsh
Audubon Center
and Sanctuary
CSX Tunnel Entrance
North Dock
BATTERY KNOX - TD RIVER
WSTPT-004-R-01
Lusk
Reservoir
Garrison Marina
South Dock
M-N Railroad
Garrison Station
United States
Military
Academy
Garrison
CSX Railroad
Metro-North Railroad
Imagery Source: ESRI, Putnum County Orthos Mapping Service, 2021

Legend

- Installation Boundary
- Battery Knox - TD River
- Siege Battery - TD River
- Human Receptor Areas
- Boat Access Location
- Kayak Launch Location
- Popular Fishing Spots
- Swimming/Wading Location
- Railroad
- Helipad
- CSX Railroad — Public Infrastructure
- Dockside Park — Public Park/ Recreational Area

N W E S

0 1,800 3,600
Feet

Figure 3
Human Receptor Areas
U.S. Army Garrison West Point

No information on utilities existing within the river was found. Potential future utilities may be installed near or possibly within the MRSs. A plan for a 1,000-megawatt high-voltage direct-current underwater and underground transmission line that would bring an alternate energy source from the U.S.-Canadian border to southeastern New York is currently being developed.

In addition, there are plans to update the West Point Target Hill Wastewater Treatment Plant. This plant is located on the Hudson River shoreline near Shea Stadium. Plans to replace or renovate the plant will require replacing the outfall for the plant. The outfall extends into the river and discharges underwater.

West Point also has plans to repair the failing seawall near North Dock (near the helipad shown on **Figure 3**). The plan West Point is developing to make the repairs would require working in the river.

Based on the site use and the potential location of MEC, the Army identified the following **human receptors** that use the MRSs. Receptors include the following:

- Current and future site workers:
  - Utility workers, transmission line workers, and West Point workers
  - Commercial maritime workers
  - Railroad workers
  - Maintenance workers
  - Construction workers performing dock installation/maintenance and/or upkeep of the shoreline (e.g., inspections, embankment maintenance, and cleanups).
- Recreational users (e.g., fishing, boating, diving, wading, and/or swimming).

These human receptors may come into contact with MEC that might be on or in the sediments of the Hudson River. Typical recreational activities do not penetrate more than 0.5 ft bgs into the sediments. However, dredging and construction activities may intrude deeper into the sediments where MEC is more likely to be found.

"Human receptor areas" are locations where human **interaction** with the Hudson River sediment (hard bottom or soft bottom) is more frequent. Human receptor areas are characterized as shallow water areas that are generally flat bottomed, which can promote either exposure or transport and/or scour/burial of MEC, if present. Human receptor areas have a gentle slope toward the river channel that provides a mechanism for transport. No **concentrated munitions use areas** are associated with human receptor areas. However, MD was found near the western riverbank, indicating a potential presence of MEC in a human receptor area. As discussed, "human receptor areas" have the potential for MEC to stay in place. Activities that occur in these areas that may result in contact with MEC include walking into the water to get into small boats/kayaks, wading during fishing, and swimming. These activities seem to be primarily limited to the areas around Cold Spring, NY, near Little Stony Point, south of Constitution Island to Battery Knox, around North Dock, and close to Lusk Reservoir, and include shallow water areas accessible to the public. The human receptor areas are shown on **Figure 3**.

SCOPE AND ROLE OF REMEDIAL ACTION

This Proposed Plan identifies the Army's preferred alternatives for the two water MRSs described in the previous sections. The Army selected the preferred alternatives as an appropriate **remedial action** to protect human health and the environment at each MRS. The toxicity, mobility, and volume of MEC at the MRSs will be reduced by the Army only when MEC items are unintentionally discovered or if discovered during annual shoreline surface sweeps.

SUMMARY OF SITE RISKS

As part of the RIs for the MRSs, the Army evaluated potential risk to determine the current and future effects of contaminants on human health and the environment from MC and MEC. A baseline risk assessment for MC was not required in the RI because a source of MC was not identified. An assessment of risks associated with explosive hazards was required based on the one MD item found during the RI at the Siege Battery–TD River MRS and the results of the data synthesis evaluation that identified areas where MEC was most likely to be present.

Although no MEC was encountered in the MRSs during the RI, there is a potential for MEC to be present based on observations by the Constitution Island caretaker. The caretaker was interviewed during the RI and confirmed that MEC items have been identified and removed from the shorelines of the Hudson River contiguous to the MRSs.

MEC risks were evaluated using the MEC **Risk Management Methodology**, as issued in the 03 January 2017 United States Army Corps of Engineers Memorandum and extended on 18 March 2020*: Trial Period for Risk Management Methodology at Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) Projects*. The Risk Management Methodology uses a series of matrices to evaluate accessibility, munitions sensitivity, and severity of an explosive event if it were to occur. The purpose of each of the matrices used in the Risk Management Methodology is presented below:

- Matrix 1 – Likelihood of Encounter: Relates the site characterization data for the amount of MEC potentially present to the site use, including accessibility, in order to determine the likelihood of encountering MEC.
- Matrix 2 – Severity of Incident: Assesses the likelihood of encounter from Matrix 1 related to the severity of an unintentional detonation.
- Matrix 3 – Likelihood of Detonation: Relates the sensitivity of the MEC items to the likelihood for energy to be imparted on an item during an encounter by specific land users.
- Matrix 4 – Acceptable and Unacceptable Site Conditions: Combines the results of the above categories to define the risk posed by the explosive safety hazards potentially present. A site that results in an unacceptable initial

condition will proceed to the next phase of the CERCLA response process.

The baseline Risk Management Methodology tables for the MRSs were provided in Appendix B of the Feasibility Study. Based on an evaluation of the conditions in the MRSs and the types of MEC anticipated, the two MRSs received an overall risk evaluation of "Acceptable." An Acceptable rating means the current conditions do not present an unacceptable risk to human receptors under the current use scenarios. This was based on a likely potential for encounter of munitions in the MRSs but an improbable potential that a munition item could detonate based on the types of activities currently occurring because the munitions are located underwater and do not have water-tight firing mechanisms. The munitions would only present a hazard if removed from the water, dried, and manipulated (e.g., burned or crushed). The majority of items present are very large and heavy and thus could not easily be removed from the water by recreational users that may encounter them. However, if it is determined that intrusive activities are being performed in the future where machinery may trench into sediments or remove sediments from the Hudson River within the MRSs, this score would be revised to "Unacceptable." This situation has not been reported to have occurred. However, if activities are proposed that would result in removal of MEC from the MRSs (e.g., dredging), action would be required.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are MRS-specific goals for protecting human receptors from the explosive hazards posed by MEC. MEC does not pose an explosive hazard to the environment, but the MRS-specific goals were created with the environment in mind to avoid actions that might unnecessarily damage natural resources.

