

87th Air Base Wing



Joint Base McGuire-Dix-Lakehurst Public Meeting – February 17, 2022

Proposed Plan

**Lakehurst Former Submarine Bombing Target Munitions
Response Site (ZZ001)**

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87th Air Base Wing



Mr. James C. Richman
Remediation Program Manager, Joint Base McGuire-Dix-Lakehurst

Ms. Lauren Heilmann, Project Manager, Trevet

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Public Meeting Purpose



-
- **The Air Force is inviting the public to comment on the preferred remedy for the Lakehurst Former Submarine Bombing Target Munitions Response Site (ZZ001).**
 - **The opening of a 30-day public comment period was posted in the Asbury Park Press, Burlington County Times, and Pine Barrens Tribune and started February 12, 2022 and will end March 14, 2022.**
 - **Comments from the public may be submitted this evening or sent to Mr. James Richman (mail or e-mail provided later in presentation and in the proposed plan and fact sheet).**

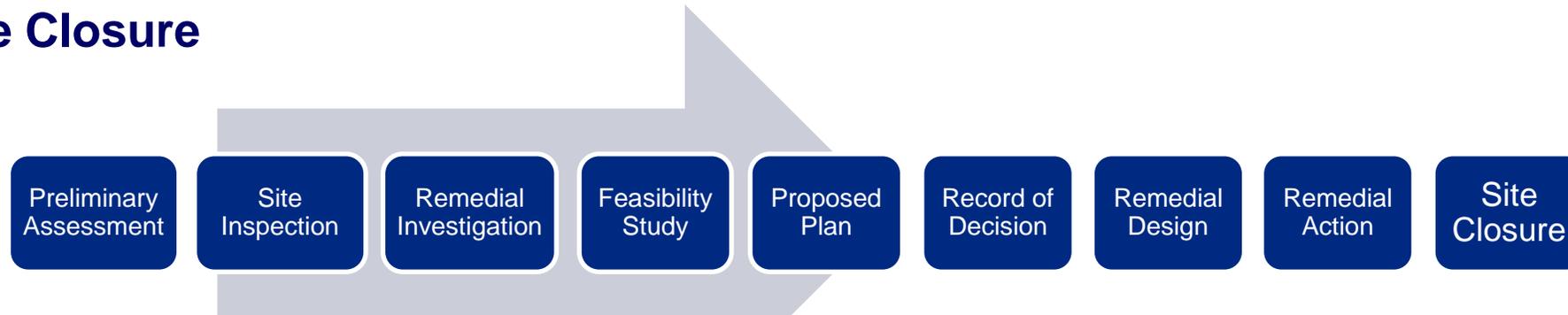
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Status of Cleanup Process



- Remedial Investigation – site characterization and risk assessment
- Feasibility Study – remedy evaluation
- Proposed Plan – solicit public input on preferred remedy
- Record of Decision – legal documentation of remedy selection
- Remedial Design / Remedial Action – remedy planning and implementation
- Site Closure



***The Cleanup Process is carried out in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act**

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Proposed Plan



-
- Provides information necessary to allow the public to participate in selecting the appropriate remedial alternative for Lakehurst Munitions Response Site ZZ001

 - The Proposed Plan:
 - Summarizes site history, previous investigations, and results of human health and ecological risk assessments
 - Describes remedial alternatives considered
 - Provides a comparative analysis of remedial alternatives based upon U.S. Environmental Protection Agency established criteria
 - Presents the preferred remedial alternative
 - Contains information on community participation

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Presentation Agenda



-
- **Site History & Background**
 - **Previous Investigations**
 - **Risk Assessment Results**
 - **Remedial Action Objectives**
 - **Development & Evaluation of Remedial Alternatives**
 - **Preferred Remedial Alternative**
 - **Public Comment Period Information**

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**Ms. Lauren Heilmann
Project Manager, Trevet**

