



87th Air Base Wing



Joint Base McGuire-Dix-Lakehurst Restoration Advisory Board

26 Mar 2026

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Welcome and Introductions
Review of hybrid RAB meeting format

Mr. James Richman
Remediation Program Manager, AFCEC/CZRE

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Announcements & Availability



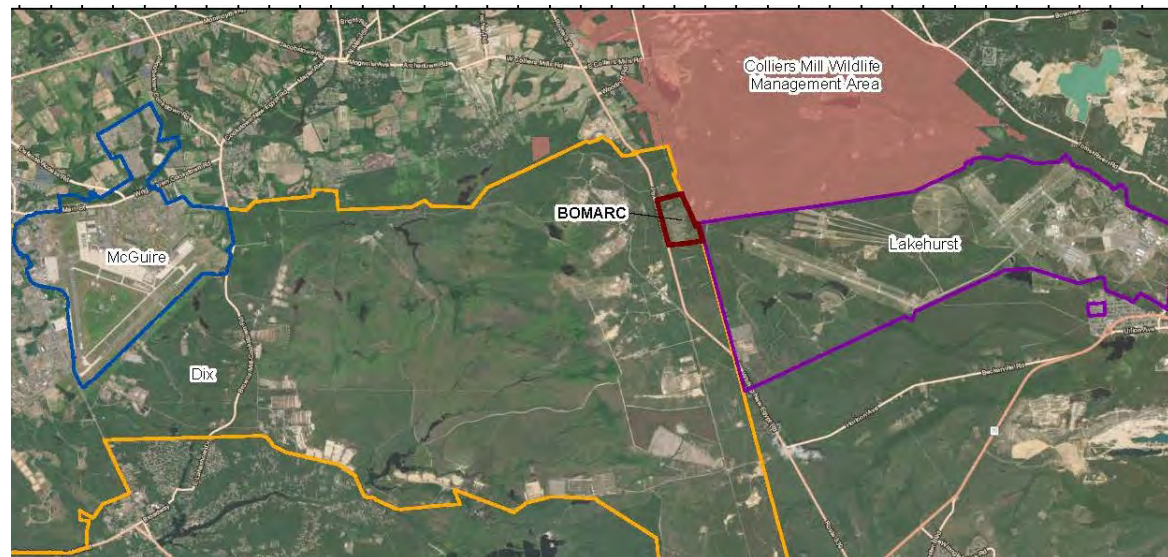
- **Public Notices (PN)**
 - Burlington County Times
 - Asbury Park Press
 - Pine Barrens Tribune
 - JB MDL RAB website: <https://envirorestorejbmdl.com/>
 - RAB presentation and minutes
 - PN
 - Limited CERCLA document requiring public notification
- **Document Availability:**
 - Burlington County Library (Westampton, NJ)
 - Ocean County Library (Toms River, NJ)
 - Air Force Administrative Record: <https://ar.cce.af.mil/>



Community Engagement Events



- **Last Restoration Advisory Board (RAB): 07 Aug 2025**
 - **Public Comments** were addressed at the meeting and included in the RAB minutes
 - **Action Item:**
 - **No specific action items** identified during RAB meeting
 - **Prior to RAB meeting**, the RAB co-chairs discussed the disposition of the former BOMARC Missile Launcher