The risk to be addressed is that posed by the explosive hazards associated with residual MEC. No MEC was encountered in the MRSs during the RI and no source for MC was identified. However, there is the potential for MEC to be present based on observations of MEC along the shorelines of the MRSs and the finding of one MD item in the Siege Battery–TD River MRS. Users of the Hudson River within the MRSs include current and future site workers (utility workers, transmission line workers, and West Point workers; commercial maritime workers; railroad workers; maintenance workers; and/or construction workers performing dock installation/maintenance and/or upkeep of the shoreline [e.g., inspections, embankment maintenance, and cleanups]); and recreational users (e.g., fishing, boating, diving, wading, and/or swimming). Due to the size and weight of the MEC items used at the MRSs, movement of MEC within the muds and sands of the sediment layer may occur until a hard pack or rock layer is reached. This thickness varies within the MRSs from 0-4 ft bgs. Therefore, MEC may be present from 0-4 ft bgs. Typical recreation activities do not penetrate more than 0.5 ft bgs into the sediments. However, dredging and construction activities may intrude deeper into the sediments.

To protect human receptors, the Army created the following RAO:

- Prevent direct user contact with MEC in surface and subsurface sediments to current and future workers (utility workers, transmission line workers, and West Point workers; commercial maritime workers; railroad workers; maintenance workers; and/or construction workers) and to current and future recreational users. The depth of concern in the sediments is from the sediment surface to a depth of 4 ft.

SUMMARY OF REMEDIAL ALTERNATIVES

The following is a summary of information that was provided in the Feasibility Study for the MRSs.

The Army developed four remedial alternatives in the Feasibility Study that, if implemented, would reduce or eliminate the potential explosive hazard posed by MEC to human receptors. They are presented below:

- Alternative 1: No Action
- Alternative 2: Land Use Controls (LUCs)
- Alternative 3: Underwater MEC Removal Using **Analog Techniques** and LUCs
- Alternative 4: Underwater MEC Removal Using **Digital Geophysical Mapping** (DGM) and LUCs

The alternatives are described in more detail below.

Alternative 1: No Action

*Estimated **Capital Cost**: $0*
Estimated Annual Operations and Maintenance (O&M) Cost: $0
*Estimated **Present Worth Cost**: $0*
Estimated Time to Implement Alternative: Not Applicable
Estimated Time to Achieve RAOs: Not Applicable

This alternative was included for comparison as required by CERCLA and Department of Defense policy. Under this alternative, there would be no **munitions response**.

Alternative 2: LUCs

Estimated Capital Cost: $125,354
- Siege Battery–TD River MRS: $75,177
- Battery Knox–TD River MRS: $50,177

Estimated Annual O&M Cost: $71,150
- Siege Battery–TD River MRS: $44,479
- Battery Knox–TD River MRS: $26,671

Estimated Present Worth Cost: $2,132,977
- Siege Battery–TD River MRS: $1,330,223
- Battery Knox–TD River MRS: $802,744

Estimated Time to Implement Alternative: 2 months
Estimated Time to Achieve RAOs: 2 months

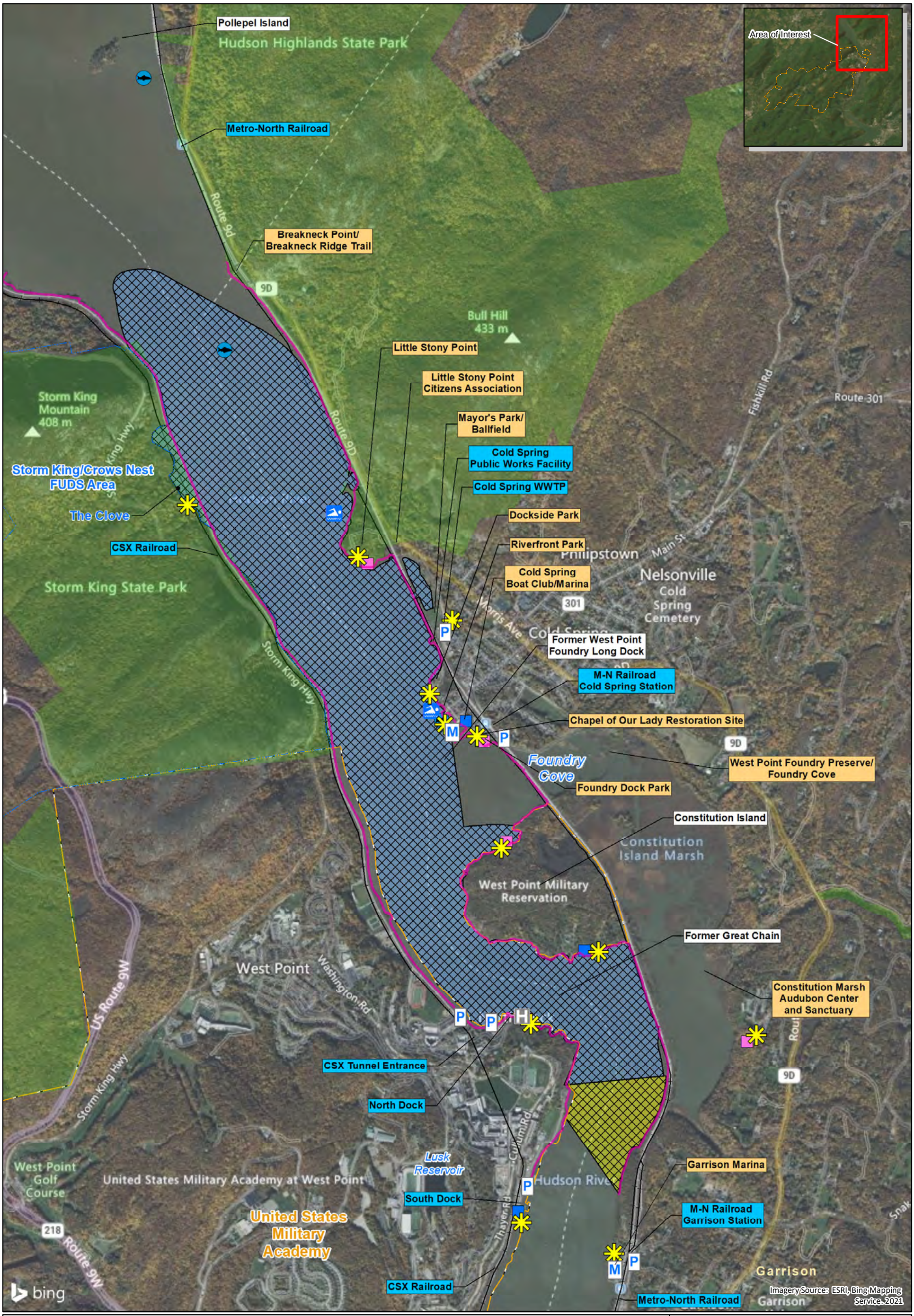
This alternative includes the use of LUCs for both MRSs to reduce the risk of interaction between human receptors and potential explosive hazards posed by MEC. LUC technologies consist of various **engineering controls** (physical barriers) and institutional controls (governmental, proprietary, and educational controls) used to minimize human interaction with

potential residual MEC or other hazards. For LUCs to be effective, stakeholders with jurisdiction must have the ability and interest in supporting the selected LUCs. An Institutional Analysis was conducted during the Feasibility Study to evaluate the ability and willingness of each stakeholder to implement potential LUCs. Based on this evaluation, it was confirmed that engineering controls such as **visual surveys**/shoreline sweeps, **construction support**, and signage and institutional controls such as Recognize, Retreat, Report (3Rs) pamphlets, videos, and other educational materials could feasibly be implemented. These LUCs will require regular inspection (annual or other frequency as appropriate) to determine if they are effective and still in place. The following LUCs make up Alternative 2:

