

Formerly Used Defense Site (FUDS) Program

U.S. EPA and GSA Area – Hazardous and Toxic Waste/Munitions and Explosives of Concern in Soil and Sediment

Former Raritan Arsenal Edison, New Jersey

U.S. Army Corps of Engineers, New York District

U.S. Army Corps of Engineers, New England District

12 January 2022



Virtual Meeting Etiquette

- Please mute the volume on your computers or phones.
- Please hold all questions and comments until the end of the presentation.
- This meeting will be recorded and transcribed.
- Additional questions and comments can be emailed or submitted, no later than **14 February 2022**:

By mail:

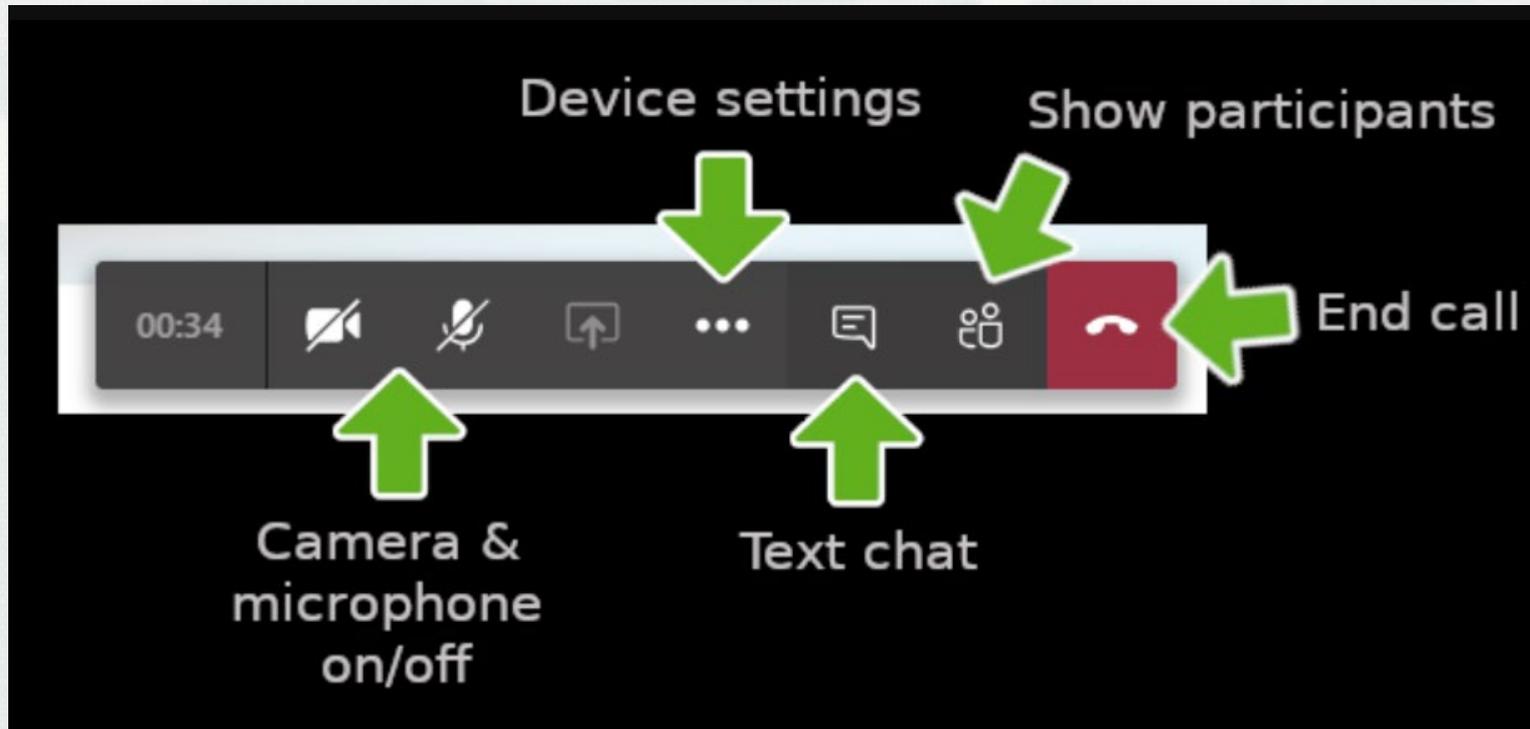
Mr. James Kelly
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By email:

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Teams Orientation



Project Personnel and Stakeholders

- USACE Project Delivery Team Project Manager and Technical Lead: James Kelly, New England District
- Regulatory Agency: New Jersey Department of Environmental Protection, Ralph Rodrigues and Scott Vondy
- Stakeholders: U.S. EPA, Edison Township, Federal Business Center
- USACE Contractor: Bluestone Environmental Group, Christen Sardano, LSP, and Mike Badeau, PE, Project Managers



Presentation Overview

- Formerly Used Defense Site (FUDS) Process
- Project Description/History
- Summary of Investigations to Date
- Remedial Investigation (RI)
 - ▶ Nature and Extent of Contamination
 - ▶ Fate and Transport of Contaminants
 - ▶ Risk Assessment
 - ▶ Recommendation of No Further Action
- Proposed Plan and Public Comment Process
- Decision Document
- Questions and Comments



Summary of USACE Process for FUDS

Determination of Eligibility
Is the site eligible?

Preliminary Assessment
Historical records research

Site Inspection
Is contamination present?

Remedial Investigation
What are the contaminants?
Where are they located?

Removal Actions

Feasibility Study
Develop and evaluate
cleanup options

Proposed Plan and Public Comment Period
Present preferred cleanup strategy
for public review and comment

Decision Document
Document selected cleanup
alternative after consideration of
public comments

Remedial Action
Implement the cleanup



Project Description

- U.S. Environmental Protection Agency (EPA) and General Services Administration (GSA) Area.
- Approximately 178 acres.
- Evaluation of two potential site contaminants:
 - ▶ Hazardous and Toxic Waste (HTW) in Soil and Sediment
 - ▶ Presence and potential of Munitions and Explosives of Concern (MEC).
- No Further Action.
- Groundwater and potential vapor intrusion (VI) concerns were evaluated site-wide in a separate Feasibility Study.



Former Raritan Arsenal Description

- Over 3,300 acres.
- Along northern bank of the Raritan River.
- Used by the U.S. Army from 1917 to 1963.
- U.S. Army received, stored, shipped and/or decommissioned ordnance, arms, and machinery.
- Current uses:
 - ▶ Northern portion developed
 - ▶ Southern portion primarily tidal marsh.
- Numerous soils and munitions removal activities since the 1990s.
- Cleanup managed through the FUDS program and Comprehensive Environmental Response Compensation and Liability Act (CERCLA) process.