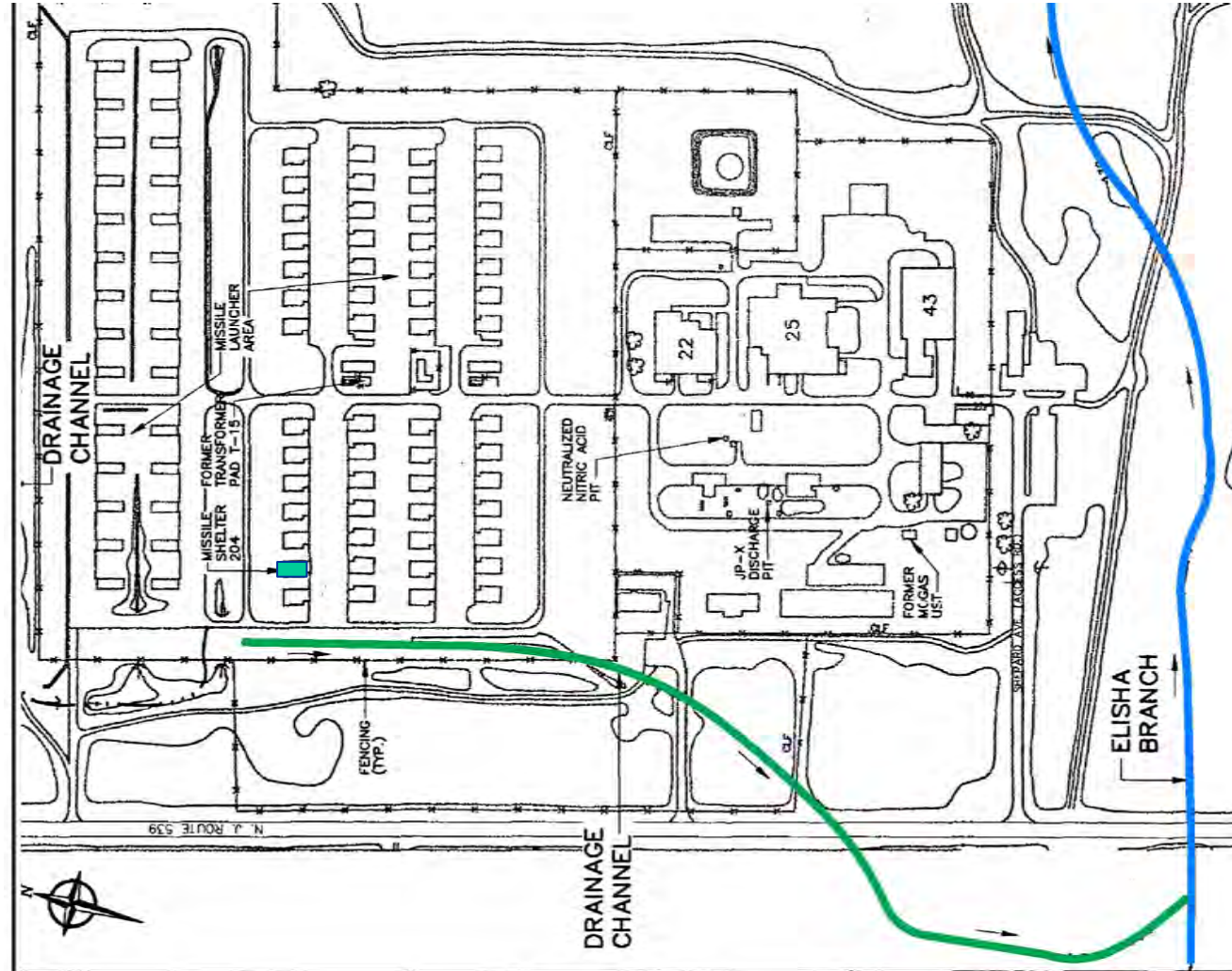
Action Item



- **Background BOMARC Missile Accident**
 - **June 7, 1960: Explosion of a helium tank in Shelter 204 ruptured JP-X fuel tank in launcher pit**
 - **Shelter housed nuclear-tipped, liquid filled BOMARC missile**
 - **Fire-fighting activities occurred for 15 hours**
 - **Release: weapons grade plutonium (^{239}Pu) fissile material from war head**
 - **Immediate emergency response in 1960 removed significant amounts of radioactive materials within the shelter**
 - **Primary mechanism: fire-fighting water containing ^{239}Pu migrated below shelter door, down asphalt apron into drainage ditch**
 - **COC remaining after initial accident response: maximum of 300-gram ^{239}Pu unrecovered**



BOMARC Site Map





Action Item



- **Disposition of BOMARC Missile Launcher (Site RW-01)**

- **Numerous investigations, surveys, and response action occurred from 1960 - 2007**
- **Record of Decision BOMARC RW-01; USAF, 20 Nov 1992; AR#209**
- **Public Health Assessment for BOMARC Missile Site; ATSDR, 23 Sept 2002; AR#1307**

Page 1, Summary: "Following a detailed review, ATSDR finds that the BOMARC site poses no threat to public health."

