FORMER MANASSAS AIR FORCE COMMUNICATION FACILITY INDEPENDENT HILL, VIRGINIA

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US Army Corps of Engineers®

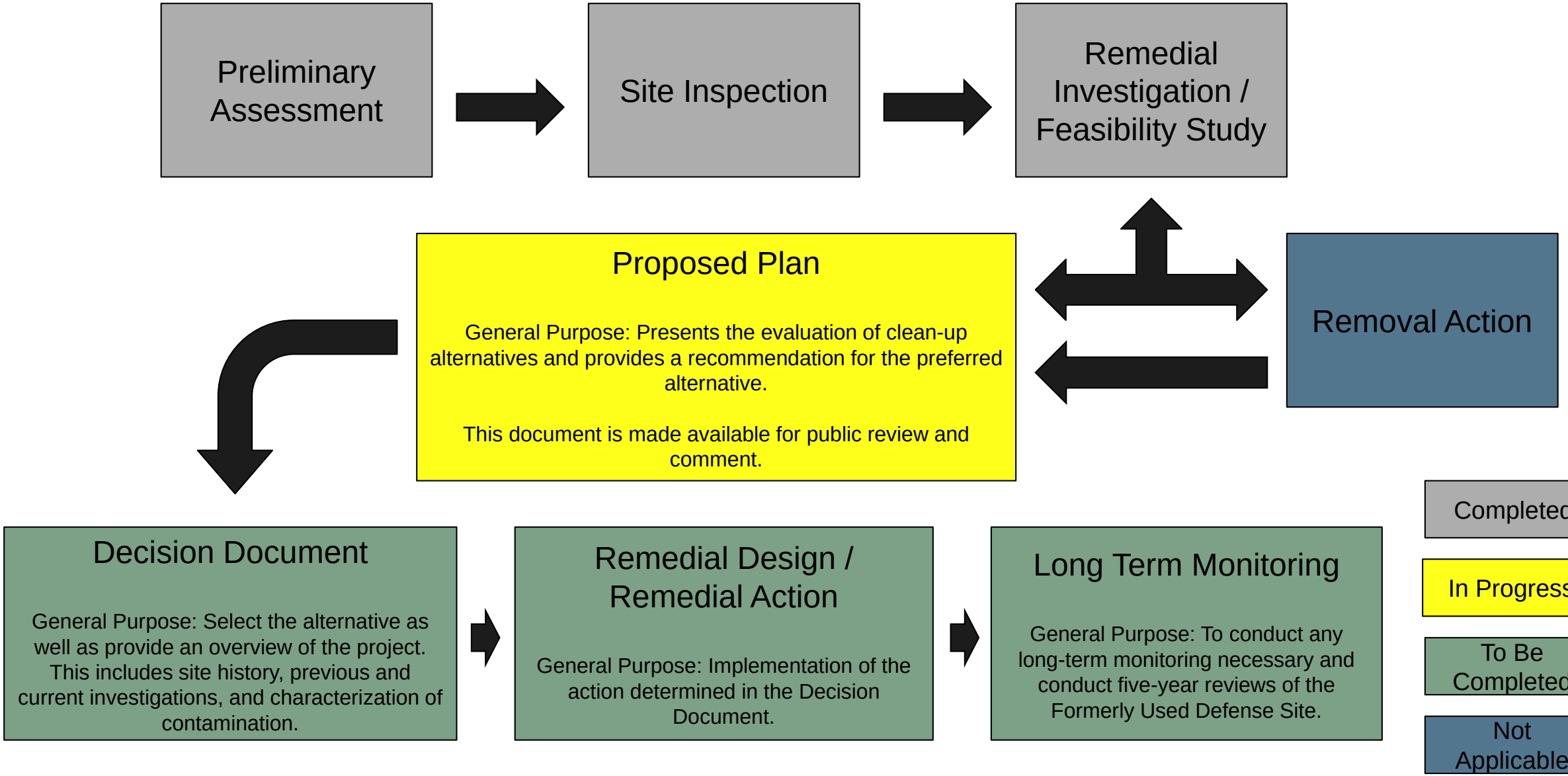
SITE LOCATION

The study area is located in Independent Hill, Virginia on State Route 619 at the intersection of State Route 646 in Prince William County, approximately 11 miles southeast of Manassas, Virginia.