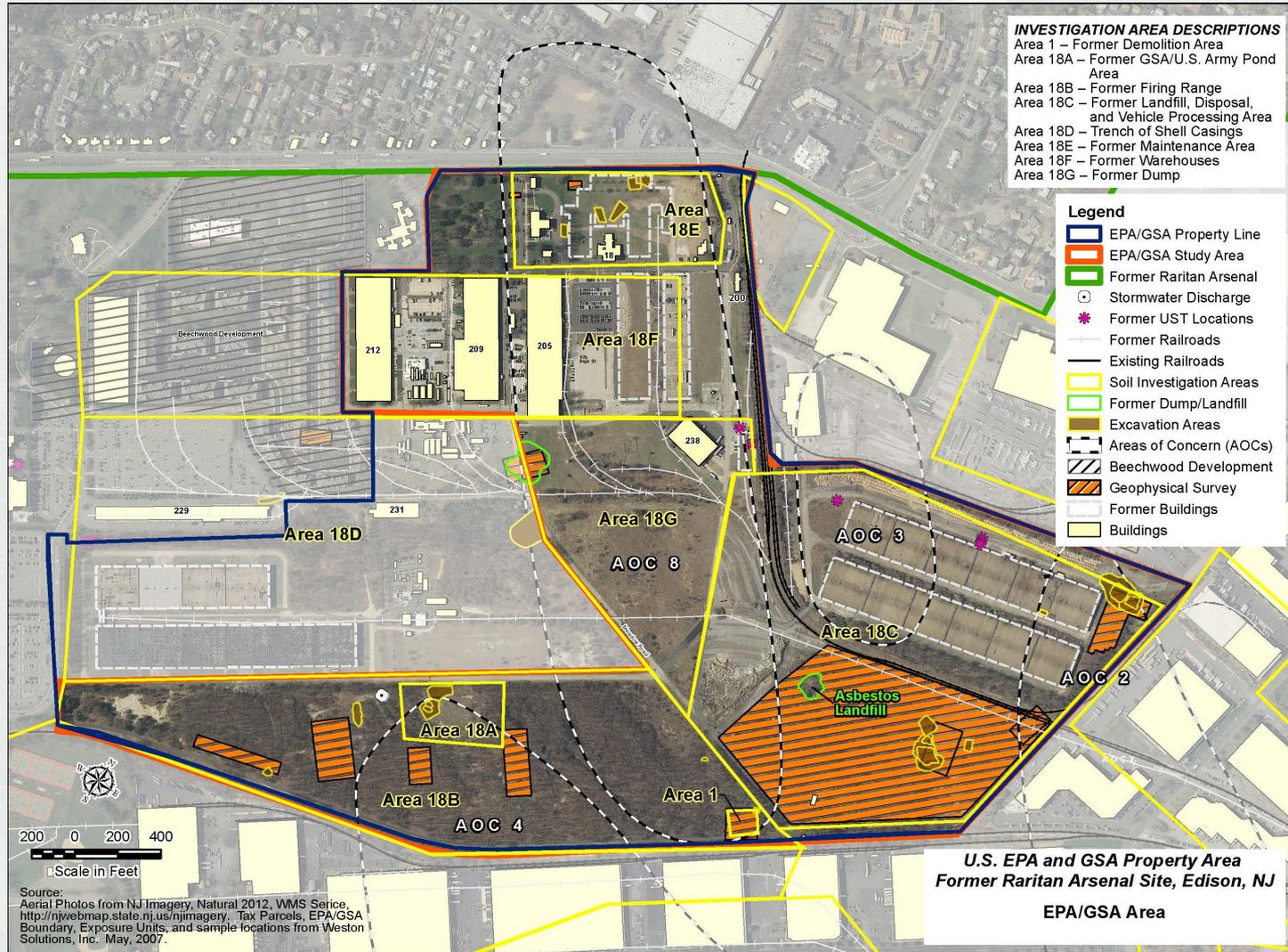


Historical Use

- Initial Missions (1917-1918): Storage and handling of ordnance material and general supplies, assembling plant for constructing automobiles, trucks, tanks, and motorized artillery pieces, and ordnance training camp.
- Post World War I (WWI, 1919-1922): Receipt, storage, and preservation of ordnance material.
- Peace Time Operations (1922-1938): Continued receipt, storage, and preservation of ordnance material.
- Defense Period (1938-1942): Receipt, storage, renovation, segregation, salvage, disposal, research and development, manufacture, and shipment of ammunition.
- World War II (WWII, 1942-1948): Receipt, storage, and shipment overseas of ammunition, components, and ordnance supplies.
- Korean Conflict/Cold War Era (1949-1961): Continued supply, ammunition, maintenance, storage, ordnance renovation, and salvage activities.
- Arsenal Phase-Out (1961-1963): Shipment of ordnance material and general supplies to other arsenals and military facilities, removing usable equipment and decontamination activities.



EPA/GSA Area Layout



Previous Investigations

- Archival searches
- Geophysical surveys
- Soil investigations
- Groundwater investigations (evaluated in a separate study)
- Response actions performed to remove identified contamination at Areas 18A, 18B, 18C (Building 256, Drum Disposal Areas 1-4), 18E, and 18F
- Capping/covering of the Asbestos Landfill in Area 18C (non-FUDS)
- Underground storage tank (UST) removals
- Ongoing monitoring of 3 groundwater plumes
- Baseline Human Health Risk Assessment (HHRA)
- Screening Level and Baseline Ecological Risk Assessment (SLERA/BERA)