Page 12, Discussions: "Based on the interviews with Air Force retirees, it was determined that the missile wreckage was taken to a hangar at McGuire AFB for reconstruction and later shipped to Boeing Company in Seattle, Washington (USAF 1995a). The launcher from Shelter 204 was apparently cut into sections, removed, and brought to the Fort Dix scrap yard (later known as the Defense Reutilization and Marketing Office) prior to disposal at the Department of Energy's Idaho National Engineering and Environmental Laboratory (Case 2002). No definitive information exists on the disposal of the roof and door panels from the shelter. Personnel interviewed stated with certainty that no large debris from the accident, perhaps indicative of the roof and door panels, was buried within or near BOMARC (USAF 1995b)."

- **BOMARC Final Remedial Action Report, Site RW-01; USAF, 17 May 2010; AR#2244**

Page v, Executive Summary: "...disposition of the launcher from the missile involved in the accident is not known. Extensive magnetometry surveys conducted during the RI/FS and restoration activities throughout the 2000's failed to reveal information on its disposition. Thus, an on-site disposal is deemed improbable."

- **NJDEP RW-01 Unrestricted Use; NJDEP, 27 Mar 2012; AR#2245**



PLANNED PRESENTATION TOPICS



- **Military Munition Response Program (MMRP) Update**
- **PFAS – General Investigation / Off-base Drinking Water**
- **Optimized Remediation Contract (ORC) – Active Treatment Systems**
 - **BOMARC**
 - **TU003**
 - **OU4**
 - **Lakehurst Sites including TT013, TT017, and LF042**
 - **Status of Rebound Studies and Proposed PAC Injections**



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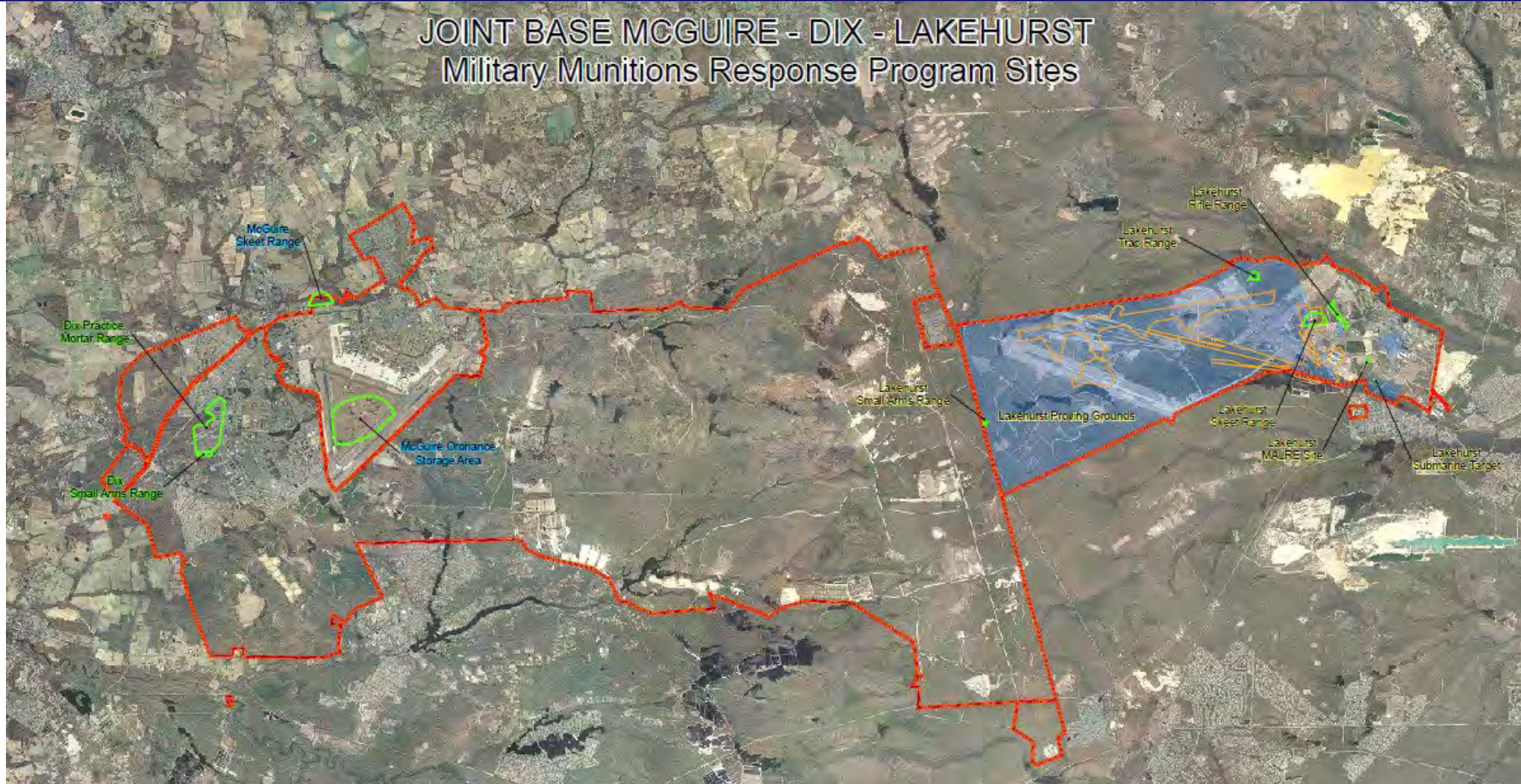
Joint Base McGuire-Dix-Lakehurst Military Munitions Response Program (MMRP) Site Update