SITE HISTORY

Date	Event
1943	Part of a 50,000 acre site acquired by DOD (further known as the Marine Corps Schools, Quantico, Virginia).
1946	Air Defense Command (ADC) was activated.
1951	Designated station of the 647th A.C.&W Squadron (ADC).
1952	April 11, 1952 (1330) the Independent Hill Site assumes operational status and becomes a radar station for the Eastern Air Defense Command.
1956	Air Force acquired 50.1 acres from the Navy.
1959	The aircraft control and warning station closed. Redesignated as the 647th Radar Squadron (SAGE)(ADC).
1964	Department of Defense declared the installation excess to the needs of the Air Force.
1968	Prince William County school board acquired the 45.18 acres for support functions, as well as education purposes.

THE CERCLA PROCESS PROGRAM



PREVIOUS STUDIES AND FINDINGS

- 1989 – Chlorinated Solvent contamination identified
- 1991 – Virginia Department of Health inspection performed. No imminent threat identified
- 1998–2010 – Multiple investigations completed by USACE through the FUDS Program
- 2013 - Remedial Investigation (RI) Report completed.
- 2015 - Supplemental Site Characterization completed to support Feasibility Study (FS)
- 2019 – FS completed, which evaluated remedial alternatives for groundwater

RISK ASSESSMENT AT MAFCF

- **Ecological risk assessment** was conducted on exposures to three media – soil, sediment, and surface water.
  - Risk to terrestrial species from exposure to soil is likely to be minimal for most communities due to the small area and degraded habitat of the MAFCF.
  - Risk to aquatic species from exposure to sediment and surface water is likely to be localized and have little effect on aquatic communities.

- **Baseline human health risk assessment** was conducted on exposure to five media – soil, sediment, surface water, soil gas, and groundwater.

  - Exposures to sediment, surface water, and soil did not result in exceedance of human health risk levels.
  - Hypothetical exposure to soil gas resulted in exceedance of human health risk levels.
  - Hypothetical exposure to groundwater resulted in exceedance of human health risk levels.

VAPOR INTRUSION RISK EVALUATION

- Because the RI identified vapor intrusion of soil gas into site buildings as a potential concern, additional sub-slab soil gas samples were collected during the SSC.

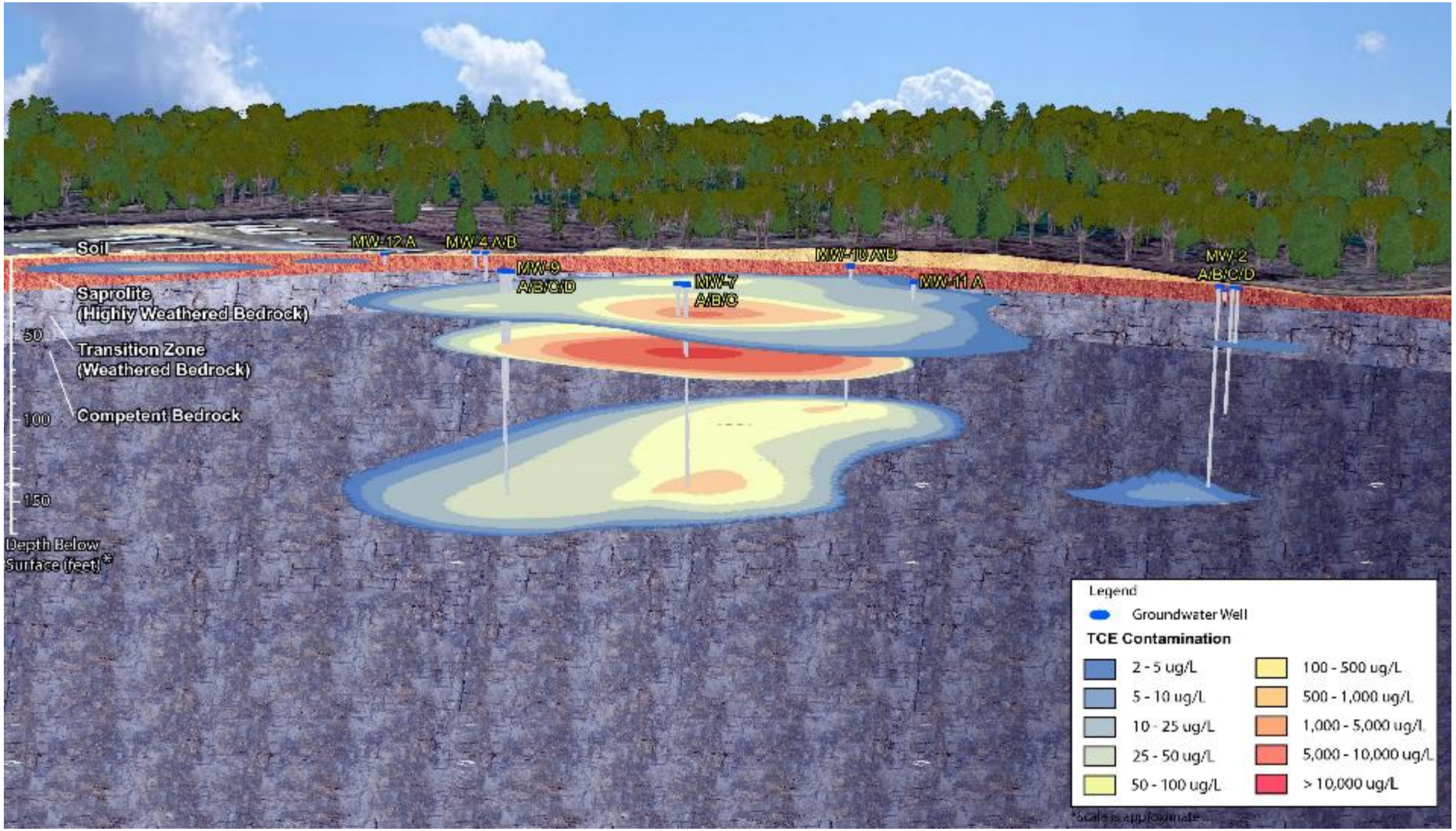
- USACE evaluated the conservative hypothetical exposure scenario of a resident living inside a building directly over the contaminated groundwater. The risk assessment concluded that exposure to gas emanating from below a possible future residence would not present unacceptable risks