Investigation Areas

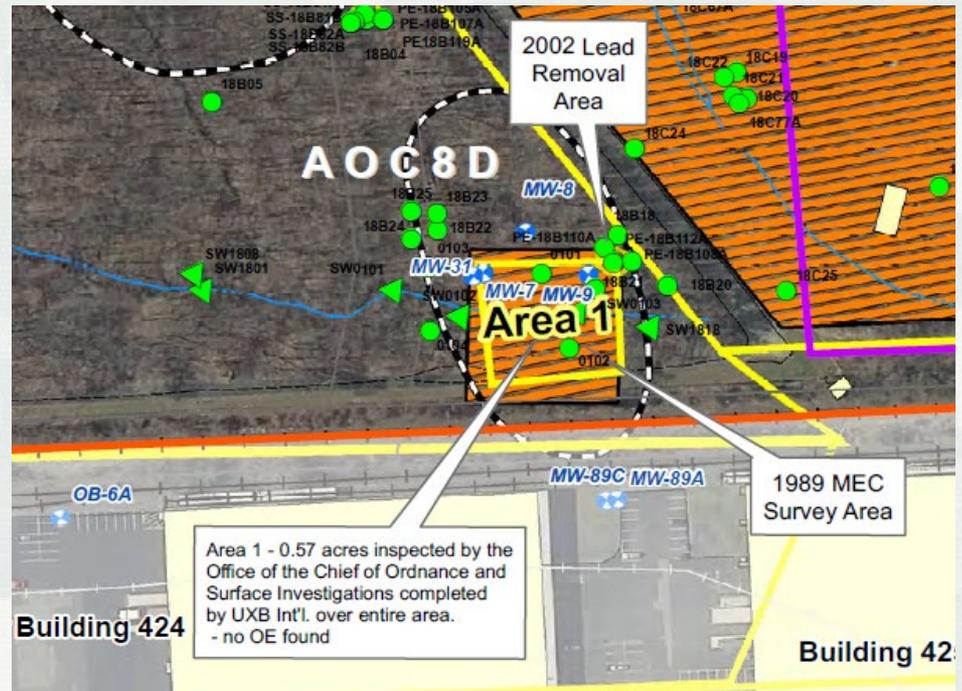
- **Area 1** – Former Demolition Area
- **Area 18A** – Former GSA/U.S. Army Pond Area
- **Area 18B** – Former Firing Range
- **Area 18C** – Former Landfill, Disposal, and Vehicle Processing Area
- **Area 18E** – Former Maintenance Area
- **Area 18F** – Former Warehouses
- **Area 18G** – Former Dump



Investigation Areas Summary

Area 1: Former Demolition Area

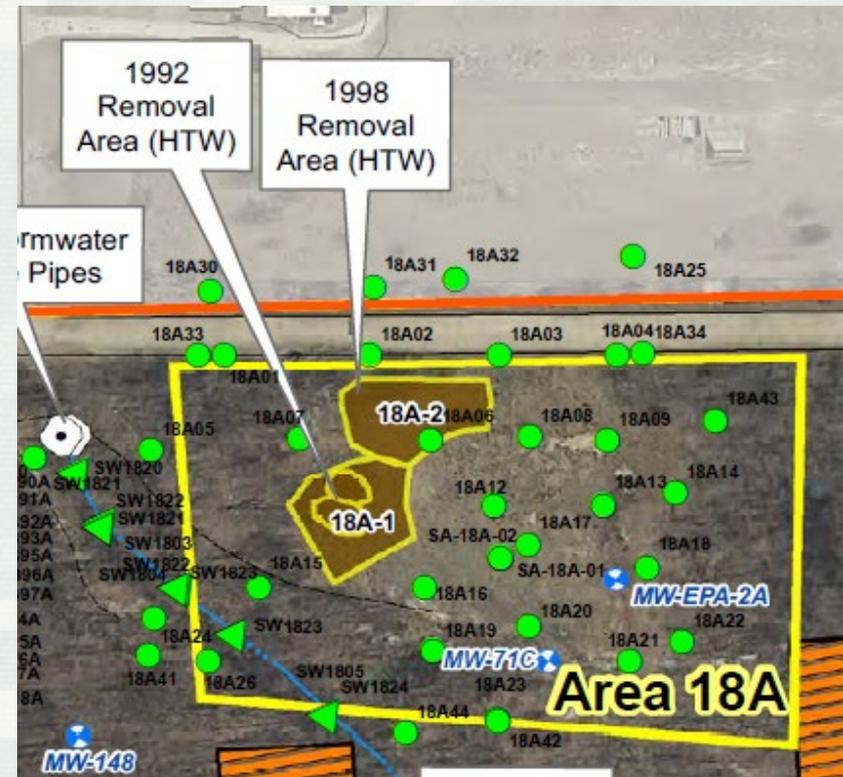
- Approximately 0.57 acres
- Reportedly used after World War I to early 1930s for destruction of:
 - ▶ Adapter boosters
 - ▶ Fuzes
 - ▶ Projectiles



Investigation Areas Summary

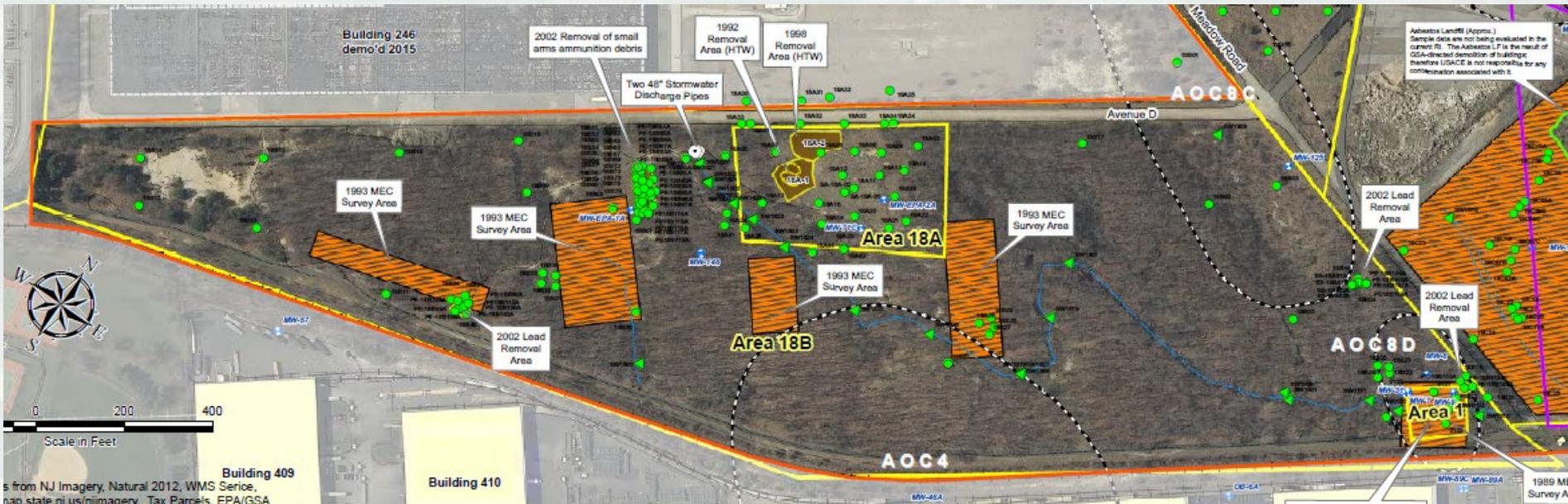
Area 18A: Former GSA/U.S. Army Pond Area

- Approximately 3 acres
- Formerly a man-made pond
- First appeared in a 1951 aerial photograph
- Identified as a "tar pit" during 1991 archival research
- 1951 tar pit coincided with the appearance of two oil tanks.



Investigation Areas Summary

Area 18B: Former Firing Range



- Approximately 50 acres
- Surrounds Area 18A
- Includes former location of a firing range (only small arms firing occurred)
- Delineated by ground scars in historical aerial photographs.
- Contains "Area 18B Stream" - intermittent stormwater drainage fed by two 48-inch diameter storm drains from rooftops and paved areas. Constructed by DoD when the Raritan Arsenal was active.