**Mr. Michael Figura
Remediation Program Manager, AFCEC/CZRE**

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JBMDL MMRP Sites



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MMRP Site Status



■ McGuire Sites:

- Skeet Range (TS875, TS875A, TS875B, TS875C) – Responses to regulatory comments and Draft-Final Feasibility Study to be submitted for regulatory review in 2026
- Ordnance Storage Area (XU874, XU874A) – Responses to regulatory comments and Draft-Final Feasibility Study to be submitted for regulatory review in 2026

■ Dix Sites:

- Small Arms Range (SR002) – Final Record of Decision for No Further Action - January 2022
- Practice Mortar Range (FR004) – Final Record of Decision - October 2022
Munition clearance to be performed in 2026 followed by land use controls

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MMRP Site Status (continued)



■ Lakehurst Sites:

- **Submarine Bombing Target (ZZ001) – Final Record of Decision – August 2023**
Surface clearance for munitions to be performed in 2026 followed by land use controls
- **Military Aircraft Launch and Recovery Equipment (ZZ002) – Final Proposed Plan – June 2025. No Action Record of Decision to be submitted in 2026**
- **Lakehurst Proving Grounds (ZZ003) – Surface Clearance to resume later in 2026**
Feasibility Study to be submitted in 2026
- **Small Arms Range (ZZ004) – Administrative Closure – January 2023**
- **Trap Range (ZZ005) – Co-located with ZZ003 and will be addressed with ZZ003**
- **Rifle, Pistol, and Skeet Ranges (ZZ006) – Proposed Plan to be submitted in 2026**

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**Joint Base McGuire-Dix-Lakehurst
Former Practice Mortar Range Munitions Response Site (FR004)**