**PROPOSED PLAN FOR
LAKEHURST FORMER SUBMARINE BOMBING TARGET
MUNITIONS RESPONSE SITE (ZZ001)**

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Site History & Background

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Site History & Background



- **Munitions Response Site ZZ001 is approximately 13 acres in size and is located in the southeastern portion of the Lakehurst Area of Joint Base McGuire-Dix-Lakehurst.**
- **A target in the shape of a German U-boat was used by military aircraft at the site to drop practice or explosive bombs.**
- **The target was used from approximately 1933 to 1945.**
- **Official Navy documents from 1943 indicate that flights were conducted at 500 feet or less and that bomb drops were performed from about 50 feet above ground level almost daily in the early days of World War II.**
- **Pilots also released miniature bombs from airships for training purposes.**

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Site History & Background

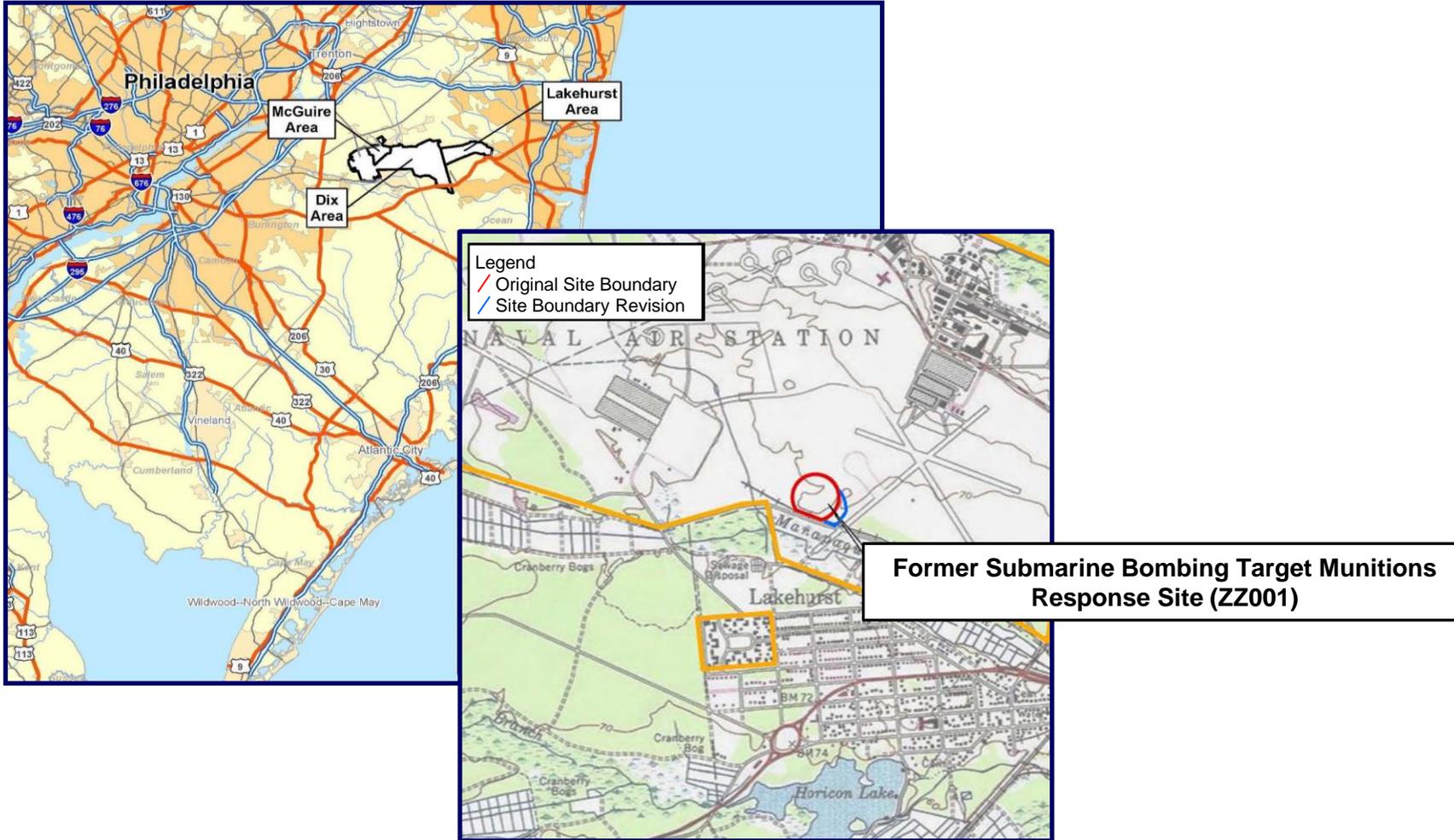


-
- Munitions and explosives of concern and munitions debris recovered include MK15 Mod 2, 100-lb practice bombs; MK23, 3-lb practice bombs; and MK5, practice bombs.
 - Munitions debris recovered also included an aluminum launching tube from a M127 series illumination flare and a hand grenade safety lever (potentially from a MK II grenade).
 - The site may have also received smoke flares, signal flares, illuminating flares, miniature training bombs, and other practice bombs.
 - Drops were also conducted to test the experimental X7 40M depth bomb.

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Site Location



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Site Layout and 1953 Historical Aerial Photo



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Site Characteristics