GROUNDWATER EXPOSURE EVALUATION

- Remedial action is required to address the hypothetical risk caused by possible future ingestion of contaminated groundwater.
- This PP was written to address groundwater contamination.

GROUNDWATER CONCEPTUAL SITE MODEL

- **Contamination sources**
  - Dumping and disposal were suspected to lead to source formation.
  - Most likely sources are disposal activities near MW-7 cluster.



GROUNDWATER CONCEPTUAL SITE MODEL

❑ Contamination migration paths

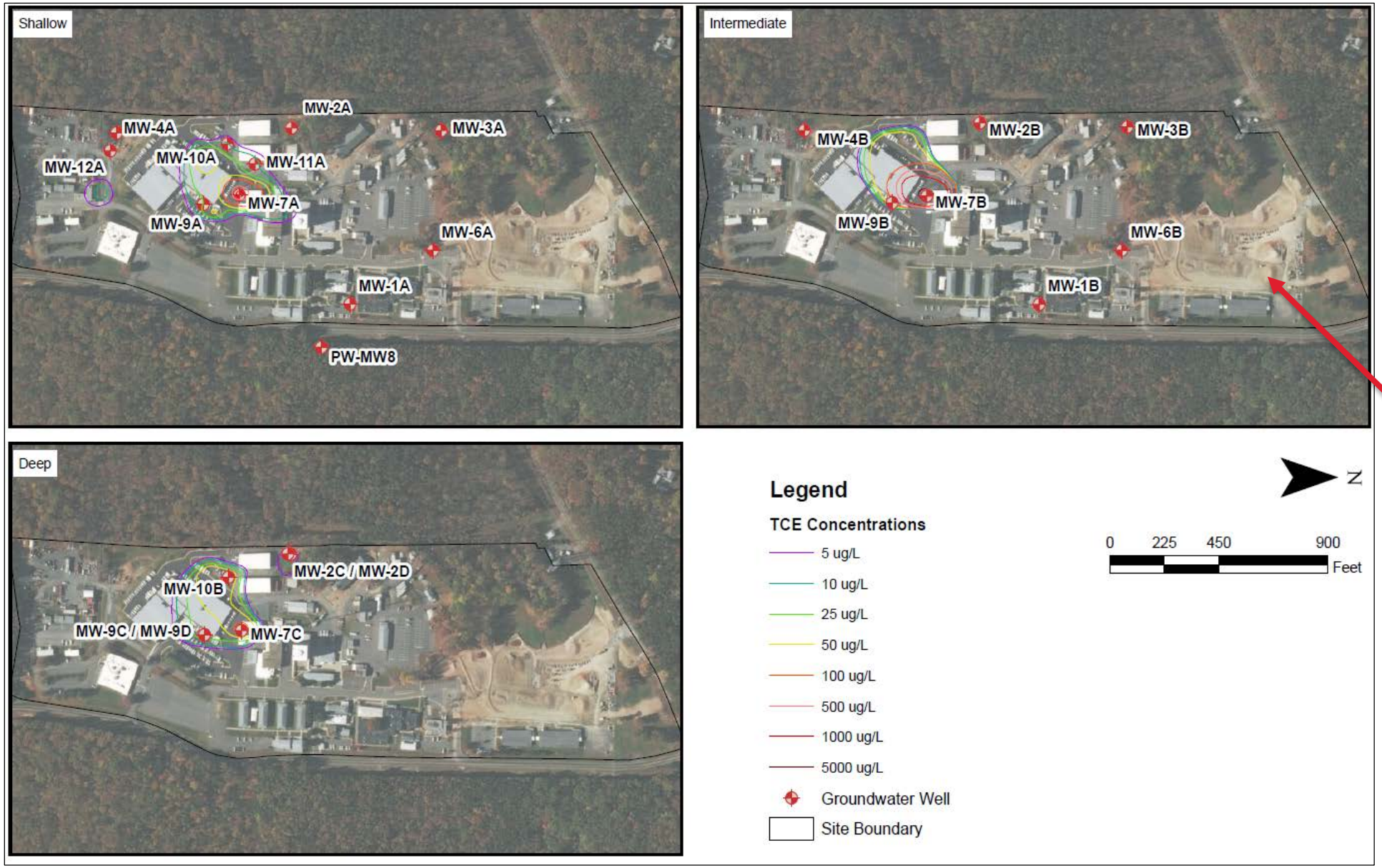
Groundwater and associated contaminants are present in and move through three different types of rocks at different depths:

- Shallow saprolite (10 to 42 ft below ground surface [bgs])
- Intermediate transition zone (42 to 90 ft bgs)
- Deep bedrock (85 to 170 ft bgs)

❑ Receptors

- The site is currently owned and operated by PWCS as the Independent Hill Complex. Future land use of the site is expected to remain unchanged.
- No residents are currently present on the MAFCF property.
- No drinking water supply wells are currently present on the MAFCF property.

EXTENT OF CONTAMINATION



Independence Nontraditional School

CONSTITUENTS OF CONCERNS IN GROUNDWATER

COC	Maximum Concentration (µg/L)	USEPA Maximum Contaminant Levels (MCL) (µg/L)
PCE	8.36 (MW-9C)	5.0