**Mr. Michael Figura
Remediation Program Manager, AFCEC/CZRE**

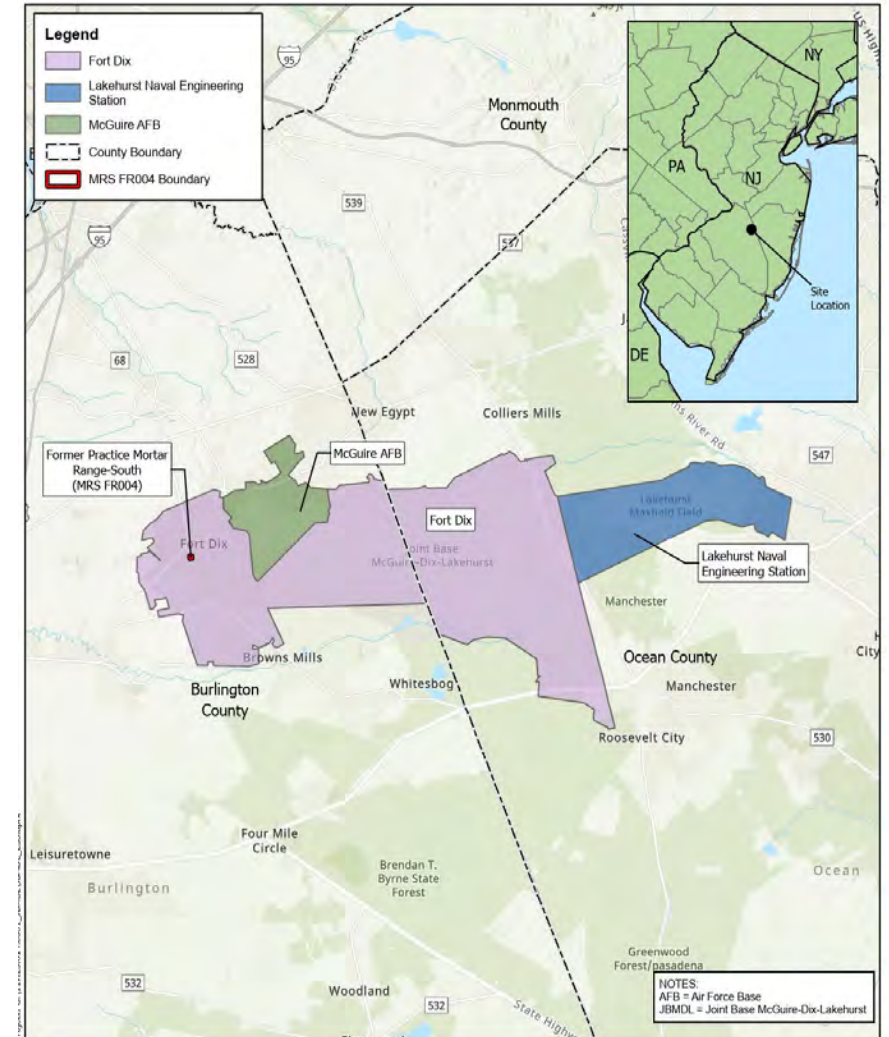
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Site History & Background



- MRS FR004 (51 acres) is in the western portion of the Joint Base McGuire-Dix-Lakehurst (JB MDL) Dix area
- The Former Practice Mortar Range (FR004) was initially identified as part of the 123-acre Practice Mortar Range Munitions Response Area (MRA) known as “Tent City,” reportedly used between the late 1940s and 1959.
- The 123-acre MRA was subdivided into two Munitions Response Sites (MRSs):
 - MRS FR004
 - MRS FR004a
- The Former Practice Mortar Site MRS FR004a (72 acres) has already been determined to require No Further Action as documented in a 2006 Record of Decision.