- According to the Lakehurst Installation Development Plan, the long-term planned use for Munitions Response Site ZZ001 is undeveloped land.
- The site is currently not in use and there are no buildings onsite. Roadways exist adjacent to the site.
- Land use is not expected or proposed to change in the future. Much of the site has reverted to a natural, forested condition.
- The existing degree of site disturbance is minimal and is limited to possible subgrade utility placement and repair and periodic vegetation management operations along existing adjacent roadways.
- There are no wetlands within the site boundary; the nearest wetlands are approximately 700 feet to the west and 300 feet to the south.

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Current Site Conditions



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Previous Investigations

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Previous Investigations



- **Investigations were completed between 2006 – 2018 including:**
 - **2006 Preliminary Assessment**
 - **2011 Light Detection and Ranging Survey**
 - **2012 Site Inspection**
 - **2018 Remedial Investigation**
- **Munitions and explosives of concern and munitions debris were identified.**
- **During the Remedial Investigation, 75 munitions and explosives of concern and 33 munitions debris items were discovered in soil down to a depth of 48 inches.**
- **The highest concentration of items were situated in the southern portion of the site.**
 - **The site boundary was extended about 2 acres to the east**

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Previous Investigations



**Recovered Munitions and Explosives of Concern
(MK23 3-lb Practice Bombs and MK5 Practice Bombs
with MK4 Signal Cartridges)**