Investigation Areas Summary

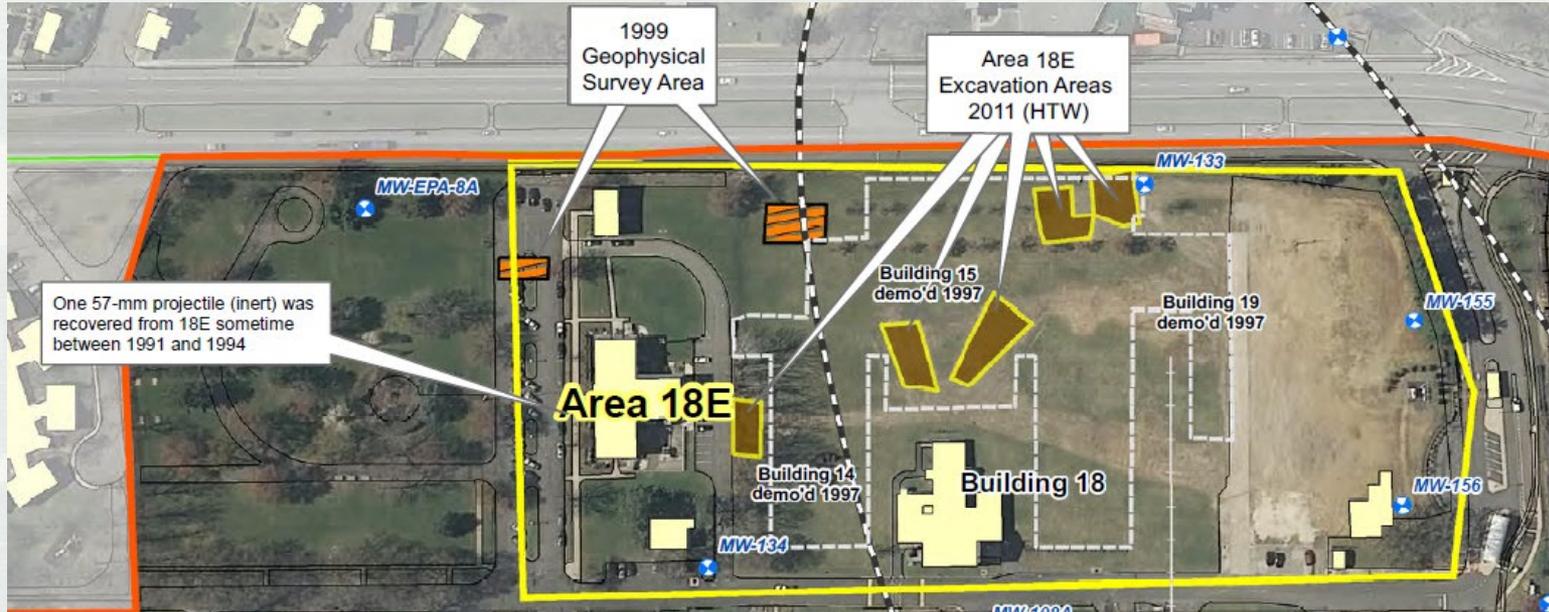
Area 18C: Former Landfill, Disposal, & Vehicle Processing

- 58 acres
 - ▶ Foundations of former DoD Buildings 255 and 256, historically used for vehicle storage, assembly, repair, and painting. Demolished in August 2014.
 - ▶ Asphalt and railroad areas
 - ▶ Undeveloped land
- Late 1970s/early 1980s - portion of landfill area used as dumping ground for GSA-directed demolition building debris, some asbestos. The "Asbestos Landfill" is approximately 0.25 acre within the larger landfill area. **"Asbestos Landfill" contamination (asbestos and non-asbestos) is not related to historical DoD activities.** It is USACE understanding that this area will be addressed by GSA.
- Large, paved lot adjacent to former Buildings 255 and 256, "washed out" with considerable depressions and changes in elevation (may be the result of differential settling of potentially contaminated fill material below the asphalt).



Investigation Areas Summary

Area 18E: Former Maintenance Area



- 3 former Army buildings demolished by EPA in 1997:
 - ▶ Building 14 served as a small arms shop
 - ▶ Building 15 served as a machine shop
 - ▶ Building 19 was referred to as a vehicle rebuild assembly shop
 - ▶ The buildings were joined together as of 1940 (historical aerial photography)



Investigation Areas Summary

Area 18F: Former Warehouses

- Approximately 43 acres
- Small arms packing operation and several warehouses
- Original Buildings 205, 209, and 212 used by EPA
- Buildings 202 and 203 demolished in 1994 by EPA



Investigation Areas Summary

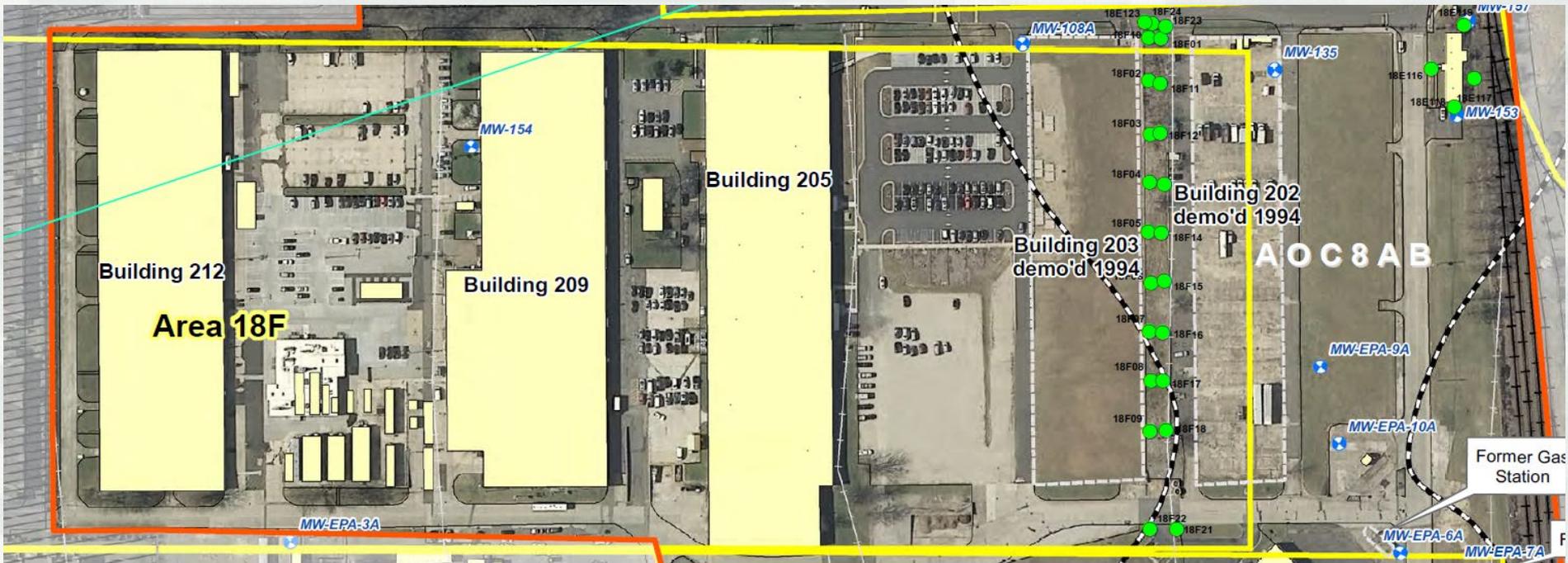
Area 18F: Former Warehouses (continued)