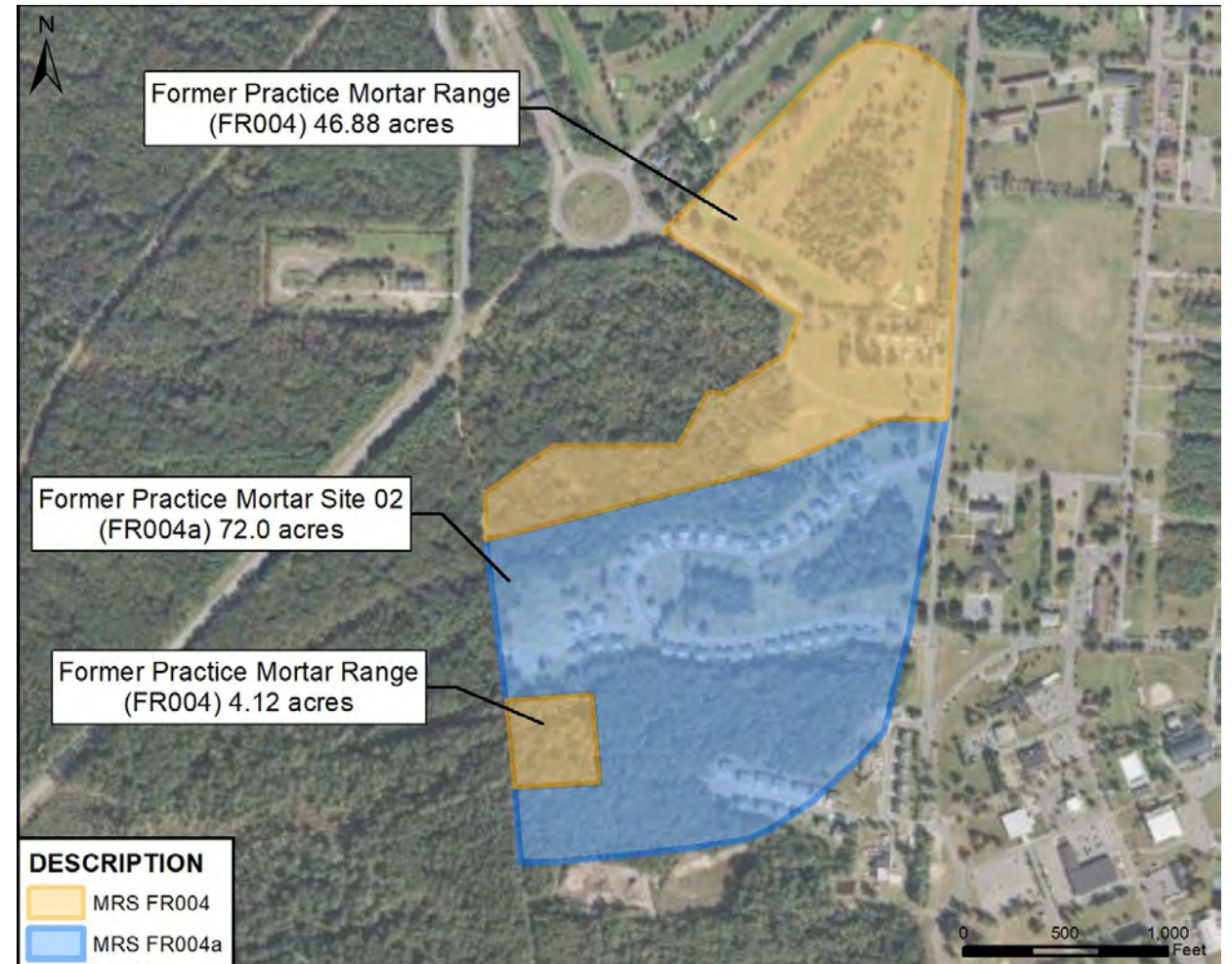
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Site History & Background



- **Munitions Response Site (MRS) FR004** comprised of two distinctly separate areas (shown in orange):
 - a 46.88-acre irregularly shaped area located to the north, and
 - a 4.12-acre wooded area located south-southwest of the Grove Park housing area.
- The northern portion of MRS FR004 (46.88 acres) is currently occupied by a portion of the Fountain Green golf course, recreational fields, and former Colonial Plaza housing area (no longer used for residential purposes).
- The southern portion of MRS FR004 (4.12 acres) is undeveloped, wooded land.