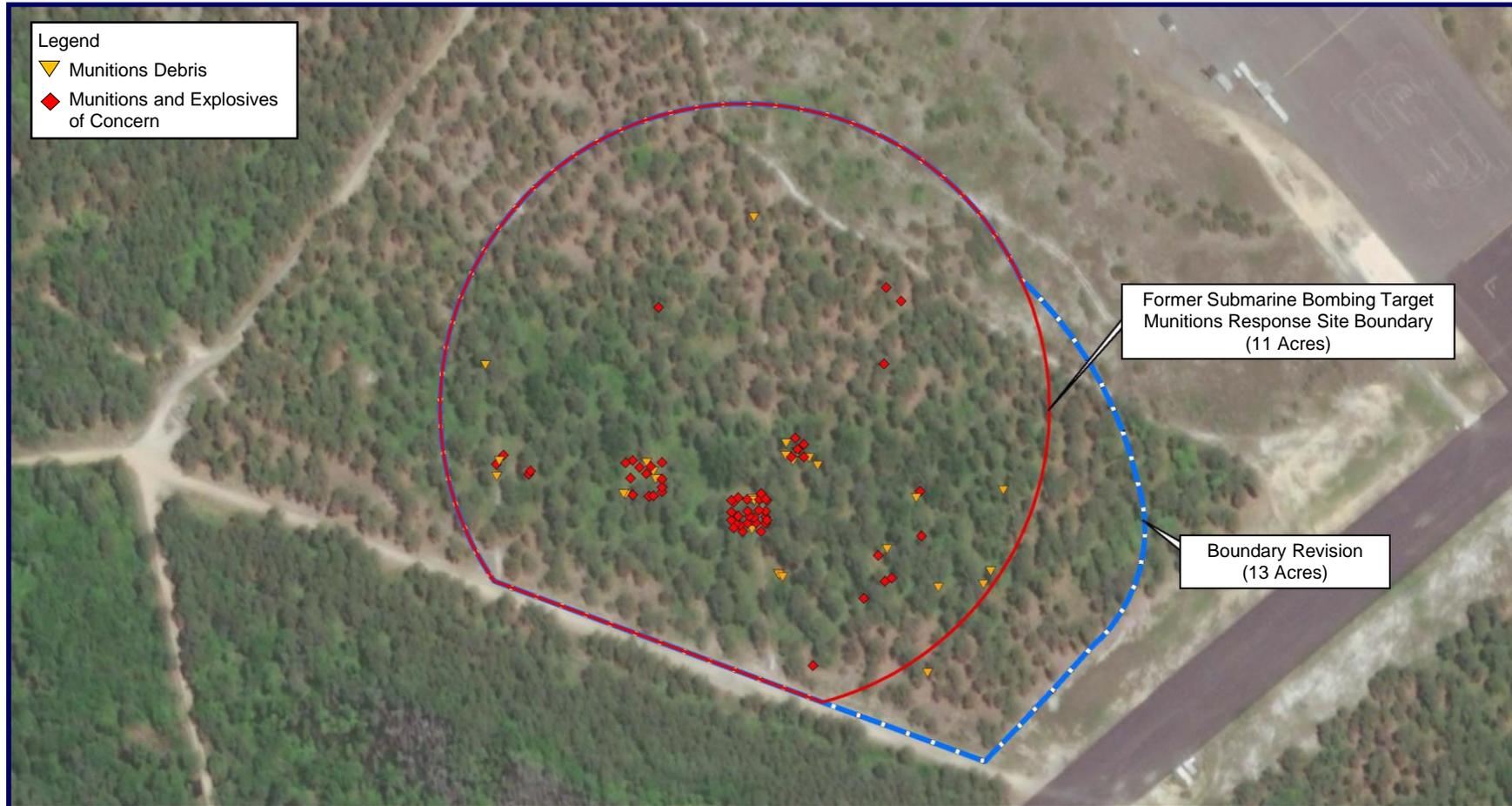


Recovered Munitions Debris





Previous Investigations



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Previous Investigations



-
- During the Remedial Investigation, aluminum, chromium, and lead were detected in soil above screening levels; however, all concentrations were below background values, and it was determined that the metals are naturally occurring.
 - Aluminum, arsenic, and iron were also detected in groundwater, but at concentrations well below background values.
 - No other explosives or munitions constituents were detected in soil or groundwater.



Risk Assessment Results

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Risk Assessment



-
- A risk assessment is a U.S. Environmental Protection Agency approved quantitative method to assess possible human health and ecological risks based on:
 - A hazard assessment—chemicals above minimum health screening levels are carried into the risk assessment
 - An exposure assessment—will populations be exposed to these chemicals and how (residential use, industrial use, recreation etc.)
 - A toxicity assessment—what is the possible health effect based on the chemical concentration and toxicity