TCE	10,500 (MW-7B)	5.0
cis-1,2-DCE	4,530 (MW-7B)	70
1,2-DCE (Total)	4,530 (MW-7B)	cis-1,2-DCE: 70 trans-1,2-DCE: 100
1,1-DCE	147 (MW-7B)	7.0
1,2-DCA	12.2 (MW-7C)	5.0
1,1-DCA	196 (MW-7B)	28 (USEPA Tapwater RSL)
VC	12.9 (MW-7A)	2.0

Note:

- PCE was not identified as a COC in the RI Report, but was added as a COC based on screening level exceedances in the two recent SSC groundwater monitoring events.

- Additionally, benzene was identified as a COC in the RI Report based on detections at well MW-7A. However, there have been no detections of benzene above screening levels in the two recent SSC groundwater monitoring events; therefore, benzene was not retained as a COC.

- 1,2-DCE (Total) consists of cis-1,2-DCE and trans-1,2-DCE. USEPA does not publish an MCL for 1,2-DCE (Total).

REMEDIAL ACTION OBJECTIVES

- For protection of human health, prevent exposure to groundwater with contaminant levels greater than PRGs through ingestion, inhalation, and dermal contact.
- Prevent off-site (beyond the property boundary) migration of the groundwater contaminant plume to the MCB Quantico property at concentrations above the PRGs.

Definition of preliminary remediation goals (PRGs)

The PRGs are based upon the values of the USEPA Maximum Contaminant Levels (MCLs) and the EPA Region III Tapwater RSL (1,1-DCA).