- **Dig Permits**—**Dig permits** are currently required for intrusive work conducted on the MRSs. Laying water lines or fiber optic cables within Cold Spring, Garrison, or West Point (regardless of ownership) requires building and land disturbance permits that are granted by the township in which the work is occurring. If the work requires a backhoe, a permit is required. The NYSDEC requires permits for Excavation & Fill in Navigable Waters – Under Article 15, Title 5. The permitting offices will be informed of the MEC hazards and work to be completed within the MRSs will need to be coordinated with the Army such that appropriate safety measures can be implemented, if required. Intrusive work within the Hudson River requires permitting through the State of New York and coordinated through NYSDEC.
- **Recognize, Retreat, Report (3Rs) Pamphlets, Videos, and Other Educational Materials**—MEC awareness brochures, including the 3Rs procedures, would be placed at recreation area access points and parking lots. Recreational users, employees, and contractors potentially coming into contact with sediments within the MRSs would be offered **MEC awareness training**, including the 3Rs. Other MEC safety training programs can also be implemented as a component of this LUC.
- **Information Boards**—MEC awareness information boards would be placed along the shoreline in the following areas where persons are likely to enter the MRSs:
  - Near the popular swimming/wading areas located on the northern side of Little Stony Point and along the shoreline of Cold Spring.
  - Near Cold Spring and Garrison Marinas.
  - At Cold Spring Dockside Park and Riverfront Park close to the river's edge.
  - At access point to the Hudson within Storm King State Park.
  - Near the West Point docks (North and South docks) at shoreline picnic area, and trails.
  - At kayak launch locations on the east side of the river within the MRS.

  These receptor locations and information boards are shown on **Figure 3** and **Figure 4**, respectively. Information boards would be strategically placed for optimal viewing at these locations to educate recreational users, visitors, trespassers, and site workers of the potential hazards in the Hudson River during swimming, wading, or other activities that may cause users to contact the bottom sediments. The wording for the information boards and their locations would be determined during the design phase.
- **Construction Support**—Construction support would relate to construction activities that resulted in sediments being removed from the Hudson River. Construction workers involved in these activities would contact the West Point Directorate of Public Works to be provided MEC awareness training materials prior to working in the Hudson River. This training would be controlled through the dig permit process. Should a potential MEC item be identified, workers would call 9-1-1 to respond. The responding officers would contact Army Explosive Ordnance Disposal to respond or have the local bomb squad remove MEC items as appropriate. Note that the low probability nature of the site indicates that on-site construction support is not required. However, should munitions be encountered, a review of the probability assessment would be performed, by West Point or a contractor hired by West Point, which may dictate a change to on-site construction support. To provide construction support, **unexploded ordnance** (UXO) technicians will be present and observe construction activities in real-time to identify munitions. If required, the construction support will be documented in separate CERCLA and/or work planning documents as appropriate.

  In addition, two upcoming projects are anticipated to occur near and possibly within the MRSs. These projects are being completed by New York State Energy Research and Development Authority and Champlain Hudson Power Express and could include sediment sampling, dredging, anchoring, or staging of vessels in association with installation of a transmission line. Construction support for these activities may be required and may entail clearance of munitions from the construction footprint prior to installation. Sediment sampling methods will also require evaluation prior to implementation to ensure the removal/movement of MEC during the activities does not occur. Should evidence of a leaking or compromised MEC item be identified, or underwater detonations be required during any future construction support efforts, an evaluation of MC impacts to the surrounding sediments would be warranted. Impacted sediments would be removed as necessary. These construction support activities would be funded by MMRP dollars but are not priced in the FS because the scope and number of instances cannot be identified. Therefore, the costs presented for Alternative 2 do not include construction support, which could be a significant cost, depending on what is required. If required, the construction support will be documented in separate CERCLA and/or work planning documents as appropriate and the costs detailed therein.



Legend

- Installation Boundary
- Storm King - Crows Nest
- Battery Knox - TD River
- Siege Battery - TD River
- Park
- Boat Access Location
- Kayak Launch Location
- Information Boards
- Popular Fishing Spots
- Swimming/Wading Location
- Railroad
- Shoreline Sweep Area
- Area where LUCs are Required
- P — Parking Area
- H — Helipad
- M — Marina
- CSX Railroad — Public Infrastructure
- Dockside Park — Public Park/ Recreational Area

N, W, E, S

0 1,800 3,600
Feet

Figure 4
Alternative 2 Land Use Controls
U.S. Army Garrison West Point

- Shoreline Sweeps—Over time, MEC along the banks is anticipated to continue to migrate to the surface because of weathering, erosion, and frost heave. To account for migration of MEC, visual inspections (extending from the low tide line to 25 ft from the average high tide line) along the shorelines for MEC would be performed annually and after significant storm events, assuming rights-of-entry are obtained from each property owner. Visual inspections will be instrument aided, and MEC will be managed in accordance with explosive safety procedures. Visual surveys will also include inspection of information boards that are accessible by water and that do not require rights-of-entry. These shoreline sweeps will be conducted by a contractor hired by West Point. The total area of visual surveys is 36.27 acres in the Siege Battery–TD River MRS and 3.73 acres in the Battery Knox–TD River MRS.

Alternative 3: Underwater MEC Removal Using Analog Techniques and LUCs

Estimated Capital Cost: $47,448,287

- Siege Battery–TD River MRS: $45,911,189
- Battery Knox–TD River MRS: $1,537,098

Estimated Annual O&M Cost: $71,150

- Siege Battery–TD River MRS: $44,479
- Battery Knox–TD River MRS: $26,671

Estimated Present Worth Cost: $49,455,916

- Siege Battery–TD River MRS: $47,166,251
- Battery Knox–TD River MRS: $2,289,665

Estimated Time to Implement Alternative: 10.5 years

Estimated Time to Achieve RAOs: 10.5 years

This alternative includes the systematic search and removal of all MEC detectable and feasible to remove in the sediments by UXO divers using analog techniques. This alternative includes items lying on the sediment surface that can be visually located, as well as those completely covered with sediment but close enough that they can be detected and removed. The latter would be located using analog geophysical detection instruments.