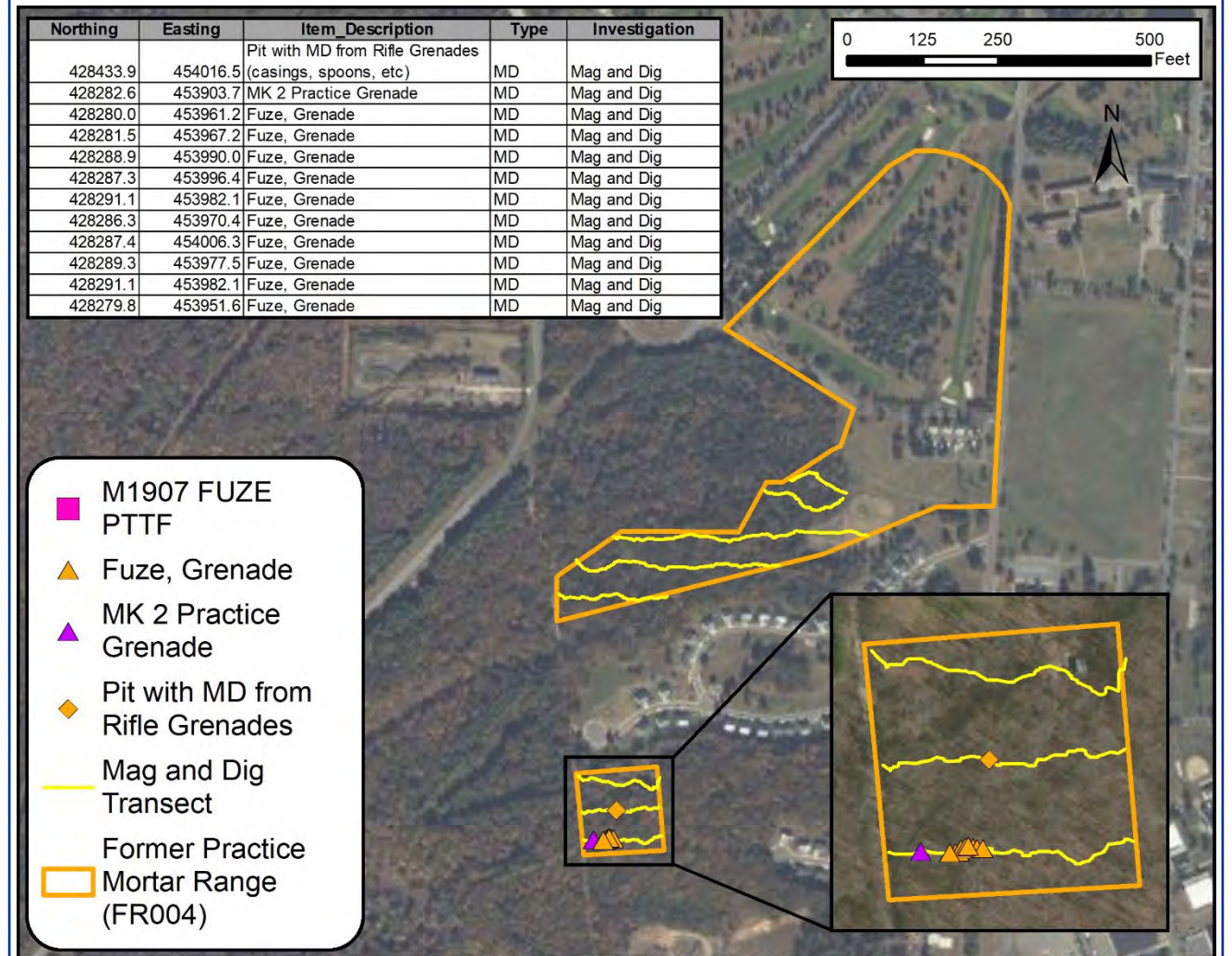


MRS FR004 Remedial Investigation



Remedial Investigation

- A magnetometer-assisted subsurface investigation (mag and dig) was conducted with transects along 1.05 miles.
- Subsurface investigation identified
 - ♦ munitions debris (MD)
 - ♦ non-munitions related debris (NMRD) small arms ammunition
- The MD found in the southern portion included
 - ♦ a pit of M11 practice rifle grenade components
 - ♦ ten (10) expended Mk II practice hand grenade fuzes
 - ♦ one (1) expended Mk II practice grenade