- PCE: 5.0 µg/L
- TCE: 5.0 µg/L
- cis-1,2-DCE: 70 µg/L
- trans-1,2-DCE: 100 µg/L
- 1,1-DCE: 7.0 µg/L
- 1,2-DCA: 5.0 µg/L
- 1,1-DCA: 28 µg/L
- VC: 2.0 µg/L

ALTERNATIVE ANALYSIS

- ❑ Alternative 1: No Action
- ❑ Alternative 2: Monitored Natural Attenuation (MNA)
- ❑ Alternative 3: in-situ enhanced biodegradation (ISEB) in Source Areas
- ❑ Alternative 4: in-situ chemical oxidation (ISCO) in Source Areas
- ❑ Alternative 5: ISCO in Source Areas Followed with ISEB in Plume Areas
- ❑ Alternative 6: Groundwater Extraction & Treatment in Source Areas

ALTERNATIVE ANALYSIS

EVALUATION CRITERIA

NCP lists 9 criteria against which each remedial alternative must be assessed.

Two threshold criteria that must be met by each alternative:

- Protection of human health and the environment
- Compliance with ARARs

Five primary balancing criteria upon which the analysis is based on:

- Long-term effectiveness and permanence
- Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment
- Short-term effectiveness
- Implementability
- Cost

Two modifying criteria that evaluate state and community acceptance:

- Regulatory acceptance
- Community acceptance

PREFERRED ALTERNATIVE

ALTERNATIVE 5: ISCO IN SOURCE AREAS FOLLOWED WITH ISEB IN PLUME AREAS

- **ISCO in Source Areas**
  - Chemical oxidation uses chemicals called “oxidants” to help change harmful contaminants into less toxic ones.
  - ISCO treatment would focus on the source area in the vicinity of cluster wells MW-7.

- **ISEB in Plume Areas**
  - Bioremediation techniques stimulates microorganisms to grow and use the contaminants as a food and energy source by creating a favorable environment for the microorganisms.
  - Focus areas would be downgradient of MW-7 and in the vicinity of cluster wells MW-2.

- **Monitored Natural Attenuation (MNA)**
  - MNA relies on natural processes to decrease or “attenuate” COCs in groundwater.
  - COCs are monitored regularly, together with MNA parameters.
  - Multiple lines of evidence suggest that natural attenuation has occurred at the site.

- **Land Used Control (LUC)**
  - Implementation of LUCs will limit public exposure to contaminated groundwater during the remediation processes.
  - PWCS is willing to implement a Uniform Environmental Covenants Act (UECA) agreement as the LUC measure to ensure that no drinking water wells are installed on the property.
  - USACE has coordinated with USACE Office of the Chief Counsel (CECC-E) and received concurrence on 24 February 2020 for including the UECA as part of the preferred alternative.