This alternative focuses on the most accessible MEC in the sediment but does not remove items that may be present deeper than approximately 2 ft below the surface of the sediment. The exposure pathway is incomplete for recreational users at river depths greater than 120 ft because the Department of Defense Manual 4715.20 – Defense Environmental Restoration Program Management states that for areas of the MRS with water depths greater than 120 ft, it will be assumed that a physical constraint/barrier exists to prevent exposure to human receptors. Therefore, removal of MEC from portions of the Hudson River greater than 120 ft bgs would not be performed. In addition, the time the divers spend under water at those depths would need to be limited for safety reasons, making removal from those depths impracticable. Items that are deeper than 2 ft below the surface of the sediment would be difficult to access and identify underwater without dredging sediment in lifts, which is not considered to be implementable.

A total of 1,058.32 acres would require analog clearance in the Siege Battery–TD River MRS, and 27.29 acres would require analog clearance in the Battery Knox–TD River MRS. All underwater MEC removal work would be contracted, overseen, and funded by the Army. The location of the removal action area is shown on **Figure 5**. Although MC was not determined to be a concern at the MRSs, should evidence of a leaking or compromised MEC item be identified or underwater detonations be required during implementation of Alternative 3, an evaluation of MC impacts to the surrounding sediments would be warranted. Impacted sediments would be removed as warranted.

Because MEC would potentially remain at depths below 2 ft from the sediment surface, the LUCs described in Alternative 2 would also be included.

Alternative 4: Underwater MEC Removal Using Digital Geophysical Mapping (DGM) and LUCs

Estimated Capital Cost: $21,263,464

- Siege Battery–TD River MRS: $20,252,181
- Battery Knox–TD River MRS: $1,011,283

Estimated Annual O&M Cost: $70,453

- Siege Battery–TD River MRS: $44,479
- Battery Knox–TD River MRS: $25,974

Estimated Present Worth Cost: $23,251,426

- Siege Battery–TD River MRS: $21,507,244
- Battery Knox–TD River MRS: $1,744,182

Estimated Time to Implement Alternative: 9 years

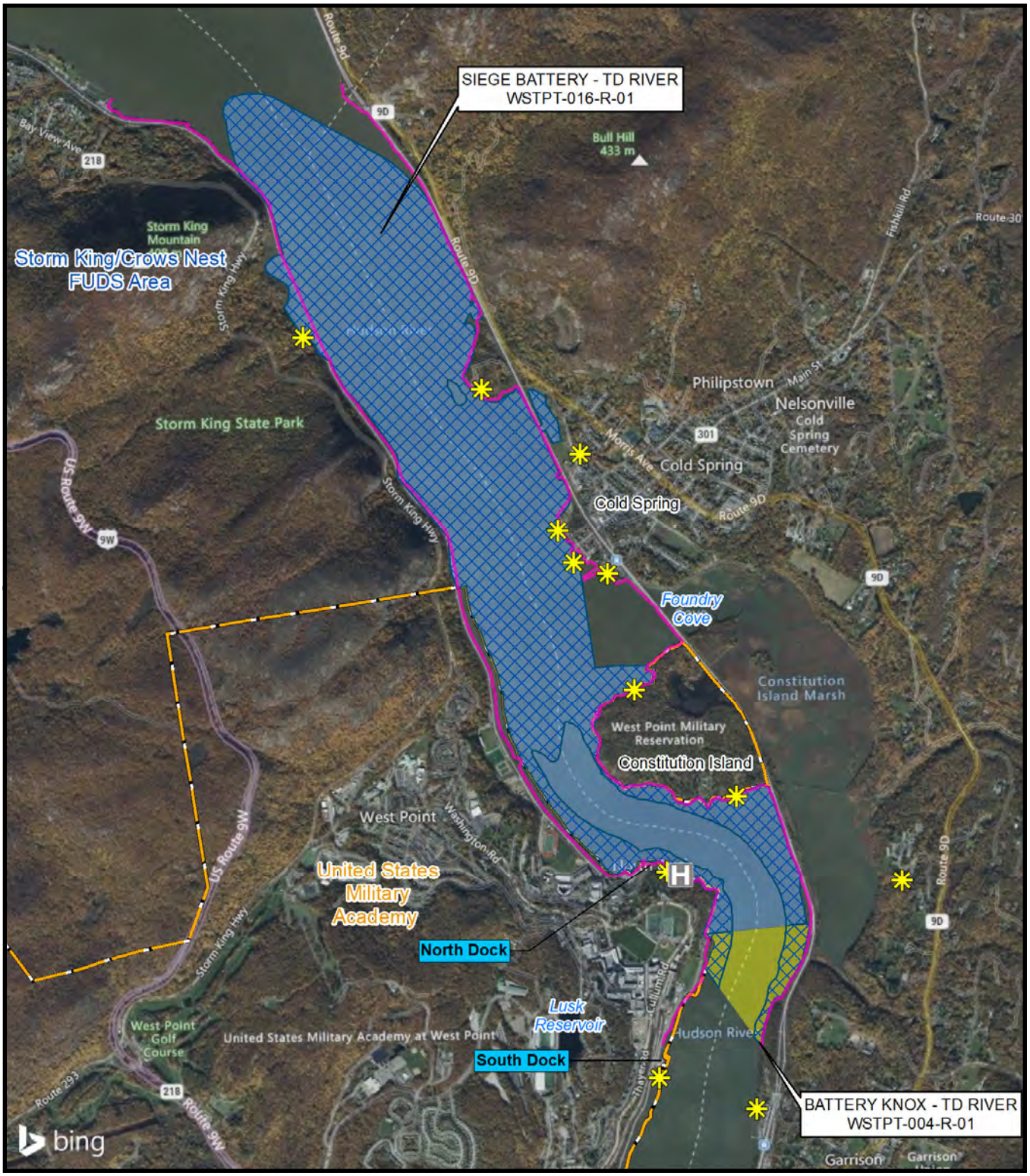
Estimated Time to Achieve RAOs: 9 years

This alternative includes the systematic search and removal of all MEC detectable and feasible to remove in the sediments by UXO divers as described in Alternative 3 and the LUCs described under Alternative 2. However, this alternative utilizes DGM to perform a **geophysical investigation** rather than analog techniques. The use of DGM would result in overall cost savings as the digital **geophysical survey** data collected would identify the specific areas where metallic anomalies exist. Only those locations would have to be investigated rather than performing the full coverage investigations of the sediments by divers that are required for analog surveys. The location of the removal action area is shown on **Figure 5**.

EVALUATION OF REMEDIAL ALTERNATIVES

The following information was provided by the Army in the Feasibility Study for the MRSs. To select the preferred alternative, the Army used nine criteria to evaluate the different remedial alternatives that were developed, both individually and against each other, for the MRSs. The nine criteria are presented in **Table 1**.

The following information summarizes the Army's remedial alternative evaluation.