Human Health Risk Assessment Results



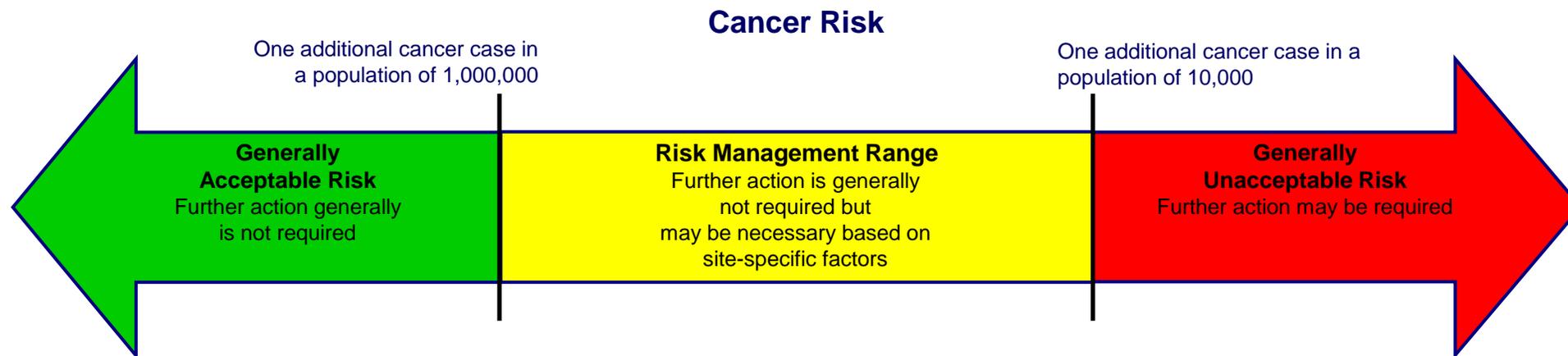
- The Human Health Risk Assessment was conducted as part of the Remedial Investigation.
- Chromium VI was selected as the only human health chemical of potential concern in soil.
- Aluminum, arsenic, and iron were selected as chemicals of potential concern in groundwater.
- Human receptors evaluated included current and future site residents, recreators, and industrial workers.
- Assessments were performed to evaluate potential risk from:
 - Chromium VI in soil
 - Aluminum, arsenic, and iron in groundwater



Human Health Risk Assessment Results



- Cancer risks based on chromium VI in soil for all human receptors were calculated to be below or within the U.S. Environmental Protection Agency's risk management range.
- Cancer risk based on arsenic in groundwater was also calculated to be within the risk management range.
- Cancer risks based on aluminum and iron in groundwater were not calculated since they are not carcinogens.



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Human Health Risk Assessment Results



-
- **Noncancer hazards based on chromium VI in soil for all human receptors were below the U.S. Environmental Protection Agency's hazard threshold.**

 - **Cumulative noncancer hazards based on aluminum, arsenic, and iron in groundwater were also below the hazard threshold.**



Human Health Risk Assessment Conclusions



- **Metals concentrations are not indicative of a munitions constituents release at Munitions Response Site ZZ001.**
 - All detections were well below background values and suggest metals are naturally occurring.
 - Chromium VI is not associated with munitions historically used at the site.
 - No other munitions-related constituents were detected.
- **Risk estimates are considered representative of background risk, and the metals are not likely to pose a risk to residents, industrial workers, or recreational visitors.**
- **In summary, the site does not pose unacceptable risks or hazards to human health.**

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Ecological Risk Assessment Results



-
- **A Screening Level Ecological Risk Assessment was conducted as part of the Remedial Investigation.**
 - **Aluminum, chromium, iron, and lead were selected as initial chemicals of potential ecological concern in soil.**
 - **Groundwater was not evaluated.**
 - **Ecological receptors are not anticipated to come into direct contact with groundwater.**
 - **No surface water bodies exist within or in the vicinity of the site.**



Ecological Risk Assessment Results



- **Aluminum and iron were excluded from further evaluation.**
 - They are not hazardous substances that require remedial action.
 - Detected concentrations were below background values.
- **Chromium and lead were evaluated for potential risk to terrestrial plants, invertebrates, mammals, and birds.**
- **Based on refined risk estimates, chromium and lead are unlikely to pose unacceptable risk.**
 - Hazards for all terrestrial receptors were below the U.S. Environmental Protection Agency's benchmark.