- Building 202:
 - ▶ 1918 and 1919 parts and truck storage.
 - ▶ 1935 storage of inert ordnance materials (fuses, bomb casings, wooden containers, and cartridge cases) suggests possibility of MEC.
 - ▶ Reproduction office with blueprint machines, dark rooms, and sinks.
 - ▶ 1946 referred to as the packing and shipping shed.
 - ▶ 1946 stored wrenches, ordnance tools, and shovels.
 - ▶ 1963 area was surface cleared during closure of the arsenal and covered by original structures.
- Building 203:
 - ▶ 1935 used as storage of inert ordnance materials including fuses, bomb casings, wooden containers, and cartridge cases.
 - ▶ A pit of unspecified size was located along a steam pipe trench at an unknown location within the building.
 - ▶ A railroad line ran between former Buildings 202 and 203.
 - ▶ The area between former Buildings 202 and 203 has been filled with brick, concrete, and other building demolition debris by EPA.



Investigation Areas Summary

Area 18F: Former Warehouses (continued)



Investigation Areas Summary

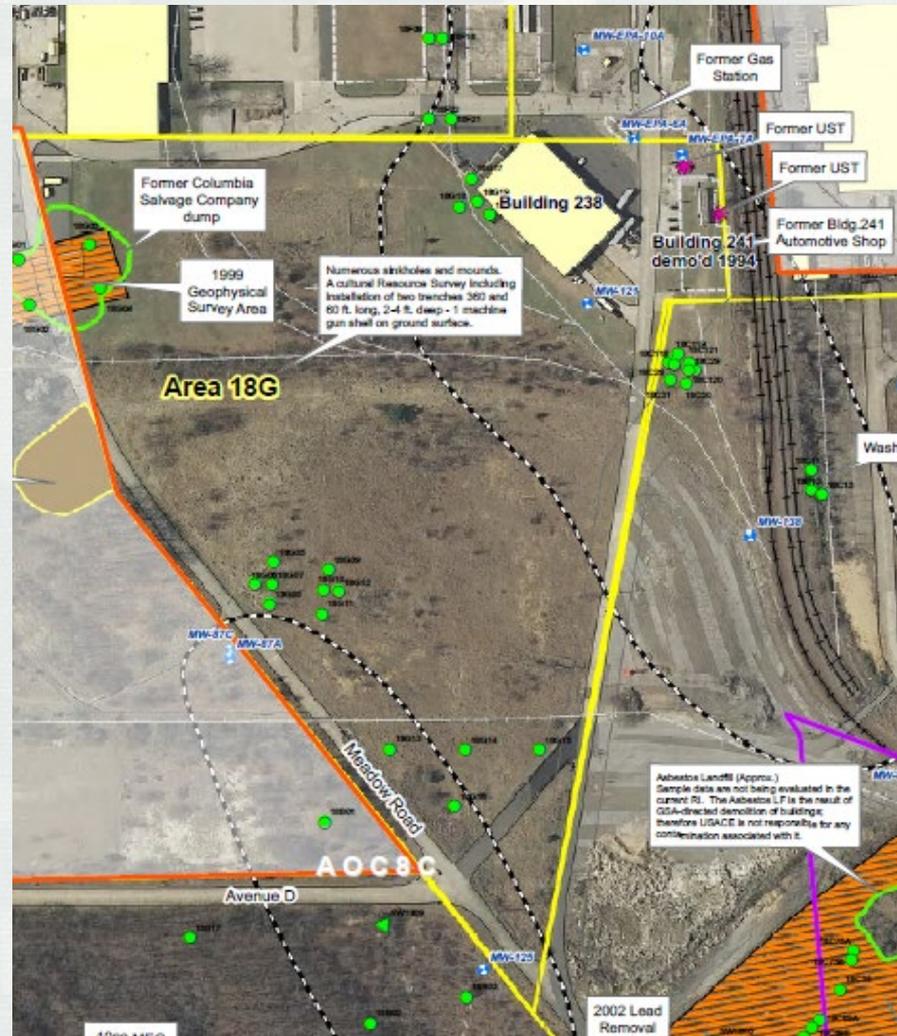
Area 18G: Former Dump

- Approximately 21 acres
- Historical uses:
 - ▶ Equipment storage
 - ▶ Gasoline station storage building and automotive shop located near the northern corner, construction/removal dates unknown. Station was actively used by EPA/GSA into the 1980s and 2 USTs removed by EPA in 1991.
 - ▶ Dump reportedly used by Columbia Salvage Company to dispose of scrap material generated during historical ammunition salvage operations that began in 1919. Complete timeframe unknown.



Investigation Areas Summary

Area 18G: Former Dump (continued)



Remedial Investigation (RI)

- Identify source(s) of contamination
- Characterize nature and extent of contamination
- Understand fate and transport of contaminants
- Human health and ecological risk assessments
- Geophysical and MEC surveys

- FOCUS:
 - ▶ HTW contamination in sediment and soil
 - ▶ Presence and potential of finding MEC associated with historical DoD activities.