Legend

- Installation Boundary
- Battery Knox - TD River
- Siege Battery - TD River
- Area Requiring Substrate MEC Removal
- Shoreline Sweep Area
- Information Boards
- Helipad

Imagery Source: ESRI, Bing Mapping Service; 2021

N

0 500 1,000

Meters

Figure 5
Alternatives 3 and 4 Area Requiring MEC Removal and LUCs
U.S. Army Garrison West Point

Table 1 – CERCLA Nine Criteria Summary

Threshold Criteria

1) **Overall Protection of Human Health and the Environment:** Does the alternative protect human health and the environment from the explosive hazards posed by MEC?
2) **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):** Does the alternative comply with the identified ARARs?

For an alternative to be selected, it must meet the two Threshold Criteria.

Balancing Criteria

3) **Long-Term Effectiveness and Permanence:** Is the alternative effective and permanent in addressing the explosive hazards at the site?
4) **Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment:** Does the alternative reduce the toxicity, mobility, or volume of the explosive hazards?
5) **Short-Term Effectiveness:** What is the risk to the community, workers, and the environment during implementation of the remedial action?
6) **Implementability:** How difficult is it to implement the alternative?
7) **Cost:** What are the relative costs associated with the alternative?

The balancing criteria are used to evaluate important differences between the remedial alternatives.

Modifying Criteria

8) **State Acceptance:** Whether the State agrees with the analyses and recommendations, as described in the Remedial Investigation/Feasibility Study and Proposed Plan.
9) **Community Acceptance:** Does the community agree with the analyses and preferred alternative? Comments received on the Proposed Plan are an important indicator of community acceptance.

Modifying criteria will be evaluated in a Decision Document based on any new information and public comments on the Proposed Plan.

- Overall Protection of Human Health and Environment: Alternative 1 – No Action provides no protection of human health and the environment and does not pass the threshold criterion for the protection of human health and the environment. Alternative 2 provides protection through the use of education, training, and surface sweeps of the shorelines to prevent human contact with MEC. Alternatives 3 and 4 provide the greatest protection by removing MEC from the sediments to the extent practicable.

  The Risk Management Methodology for the MRSs indicates that Alternatives 1, 2, 3, and 4 would provide Acceptable end states post-remedy. However, should construction activities be performed that remove sediments from the MRSs, Alternative 1 would result in an Unacceptable end state. Because no action would be implemented under Alternative 1 to control or identify such activities or inform site workers or recreational users of the potential presence of explosive hazards, Alternative 1 has the potential to pose unacceptable risks to human health to future receptors. Therefore, Alternative 1 does not pass this threshold criterion. Alternatives 2, 3, and 4 pass this threshold criterion evaluation at both MRSs.

- Compliance with **Applicable or Relevant and Appropriate Requirements** (ARARs): ARARs are not applicable to Alternative 1 because no action would take place. There are no chemical-specific ARARs associated with the implementation of any of the alternatives. However, one chemical-specific to be considered (TBC) criterion was identified. This criterion is considered protective of ecological and human receptors. Although it is very unlikely MEC has impacted the sediments, if MC above the TBC guidance is identified, and concentrations indicate an unacceptable level of risk, alternatives to address MC may need to be evaluated and may include hot spot removal. Alternatives 2, 3, and 4 comply with the action- and location-specific ARARs and pass this threshold criterion. The ARARs are detailed in the Feasibility Study. The reader is referred to the Feasibility Study for a listing of ARARs.

- Long-Term Effectiveness and Permanence: Alternative 1 does not provide long-term effectiveness or permanence because no remedial actions would be performed. Under Alternative 1, future receptors could potentially be exposed to explosives hazards from MEC if dredging were to occur and sediments were removed from the MRSs.

  Alternatives 3 and 4 provide the most long-term effectiveness and permanence because MEC would be removed from the top 2 ft of the sediments within water depths less than 120 ft under these alternatives. However, MEC would continue to migrate into the MRSs due to erosion of riverbanks. As such, annual visual inspections would be required for all portions of the MRSs where rights-of-entry can be obtained.

  Alternative 2 provides long-term effectiveness through the implementation of LUCs. The water bodies are used recreationally. Future intrusive activities into sediments may occur primarily near piers/docks, near the West Point Wastewater Treatment Plant outfall, and potentially during construction of the high-voltage electric line, should it be constructed through the MRSs. Other than during these activities, hazards can be controlled using the 3Rs (Recognize, Retreat, Report). During construction events, recognition training for workers would be required. Should MEC be observed during construction events, 9-1-1 or the local Army Explosive Ordnance Disposal unit (should MEC be found during Army construction activities) would be called to respond.

  The LUC alternative implemented at the MRSs would be adequate, and reliable control methods to reduce long-term risk associated with potential explosive hazards would include annual visual inspections of shorelines. Annual surface sweeps, enforcement of LUCs, and

five-year reviews would be required under Alternatives 2, 3, and 4 at a minimum of every five years after initiation of the remedial action.

- Reduction of Toxicity, Mobility, or Volume of Contaminants Through Treatment: MEC is not toxic so reduction in toxicity does not apply. Alternative 1 offers no treatment; therefore, it does not provide any reduction in the mobility or volume of MEC in the sediment. Alternative 2 would involve removing MEC during construction activities as well as MEC that is exposed at the shorelines, which is the most likely area where MEC would be exposed and could be contacted by recreational users. Therefore, this alternative would provide a limited reduction in the volume of MEC. Alternatives 3 and 4 remove MEC from the sediments to the maximum extent practicable, providing the greatest reduction in mobility and volume of MEC. Alternatives 2, 3, and 4 satisfy the **statutory** preference for treatment as a principal element to permanently and significantly reduce the volume of MEC.
  Alternative 1 would not reduce the mobility or volume of MEC or satisfy the statutory preference for treatment as a principal element.
- Short-Term Effectiveness: Alternative 1 results in no change to risks to the human receptors or the environment. Short-term risks during the field effort for Alternative 2 are limited to annual inspections for site workers and UXO technicians. These inspections would be performed using anomaly avoidance procedures, and Explosive Ordnance Disposal or the local law enforcement would be contacted to handle any MEC identified. No impact to the community would occur during these activities.

  For Alternatives 3 and 4, during the underwater MEC substrate clearance field effort, there are short-term risks of drowning or injury for the UXO divers. Standard dive practices and the use of personal protective equipment will be followed to minimize these risks. Bottom time for divers would be continually reduced the deeper the divers progress.

  Other risks to site workers are associated with identification and destruction of MEC items. However, adherence to MEC safety requirements would minimize risks to the local community and UXO technicians associated with potential handling of MEC items. UXO safety requirements provide controls to be implemented during handling of MEC, which include provisions for **exclusion zones** around MEC items during detonation operations. The requirements also include practices for protection of the UXO technicians. Therefore, the possibility of contact between humans and MEC and the associated MEC hazards would be minimized by maintaining the access controls during MEC transportation and detonation and by following MEC safety procedures.

  Minimal impact to the community would occur during these activities. During diving operations, the water column provides an engineering control**.** Thus persons would be restricted only from the immediate area around the dive boat/dive team for diver safety purposes (50 ft). Diving would be reduced through the use of DGM for Alternative 4, reducing impacts to recreational and commercial users of the Hudson River.