Ecological Risk Assessment Conclusions



-
- **The Screening Level Ecological Risk Assessment concluded that Munitions Response Site ZZ001 does not pose unacceptable risks to ecological receptors**
 - **Small areal extent of contamination**
 - **No endangered, threatened, or special concern species**
 - **Low potential for adverse ecological effects**
 - **All metals detections were below background values and are indicative of naturally occurring concentrations.**



Munitions and Explosives of Concern Hazard Assessment



- Rates relative explosives risk to human health.
- The Munitions of Explosives Concern Hazard Assessment Tool assigns one of four defined “Hazard Levels”
 - Hazard Levels are based on considerations such as site conditions, types of known or suspected munitions and explosives of concern, and how human receptors could be affected.
 - Hazard Level 1 indicates the highest hazard potential
 - Hazard Level 4 indicates the lowest
- Munitions Response Site ZZ001 was assigned a Hazard Level Category of 3 (moderate hazard potential).



Munitions Response Site Prioritization Protocol



- **Assigns relative priorities to sites for munitions responses based on a scale from 1 to 8**
 - Priority of 1 is the highest potential hazard and priority for a munitions response
 - Priority of 8 is the lowest
- **The Priority is considered in determining the future funding sequence for future munitions response action.**
- **Munitions Response Site ZZ001 was assigned a Priority of 5.**



Remedial Action Objectives

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Feasibility Study



-
- **Trigger for remedial action at Munitions Response Site ZZ001:**
 - Munitions and explosives of concern were previously removed, but may remain
 - Potential explosives risk
 - **A Feasibility Study was conducted to:**
 - Identify applicable or relevant and appropriate requirements (federal and state laws and regulations that may apply)
 - Develop remedial action objectives
 - ◆ *What are the goals for protecting human health and the environment?*
 - Evaluate possible remedial alternatives



Remedial Action Objectives



- Consider nature and extent of contamination and human and ecological receptors
- Comply with applicable or relevant and appropriate requirements
 - Federal and state laws and regulations that may apply to a site

Example of Identified Requirement	Description of Requirement
Migratory Bird Treaty Act	Any vegetation removal activities cannot take place between April 15 and August 31
Clean Water Act	Requires soil erosion and sediment control measures for activities disturbing > 5,000 ft ²

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Remedial Action Objectives



-
- **No. 1 (Human Health) – Reduce unacceptable hazard to site users/workers via direct contact with munitions and explosives of concern in surface soil (exposed, at least partially, on the ground surface) to support current and future land use**

 - **No. 2 (Human Health) – Reduce unacceptable hazard to site workers via direct contact with munitions and explosives of concern in subsurface soil (through intrusive activities) down to a depth of 48 inches to support current and future land use**

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Development & Evaluation of Remedial Alternatives

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Development & Evaluation of Remedial Alternatives



-
- **Four remedial alternatives were developed:**
 - 1. No Action**
 - 2. Land Use Controls**
 - 3. Land Use Controls with Munitions and Explosives of Concern Surface Clearance**
 - 4. Munitions and Explosives of Concern Surface and Subsurface Clearance with Land Use Controls**

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Alternative 1 – No Action



-
- The “No Action” alternative is evaluated as a baseline to compare other remedial action alternatives.
 - Includes no remedial actions of any kind.
 - Does not protect human health by meeting remedial action objectives.
 - Does not comply with applicable or relevant and appropriate requirements.