U.S. EPA/GSA Area AOC Sampling Locations



Risk Assessments

- Human Health Risk Assessment (HHRA)
- Ecological Risk Assessment
 - ▶ Screening-level Ecological Risk Assessment (SLERA)
 - ▶ Baseline Ecological Risk Assessment (BERA)

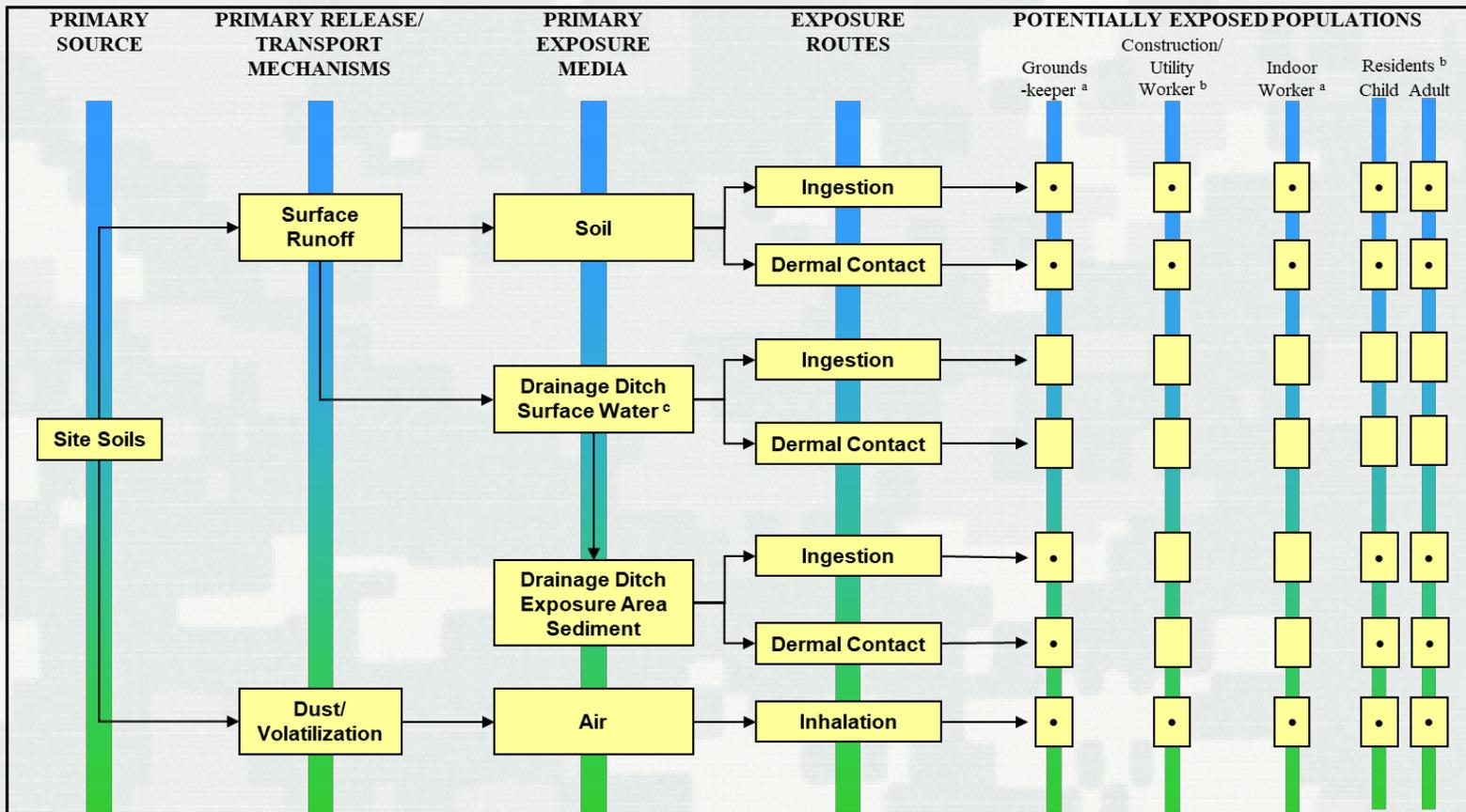


HHRA

- HHRA
 - ▶ Two exposure areas
 - Soil exposure area
 - Sediment exposure area (drainage ditches)
 - ▶ Considered current and potential future use of the U.S. EPA/GSA Property
 - ▶ Calculated "Cancer Risks" and "Noncancer Hazard Indices".



Human Exposures



LEGEND:

^a Assumed exposure to surface soil (0-2 ft bgs).

^b Assumed exposure to aggregate soil (0-10 ft bgs).

^c Surface water in the drainage ditches is shallow and is present only after precipitation events. The water dries up during periods without precipitation. Based on this, there is limited exposure potential.