  Only minimal impacts to the environment or cultural resources are associated with Alternative 2. These impacts would occur only during detonation activities, which would occur on land and be minimized through the use of engineering controls (limited to a 4-ft radius of the item).

  For Alternatives 3 and 4, based on input from NYSDEC, NYSDOH, State Historic Preservation Office, and U.S. Fish and Wildlife Service during the RI, there are minimal impacts to cultural or natural resources, unless **blow-in-place** is required. Vegetation removal will not be required, and damage to biota would be minimal from diving and movement of sediments. However, underwater detonation of MEC would cause significant impacts to biota in the surrounding area as well as to cultural resources, if present. Review of the types of munitions present indicates it is unlikely that identified MEC will be unacceptable to move; therefore, impacts to biota or cultural resources are not anticipated.
- Implementability: Alternative 1 would be technically and administratively feasible to implement. Alternatives 2, 3, and 4 are implementable, with labor, materials, and specialists readily available to implement Alternatives 3 and 4. There may be implementation challenges at the MRSs because they are used often for recreation and have heavy boat traffic by barges and other large vessels. However, the stakeholders have indicated that they support remediation; therefore, it was concluded that Alternatives 3 and 4 are implementable.
- Cost: Alternative 1 is the least costly option, followed by Alternative 2. For both MRSs, Alternative 3 involves the highest cost, with Alternative 4 being less expensive than Alternative 3.

The results of the remedial alternative evaluation conducted by the Army are summarized in **Table 2**. Of these evaluated remedial alternatives, the Army identified Alternative 2 as the preferred alternative. The final remedy will be selected based on the results of the Army's evaluation and any public comments received on this Proposed Plan during the public comment period.

PREFERRED ALTERNATIVE

Alternative 2, LUCs, is the Army's preferred alternative for the Siege Battery–TD River MRS and Battery Knox–TD River MRS. Alternative 2 is preferred by the Army because it will reduce the potential explosive hazard posed to human receptors by MEC and will allow for the current and future land use zoning, which consists of the recreational, commercial, industrial, and construction activities within the Hudson River. Alternative 2 is also preferred by the Army because it is easily implemented, effective in the short-term, and cost effective.

Table 2 – Alternative Evaluation Summary for the Siege Battery–TD River MRS and Battery Knox–TD River MRS

	NCP Evaluation Criteria	Alternative 1 – No Action	Alternative 2 – LUCs	Alternative 3 – Underwater MEC Removal Using Analog Techniques and LUCs	Alternative 4 – Underwater MEC Removal Using DGM and LUCs
Threshold Criteria	Overall Protection of Human Health and the Environment	Fail	Pass	Pass	Pass
	Compliance with ARARs	Pass	Pass	Pass	Pass
Balancing Criteria	Long-Term Effectiveness and Permanence	1	2	4	4
	Reduction in Toxicity, Mobility, or Volume of Contaminants Through Treatment	1	2	4	4
	Short-Term Effectiveness	4	3	1	2
	Implementability	4	3	1	1
	Costs – Siege Battery–TD River MRS	4 ($0)	3 ($1,330,223) (c)	1 ($47,166,251)	2 ($21,507,244)
	Costs – Battery Knox–TD River MRS	4 ($0)	3 ($802,744) (c)	1 ($2,289,665)	2 ($1,744,182)
Modifying Criteria	State Acceptance	Letter of concurrence issued June 7, 2023.			
	Community Acceptance (a)	To be determined			
	Total Score (b)	Fail	16	12	15

Notes:
Ratings: Threshold criteria are pass/fail. Balancing criteria analyses are scored from 1 to 4, where a score of 1 indicates least favorable and a score of 4 indicates most favorable. These ratings are intended to show the relative performance of each alternative against the others and are not a quantitative assessment of performance.
a. The modifying criteria of community acceptance will be determined following review and input from these parties.
b. A total score is provided for alternatives that pass the threshold screening criteria to assess the overall relative performance of the remedies, where the highest score reflects the most favorable remedy.
c. Alternative 2 includes construction support activities that would be funded by MMRP dollars but are not priced in the FS because the scope and number of instances cannot be identified. Therefore, the costs presented for Alternative 2 do not include construction support, which could be a significant cost, depending on what is required.

Based on information currently available, the Army, as the lead agency, believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. The Army expects the preferred alternative to satisfy the following statutory requirements of CERCLA §121(b) and CERCLA §121(d)(2): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost-effective; and (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

COMMUNITY PARTICIPATION

Detailed information regarding the Army's preferred alternative for the MRSs is available in the Administrative Record or in the project information repository located at the following library:

- Highland Falls Library, 298 Main Street, Highland Falls, NY 10928.

Files have also been placed at the following libraries for review during this public comment period:

- Julia L. Butterfield Memorial Library, 10 Morris Avenue, Cold Spring, NY 10516.
- Desmond-Fish Public Library, 472 Route 403, Garrison, NY 10524.

An announcement of the availability of this Proposed Plan was published by the Army in the *Putnam County News and Recorder*, *News of the Highlands*, and the *Times Herald-Record*, and the West Point *Pointer View*, in accordance with CERCLA requirements.

The Army is seeking comments on the preferred alternatives in this Proposed Plan. The public comment period is open from December 11, 2023 to January 10, 2024. All significant comments received by the Army will be considered before a final remedy is selected for the MRSs. In addition, **a public meeting will be held at Desmond-Fish Public Library, 472 Route 403, Garrison, NY 10524, on December 19, 2023, at 5:30 pm**. The Army has included a comment form at the end of this Proposed Plan to submit input on this Proposed Plan.

Contact Information:
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667A Ruger Road
West Point, NY 10996-1592