Alternative 2 – Land Use Controls



- **Manages potential explosives hazards through land use controls consisting of:**
 - **Engineering Controls**
 - ◆ Warning signs and annual site inspections
 - **Administrative Controls**
 - ◆ Base dig permit process
 - ◆ Construction support
 - ◆ Installation Development Plan updates
 - **Educational Controls**
 - ◆ Informational pamphlets, fact sheets, and education sessions
- **Includes annual land use control inspections**
- **Includes five year reviews**



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Alternative 3 – Land Use Controls with Munitions and Explosives of Concern Surface Clearance



- Includes land use controls as well as:
 - Limited vegetation removal
 - Munitions and explosives of concern surface clearance
 - ◆ Visual and instrument-guided detection and geospatial positioning
 - ◆ Recurring surface removal by hand excavation (every 5 years)
 - ◆ Proper destruction and subsequent off-base disposal of any resulting remnants or munitions debris determined to be safe
 - Annual land use control Inspections
 - Five year reviews



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Alternative 4 – Munitions and Explosives of Concern Surface and Subsurface Clearance with Land Use Controls

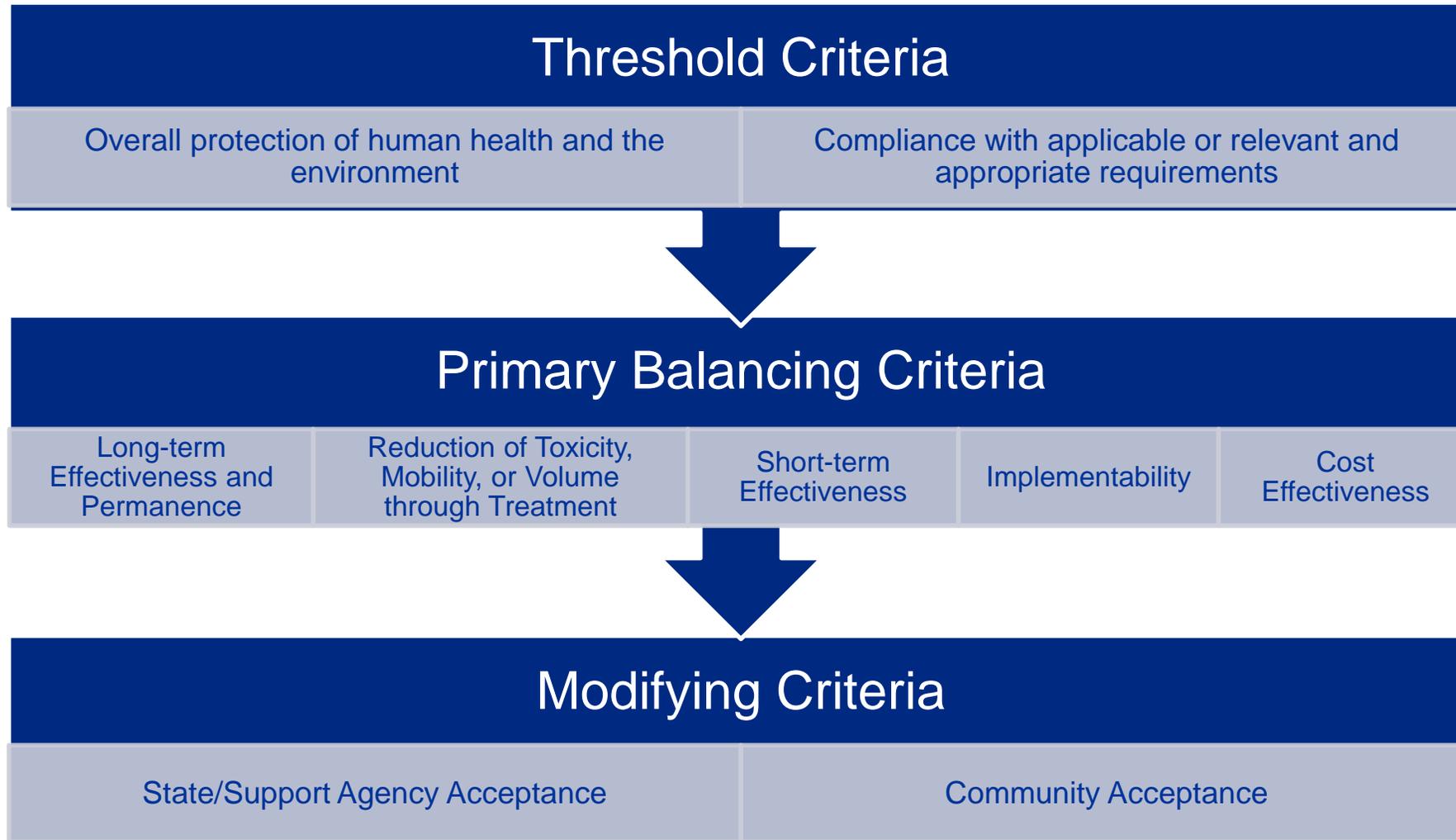


- Includes land use controls and munitions and explosives of concern surface clearance (every 5 years) as well as:
 - Munitions and explosives of concern subsurface clearance:
 - ◆ Vegetation removal, including small trees and brush
 - ◆ Subsurface removal by hand excavation or by mechanical excavation for deeper items to within 12 inches, followed by hand excavation
 - ◆ Ground surface and vegetation restoration
 - Annual land use control inspections
 - Five year reviews

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Evaluation Criteria



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Evaluation of Remedial Alternatives



○ = Poor ◐ = Adequate ◑ = Good ● = Excellent

Alternative / Evaluation Criterion	(1) No Action	(2) Land Use Controls	(3) MEC Surface Clearance with LUCs	(4) MEC Surface and Subsurface Clearance with LUCs
1. Overall Protection of Human Health and the Environment	Does not meet	Meets	Meets	Meets
2. Compliance with ARARs	Does not meet	Meets	Meets	Meets
3. Long-term Effectiveness and Permanence	○	◐	●	●
4. Reduction in Toxicity, Mobility, or Volume through Treatment	○	○	●	●
5. Short-Term effectiveness	○	●	◑	◑
6. Implementability	●	●	◑	◐
7. Cost ^a	● (\$0)	◑ (\$237,221)	◐ (\$816,230)	○ (\$1,626,339)