FUDS Project Number C02NJ0084-15

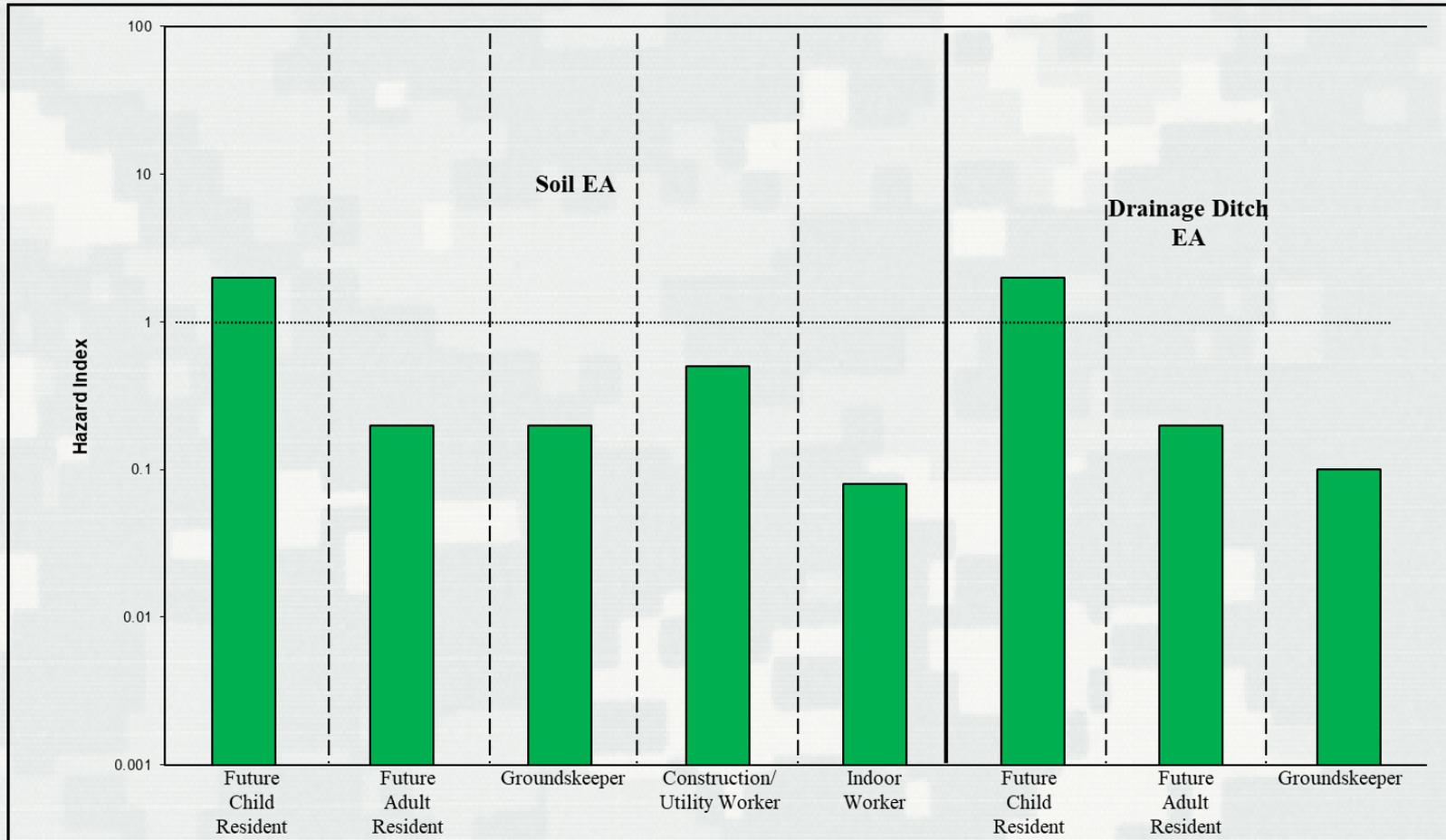


Interpreting HHRA Results

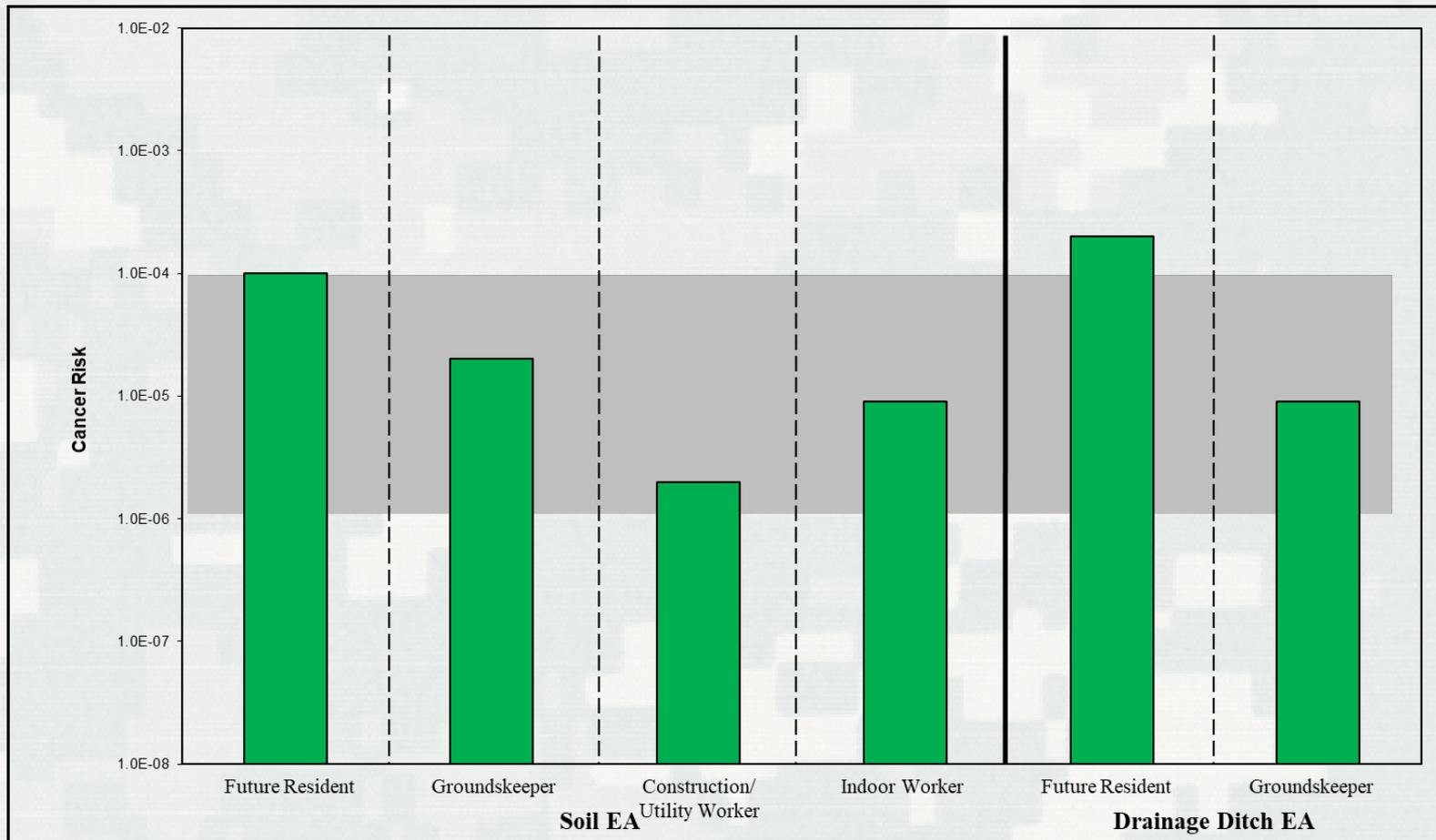
- CERCLA's acceptable excess lifetime cancer risk range:
 1×10^{-6} to 1×10^{-4}
(Stated as a 1 in a million chance to a 1 in 10,000 chance)
- Threshold for noncancer health effects:
Hazard Index < 1.0
- USACE is responsible for risks based on historical U.S. Army operations.