GLOSSARY OF TERMS

Administrative Record	A collection of the documents used to make a decision on the selection of a remedial (cleanup) action under CERCLA. The Administrative Record contains the information and reports generated throughout the entire investigation and site remediation (cleanup). The Administrative Record is to be available for public review and a copy maintained near the MRS. The official Administrative Record for the two MRSs is located in Building 667, within the Environmental Engineering Branch, and is maintained by the Army. The point of contact for the Administrative Record is Mr. Paul Dunaev (667A Ruger Road, West Point, New York 10996-1592).
Analog Techniques	A process in which a handheld device is used to alert an operator to metal objects below the ground surface with a visible or audio signal.
Anomalies	Items detected below ground with a handheld metal detector or by a geophysical survey; items could be munitions debris or MEC.
Applicable or Relevant and Appropriate Requirements	Those federal and more stringent state requirements that a selected remedy will attain. These requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address circumstances at a CERCLA site. These requirements may vary among sites and response actions. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.
Battery	A unit of guns, cannons, rockets, or missiles grouped together to make their use easier and more effective.
Blow-in-Place	Method used to destroy unexploded ordnance, by use of explosives, in the location in which the item is encountered.
Capital Cost	A fixed one-time expense incurred for the purchase of equipment and/or services during the installation of a final remedy.
Comprehensive Environmental Response, Compensation, and Liability Act	Commonly known as Superfund; CERCLA was enacted by Congress on December 11, 1980, and modified in 1986 by the Superfund Amendments and Reauthorization Act. CERCLA authorizes federal action to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.
Concentrated Munitions Use Area	Areas within an MRS where there is a high likelihood of finding MEC and that have a high amount of MD because of historical munitions use and fragmentation (EM 200-1-15).
Construction Support	A requirement when conducting work below the ground at an MRS where there is a low probability of finding MEC. Specially trained workers must be made aware of the below ground work and available to go to the MRS if suspected MEC is found. These workers are trained to safely identify and destroy MEC when found.
Decision Document	The Department of Defense has adopted the term Decision Document to refer to a legal public document, similar to a Record of Decision completed for National Priority List sites. The Decision Document certifies that the remedial action selection process was carried out in accordance with CERCLA, and to the extent practical, the NCP; provides a substantive summary of the technical rationale and background information in the Administrative Record; provides information necessary in determining the conceptual engineering components to achieve the remedial action objectives established for an MRS. The Decision Document serves as a key communication tool for the public that explains the identified hazards that the selected remedial action will address and the rationale for remedial alternative selection. The Decision Document will be maintained in the Administrative Record.
Defense Environmental Restoration Program	This program manages the Department of Defense's environmental restoration program for active, closed, or closing installations. It provides for the identification, investigation, and removal of contamination and military munitions associated with past activities at Department of Defense facilities to ensure potential threats to public health and the environment are appropriately assessed and addressed.

Dig Permit	A permit required when conducting work below ground at West Point. These permits are reviewed by West Point to determine if an explosives safety hazard exists at the location where below ground work is being conducted.
Digital Geophysical Mapping	Process that uses a metal detection system to digitally record data about the location of metal below the ground surface.
Engineering Controls	Physical item or items, such as sand bags, designed to protect workers from the explosive hazards posed by MEC.
Exclusion Zone	An area that is established around an activity that may accidentally result in the detonation (explosion) of MEC to prevent harming people not directly involved in the activity. The size of the exclusion zone is based on the munition or munitions that have been found or are suspected of being present within the area where the activity is occurring.
Explosives Safety Hazard	The probability (likelihood) for MEC to detonate (explode) and potentially cause harm to people, property, or the environment as a result of human activities. An explosives safety hazard exists if a person can come into contact with a MEC item and cause it to detonate or explode. The potential for an explosives safety hazard depends on the presence of three critical elements: a source (presence of MEC), a human receptor or person, and an interaction between the source and the human receptor (such as picking up the item or disturbing the item by plowing). There is no explosives safety hazard if any one element is missing.
Exposure Pathway	An exposure pathway refers to the way a person can come into contact with a hazardous substance. There are three basic exposure pathways: inhalation, ingestion, or direct contact. The degree or extent of exposure is determined by measuring the amount of the hazardous substance at the point of contact. For MEC, only direct contact exposure pathways have the potential to cause harm.
Feasibility Study	A study required for the CERCLA process that identifies and evaluates remedial alternatives for an MRS. The remedial alternatives are composed of remedial actions and are designed to protect people from harm at an MRS.
Final Remedy	The final remedial action selected by the lead agency for a site after reviewing and considering all information submitted during the 30-day public comment period, which will be documented in a Decision Document or Record of Decision (NCP 40 Code of Federal Regulations [CFR] §300.430(f)(4)(i)).
Firing Range	An area associated with munitions training where MEC may be present.
Five-Year Review	Required by CERCLA or program policy when hazardous substances remain on-site above levels that permit unrestricted use and unlimited exposure. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. Reviews take place five years following the start of a CERCLA response action and are repeated every five years as long as future uses remain restricted.
Geophysical Investigation	An activity conducted by specially trained workers using specialized equipment designed to detect anomalies located below ground. The located anomalies are evaluated with specialized software to create a dig list of anomalies that require additional investigation. The anomalies on the dig list are exposed for investigation with hand tools or a combination of mechanized equipment and hand tools. The status of the exposed anomaly, e.g., cultural debris, material potentially presenting an explosive hazard, munitions debris, or MEC, is determined by a specially trained worker. Depending on the status of the exposed anomaly, it may be detonated in-place or removed for disposal without deactivation.
Geophysical Survey	An activity conducted by specially trained workers using specialized equipment designed to detect anomalies located below ground.

Handheld Metal Detector Investigation	An activity conducted by specially trained workers using equipment designed to detect munitions debris and MEC on the ground and anomalies below the ground. Any located munitions debris is removed for disposal. Any located anomalies are exposed for investigation with hand tools or a combination of mechanized equipment and hand tools. The status of the exposed anomaly, e.g., cultural debris, material potentially presenting an explosive hazard, munitions debris, or MEC, is determined by a specially trained worker. Depending on the status of the exposed anomaly, it may be detonated in-place or removed for disposal without deactivation.
Human Receptor	Includes people, such as homeowners or workers, that may be harmed by contacting munitions constituents or MEC. For example, homeowners may be harmed when they pick up a MEC item or drink water with munitions constituents in it.
Interaction	One of three elements required for an explosives safety hazard to exist. An interaction is an activity conducted by a human receptor that puts them in contact with a source (MEC), such as walking, digging a garden, or repairing an underground utility.
Military Munitions Response Program	A program developed by the Department of Defense to address munitions-related concerns, including explosive safety, and environmental and health hazards from MEC at locations other than operational ranges on active installations such as West Point and on closed installations.
Munitions Constituents	Any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 United States Code [USC] 2710(e)(4)).
Munitions Debris	Pieces and parts of munitions (e.g., fragments, projectiles, shell casings) that remain after munitions have broken apart or exploded.
Munitions and Explosives of Concern	This term includes specific types of military munitions that may pose unique explosives safety risks, including unexploded ordnance as defined in 10 USC 101(e)(5)(A) through (C) and 40 Code of Federal Regulations [CFR] 266.201, discarded military munitions as defined in 10 USC 2710(e)(2), and munitions constituents - explosives such as trinitrotoluene present in high enough concentrations to pose an explosive hazard as defined in 10 USC 2710(e)(3).
Munitions and Explosives of Concern Awareness Training	This is training provided to workers conducting below ground work at an MRS where there is a low probability of finding MEC. This training will help workers identify suspected MEC and tell them what to do if they find suspected MEC.
Munitions Response	This is another term for a remedial action, but is more specific to the activities conducted at an MRS to reduce or eliminate the explosive hazards posed to human health and the environment by MEC.
Munitions Response Site	A specific area on a defense site known or expected to contain munitions requiring investigation to determine whether munitions or munitions constituents are present.
National Oil and Hazardous Substances Pollution Contingency Plan	The federal regulation that implements CERCLA. The NCP was revised in February 1990. The purpose of the NCP is to provide the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, or contaminants.
National Priorities List	The list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The National Priorities List is intended primarily to guide the U.S. Environmental Protection Agency in determining which sites warrant further investigation.
Preferred Alternative	The remedial alternative selected by the Army and presented in the Proposed Plan that would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and would utilize solutions and alternative treatment technologies to the maximum extent practicable. The preferred alternative can change in response to public comment or new information.
Present Worth Cost	A method of evaluation of expenditures that occur over different time periods. By discounting all costs to a common base year, the costs for different remedial action alternatives can be compared on the basis of a single figure for each alternative. When calculating present worth cost, total operations and maintenance costs are included.