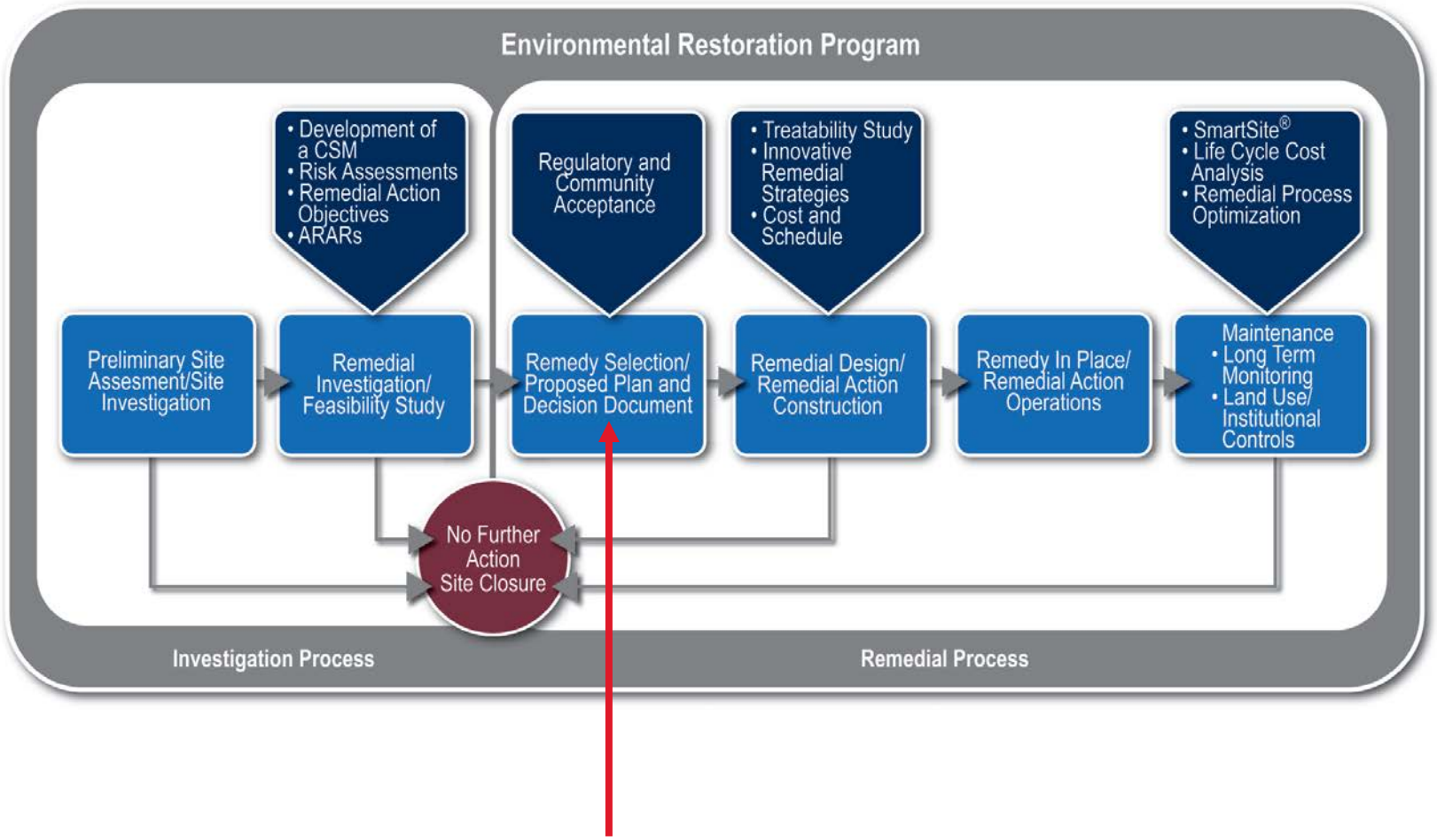
PREFERRED ALTERNATIVE

ACTIVE RESPONSE ACTIONS

- Both ISEB and ISCO approaches would be moderately complex to implement at the site.
- A remedial design would be needed to implement the alternative.
- More importantly, because of the heterogeneous conditions of the aquifer, a pre-remedial design study would be necessary in order to determine the appropriate amendments, required doses, buffer solutions, and injection volumes to use to treat the groundwater.
- Effectiveness of the ISEB/ISCO in reducing COCs, in particularly TCE concentrations in the groundwater would be monitored regularly.
- MNA monitoring program would be implemented after remedial action completion.
- Statistical methods would be used to characterize decreasing trends of COCs at specific locations, as well as statistically determine any change over time to the overall shape of the plumes.
- Implement the UECA agreement as the LUC measure to ensure that no drinking water wells are installed on the property.
- The implementation of the preferred remedial alternative would be considered complete once concentration data indicates that all COCs are at or below PRGs in all groundwater sampling locations. Because this alternative would result in contaminants remaining within groundwater at the site above proposed cleanup levels prior to completion, CERCLA requires that the site be reviewed at least once every five years to ensure the protectiveness of the remedy.

NEXT STEPS

- Public can submit comments on the Proposed Plan and its recommendation through (October 2, 2020)
- The U.S. Army Corps of Engineers will review comments submitted and develop a Decision Document outlining the final decision on a path forward
  - Responses to any submitted comments will be included as a Responsiveness Summary and appended to the Decision Document.



Develop a Decision Document

QUESTIONS?

The Corps of Engineers will continue accepting public comments on the Proposed Plan until the public comment period ends on October 2, 2020. Comments can be submitted in writing this evening or submitted via traditional mail or e-mail:

Written comments can be sent to the following mailing address:
Brent Graybill, PM
USACE-Baltimore District
2 Hopkins Plaza
Baltimore, Maryland 21201

Or e-mailed to:
Brent.M.Graybill@usace.army.mil

Mailed letters must be postmarked by October 2, 2020.