ARAR – applicable or relevant and appropriate requirement
 LUC – land use control
 MEC – munitions and explosives of concern

^a Costs are the total present worth derived from the Feasibility Study evaluation (2019).

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Preferred Alternative: Alternative 3



-
- **Alternative 3 provides a medium to high level of protection to human health and a medium level of reduction of explosive hazards by eliminating or reducing the amount of surface munitions and explosives of concern.**
 - **Subsurface munitions and explosives of concern would not be eliminated but would be managed by implementing land use controls.**
 - **Higher cost than Alternative 2, but it would provide a more permanent reduction of risk to human health and the environment.**

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Preferred Alternative: Alternative 3



-
- **Reliability significantly reduces uncertainty for cost and long-term effectiveness and permanence as compared to Alternative 2, which does not include munitions and explosives of concern removal.**
 - **Readily implementable and includes limited vegetation removal and more feasible technology than Alternative 4.**

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Munitions Response Site ZZ001 Proposed Plan



- **The Proposed Plan is available for public review from February 12, 2022 to March 14, 2022 at the following locations:**

U.S. Environmental Protection
Agency
Region II Records Center
18th Floor, 290 Broadway
New York, NY 10007

New Jersey Department of the
Environment
Records Custodian
401 East State Street
Trenton, NJ 08625

Ocean County Library
101 Washington Street
Toms River, NJ 08753

- **A copy is also available online at: <https://ar.afcec-cloud.af.mil/> or at www.envirostorejbmdl.com (click on the Community Involvement tab).**
- **Public comments will be reviewed and considered before remedy selection is finalized and documented in the Record of Decision.**

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Public Comments



- **Comments from the public will be accepted tonight**
- **All other comments will be accepted through March 14, 2022**
- **Send written comments to the following:**
 - **Mail:**

Mr. James Richman
Remediation Program Manager
787 CES/CEIE
2403 Vandenberg Avenue
Joint Base McGuire-Dix-Lakehurst, NJ 08641
 - **E-mail: james.richman.1@us.af.mil**

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Munitions Response Site ZZ001 Proposed Plan



QUESTIONS?

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