HHRA Results – Noncancer



HHRA Results – Cancer Risks

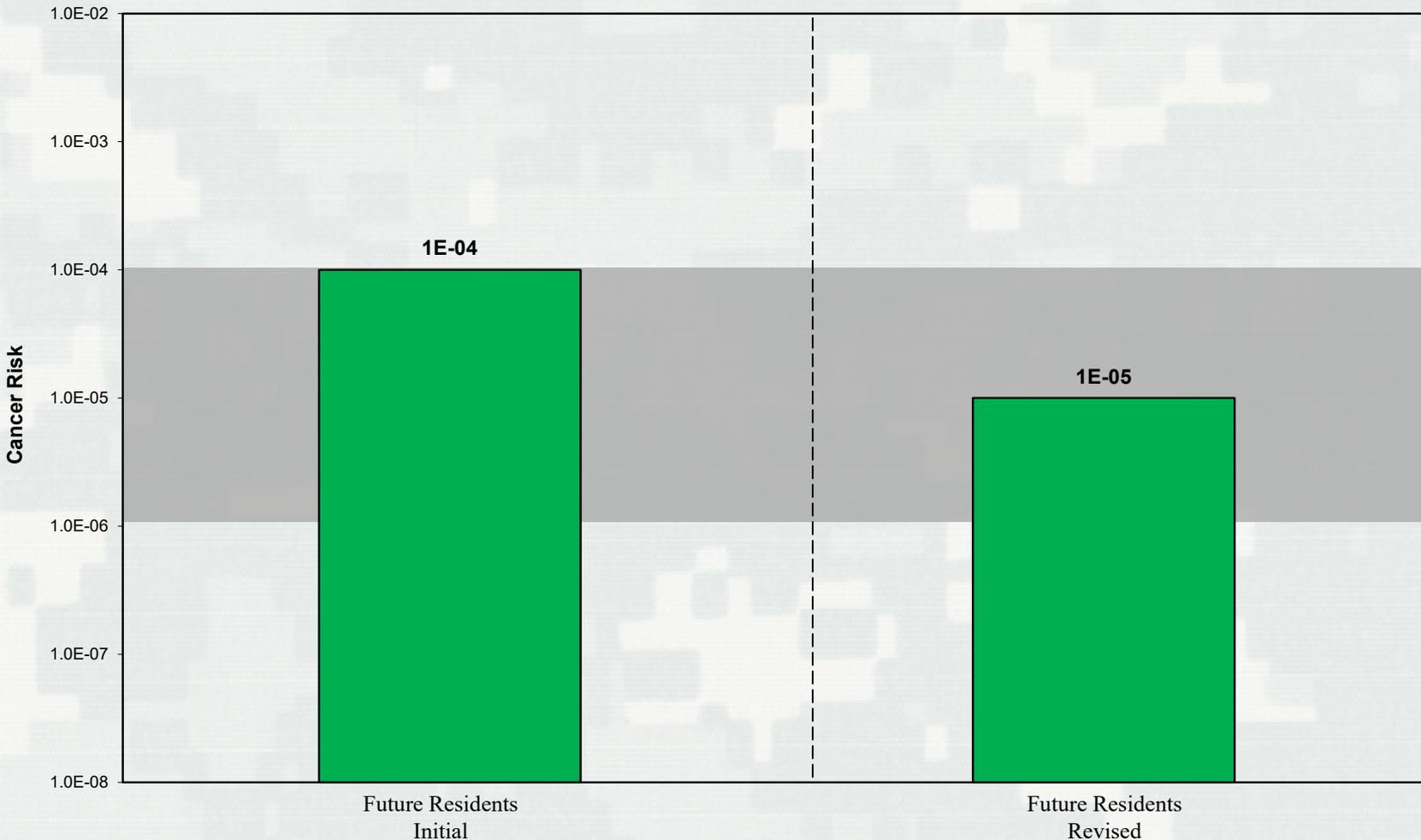


Risk Drivers

- Marginally exceed thresholds
- Not attributable to past DoD activities
 - ▶ PAHs – highest concentrations in GSA landfill
 - ▶ Arsenic – higher concentrations along former rail line
 - ▶ Chromium
 - higher concentrations along former rail line
 - unlikely in hexavalent state



Soil Exposure Area – Final Cancer Risks – Hypothetical Future Residents



SLERA

- Site-wide screening level ecological risk assessment
 - ▶ Soil
 - ▶ Surface water
 - ▶ Sediment
- Investigation Area 1
 - ▶ No detects greater than the most stringent NJDEP criteria available
 - ▶ Not addressed in the BERA
- Area 18
 - ▶ Screening indicated potential adverse effects
 - ▶ Addressed in the BERA



BERA

- Soil exposure
 - ▶ Terrestrial habitats
 - developed land
 - old field
 - disturbed old field
 - forested upland
- Sediment exposure
 - ▶ Freshwater aquatic habitats
 - ▶ Limited to drainage ditches
 - ▶ Within the Red Root Creek Drainage (Drainage Area 3)



BERA (continued)

- Terrestrial evaluations included:
 - ▶ Comparison of Site concentrations to benchmarks to calculate "Hazard Quotients"
 - ▶ Earthworm bulk-soil toxicity bioassays
 - ▶ Comparison of Site tissue concentrations to reference concentrations
 - ▶ Small mammal histology
 - ▶ Food chain exposure modeling & calculation of "Hazard Quotients".



BERA (continued)

- Aquatic evaluations included:
 - ▶ Comparison of Site concentrations to benchmarks to calculate "Hazard Quotients"
 - ▶ Benthic macroinvertebrate community analysis
 - ▶ Benthic macroinvertebrate bulk-sediment toxicity bioassays
 - ▶ Comparison of Site tissue concentrations to reference concentrations
 - ▶ Food chain exposure modeling and calculation of "Hazard Quotients".



RI Conclusions

HHRA Results Summary:

- Estimates using all data resulted in future residential cancer risks and noncancer hazard indices slightly above the acceptable levels due to the following risk drivers:
 - ▶ carcinogenic PAHs in both the soil and sediment exposure areas; and
 - ▶ arsenic and chromium in the soil exposure area only.
- Carcinogenic PAHs are a result of non-DoD sources or within typical anthropogenic concentrations.
- Arsenic and chromium are within naturally occurring concentrations.
- Chromium was evaluated using overly-conservative assumptions.

HHRA Conclusions:

- Estimates using only data potentially attributable to DoD-related CERCLA releases resulted in future residential cancer risks within the acceptable risk range.



RI Conclusions (continued)

Ecological Conclusions:

- No ecological risks attributable to DoD activities identified.

No Further Action required for HTW contamination in soil/sediment → supported by:

- Results of the human health and ecological risk assessments.



RI Conclusions (continued)

MEC Conclusions:

- No MEC discoveries in geophysical and MEC surveys performed in the EPA/GSA Area.
- Items found are munition debris and not MEC (expended bullets, inert projectile, and empty machine gun shell).
- USACE believes no MEC issues associated with the EPA/GSA Area requiring additional investigations or evaluation remain.

No Further Action required for MEC → supported by:

- Lack of MEC finds throughout the investigatory work is supported by the general historical use of the areas.



Proposed Plan (PP) and Next Steps

- No Further Action required for:
 - ▶ HTW soil/sediment contamination
 - ▶ MEC
- Final PP subject to the 33-day public review period concurrent with regulatory agency review
 - ▶ Public review comment period 12 January – 14 February 2022.
 - ▶ More information on website:
<https://www.nan.usace.army.mil/Missions/Environmental/Environmental-Remediation/Formerly-Used-Defense-Sites/Former-Raritan-Arsenal/>
- Responsiveness summary will be prepared and incorporated into the final Decision Document
 - ▶ Public comments and Agency comments



Comment Process

Written comments must be postmarked or emailed by the close of the public comment period on 14 February 2022.

By mail:

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Questions and Comments

- Unmute your phone or computer.
- Please state your name (and affiliation, if applicable) prior to your question or comment.

Thank you for your participation!