Project Information Repository	A file containing current information, technical reports, and reference documents duplicated from the Administrative Record maintained for a site. The project information repository is usually located in a public building convenient for local residents, such as a public school, city hall, or library. The project information repository is located at the Highland Falls Library, 298 Main Street, Highland Falls, NY 10928. In addition, files have also been placed at the following libraries for review during the public comment period: the Julia L. Butterfield Memorial Library, 10 Morris Avenue, Cold Spring, NY 10516; and the Desmond-Fish Public Library, 472 Route 403, Garrison, NY 10524.
Projectile	An object projected by an applied force (e.g., fired or shot) and continuing in motion by its own inertia, such as a bullet, bomb, shell, or grenade.
Proposed Plan	A document that presents a proposed remedial (cleanup) alternative, including the rationale for selection, and requests the public to provide comments regarding the preferred alternative.
Regulatory	Restricting according to rules or principles.
Remedial Action	An action taken to remove munitions or chemicals from the environment that may pose a risk to humans, animals, or other potential receptors, or to prevent these munitions or chemicals from entering the environment and causing risk. The term includes, but is not limited to, actions such as covering or capping, excavation and disposal, chemical treatment, incineration, transportation, storage, or any other actions necessary to protect the public health or welfare and the environment, such as land use and institutional controls.
Remedial Action Objectives	Objectives established for remedial actions to guide the development of remedial alternatives and focus the comparison of acceptable remedial alternatives, if warranted. Remedial action objectives also assist in clarifying the goal of minimizing risk and achieving an acceptable level of protection for human health and the environment.
Remedial Investigation	A study of a site that provides information regarding the location and concentration of chemicals and munitions in soil, surface water, groundwater, and/or sediment, and whether these chemicals and munitions pose a risk to human health and the environment.
Remotely Operated Vehicle	An unoccupied vehicle that can be used to explore underwater areas and is controlled by an operator at the water surface.
Responsiveness Summary	This summary includes an Army response to all public comments received during the public comment period held for the Proposed Plan.
Risk Management Methodology	The process of analyzing, selecting, implementing, and evaluating actions to reduce risk. The guidance for the process used at the Water MRSs was developed for the Formerly Used Defense program in 2017 and has been utilized by the Army to evaluated risks at MMRP sites.
Site Inspection	A study of a site that determines if munitions constituents or MEC are present at an MRS and if a remedial investigation should be conducted.
Source	One of three elements required for an explosives safety hazard to exist. A source is an MEC item or munitions debris that suggests that an MEC item may also be present.
Statutory	Required, permitted, or enacted by law.
Unexploded Ordnance	Includes military munitions that have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material; and remain unexploded either by malfunction, design, or any other cause. 10 USC 101(e)(5)(A) through (C) and 40 Code of Federal Regulations (CFR) 266.201.
Visual Survey	An activity conducted by specially trained workers who look for MEC and munitions debris located on the ground. This activity is often assisted by a handheld metal detector.

ACRONYMS AND ABBREVIATIONS

3Rs	Recognize, Retreat, and Report
ARARs	Applicable or Relevant and Appropriate Requirements
Army	U.S. Department of the Army
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DGM	digital geophysical mapping
ft	foot/feet
FUDS	Formerly Used Defense Site
lb	pound(s)
LUC	land use control
MC	munitions constituents
MD	munitions debris
MEC	munitions and explosives of concern
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	operations and maintenance
RAO	remedial action objective
RI	remedial investigation
SI	site inspection
TBC	to be considered
TD	Transferred
USC	United States Code
UXO	unexploded ordnance
West Point	U.S. Army Garrison West Point

USE THIS FORM TO WRITE YOUR COMMENTS

Your input on this Proposed Plan is important to the Army. The comments that the Army receives will be used to select the remedial alternative for the two MRSs: Siege Battery–TD River and Battery Knox–TD River. Changes to the preferred alternatives can be made based on comments made by the public.

Please use the space below to submit your comments on this Proposed Plan to the Army. If you need more space for your comments, attach additional pages.

After you have completed the form, e-mail to:

Mr. Paul Dunaev, U.S. Army Garrison West Point
paul.v.dunaev.civ@army.mil

Or by mail to:

Mr. Paul Dunaev
U.S. Army Garrison West Point
ATTN: AMM-MLP-E
667A Ruger Road
West Point, NY 10996-1592

If you have any questions about the public comment process, please contact Paul Dunaev at (845) 938-5041.

Comments must be postmarked or e-mailed by January 10, 2024.

Name_____

Affiliation_____

Address_____

City, State, Zip_____

Follow the 3Rs

Recognize

Recognize when you may have encountered a munition.

Recognizing when you may have encountered a munition is the most important step in reducing the risk of injury or death. Munitions may be encountered on land or in the water. They may be easy or hard to identify.

To avoid risk of injury or death:

- Never move, touch, or disturb a munition or suspect munition.
- Be aware that munitions do not become safer with age, in fact, they may become more dangerous.
- Do not be tempted to take or keep a munition as a souvenir.

Munitions come in many sizes, shapes, and colors. Some may look like bullets or bombs, while others look like pipes, small cans, or even a car muffler. Whether whole or in parts, new or old, shiny or rusty, munitions can still explode.

Retreat

Do not touch, move, or disturb it; but carefully leave the area.

Avoid death or injury by recognizing that you may have encountered a munition and promptly retreating from the area.

If you encounter what you believe is a munition, do not touch, move, or disturb it. Instead, immediately and carefully leave the area by retracing your steps, leaving the same way you entered. Once safely away from the munition, mark the path (e.g., with a piece of clothing or global positioning system (GPS) coordinates) so response personnel can find the munition.

CALL!

On-post Military Police 845-938-3333
845-938-3312

Off-post 911

Report

Immediately notify the police.

Protect yourself, your family, your friends, and your community by immediately reporting munitions or suspected munitions to the police.

Help the police by providing as much information as possible about what you saw and where you saw it. This information will help the police and the military or civilian explosives ordnance disposal personnel find, evaluate, and address the situation.

If you believe you may have encountered a munition, call and report the following information:

- The area where you encountered it.
- Its general description. Remember: do not approach, touch, move, or disturb it.
- When possible, provide:
  - Its estimated size
  - Its shape
  - Any visible markings, including coloring

3-inch Stokes Mortars and related debris