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MRS FR004 Remedial Investigation Results and Conclusions



- **No munitions or explosives of concern (MEC) or evidence of practice mortars were identified within Munitions Response Site (MRS) FR004.**
- **Munitions Debris (MD) items found related to historical training activities at the base were limited to the 4.12-acre southern portion of the MRS.**
- **No impacts from Mmunition Constituents (MC) were identified and no source of MC was found. No evaluation of groundwater was warranted.**
- **Feasibility Study indicated a potential risk that MEC may be present and recommended a remedial action since MD attributed to historical DoD activities were identified within the southern 4.12-acre portion of the MRS FR004.**



Selected Remedy for FR004: MEC Clearance



- **Munitions and Explosives of Concern (MEC) clearance and land use controls on the entire 4.12-acre southern portion of Munitions Response Site (MRS) FR004**
 - **Vegetation clearance of all trees/brush 4 inches or less in diameter**
 - **MEC clearance to be conducted using Advanced Geophysical Classification (AGC)**
 - **If MEC is found, it would be excavated by hand**
 - **MEC disposal (if present) would be conducted by either consolidating the MEC that are acceptable to move for demolition or blow-in-place for MEC that are not acceptable to move.**
- **Land Use Controls (LUCs) would be established on the southern 4.12-acre area**
 - **MEC clearance cannot prove to 100% certainty that no MEC will remain**
 - **Notification of the potential presence of MEC would be retained in the Base Master Plan and evaluated through the Dig Permit process**
 - **Five Year Reviews**
- **No action required in the 46.88-acre northern portion of the MRS**

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**Joint Base McGuire-Dix-Lakehurst
Former Submarine Bombing Target Munitions Response Site (ZZ001)**

**Mr. Michael Figura
Remediation Program Manager, AFCEC/CZRE**

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Site History & Background



- **MRS ZZ001 is approximately 13 acres in size and is located in the southeastern portion of the Lakehurst Area of JBMDL.**
- **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 WWII.**
- **Pilots also released miniature bombs from airships for training purposes.**



Site History & Background



- MEC and MD recovered at MRS ZZ001 include MK15 Mod 2, 100-lb practice bombs; MK23, 3-lb practice bombs; and MK5, practice bombs.
- MD 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.



MRS ZZ001 Investigations



- During the RI, 75 MEC and 33 MD items were discovered in soil down to a depth of 48 inches. The highest concentration of MEC and MD were situated in the southern portion of the site.
- No other explosives constituents or MC were detected in soil or groundwater at MRS ZZ001.
- During the RI, 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.



MRS ZZ001 Previous Investigations



Recovered MEC (MK23 3-lb Practice Bombs and MK5 Practice Bombs with MK4 Signal Cartridges)



Recovered MD



MD – munitions debris

MEC – munitions and explosive concern

MRS – Munitions Response Site

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MRS ZZ001 Previous Investigations



MD – munitions debris

MEC – munitions and explosive concern

MRS – Munitions Response Site

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Selected Remedy: LUCs with MEC Surface Clearance



- Includes Land Use Controls (LUCs) as well as:
 - Limited vegetation removal
 - MEC Surface Clearance
 - Visual and instrument-guided MEC detection and geospatial positioning
 - Recurring surface MEC removal by hand excavation (every 5 years)
 - Proper destruction of MEC and subsequent off-base disposal of any resulting remnants or MD determined to be safe
 - Annual LUC Inspections
 - CERCLA five-year reviews





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**Joint Base McGuire-Dix-Lakehurst
Lakehurst Proving Grounds (ZZ003)
Chemical Munition Storage and Disposal**

**Mr. Michael Figura
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ZZ003 - Lakehurst Proving Grounds Time Critical Removal Action (TCRA)



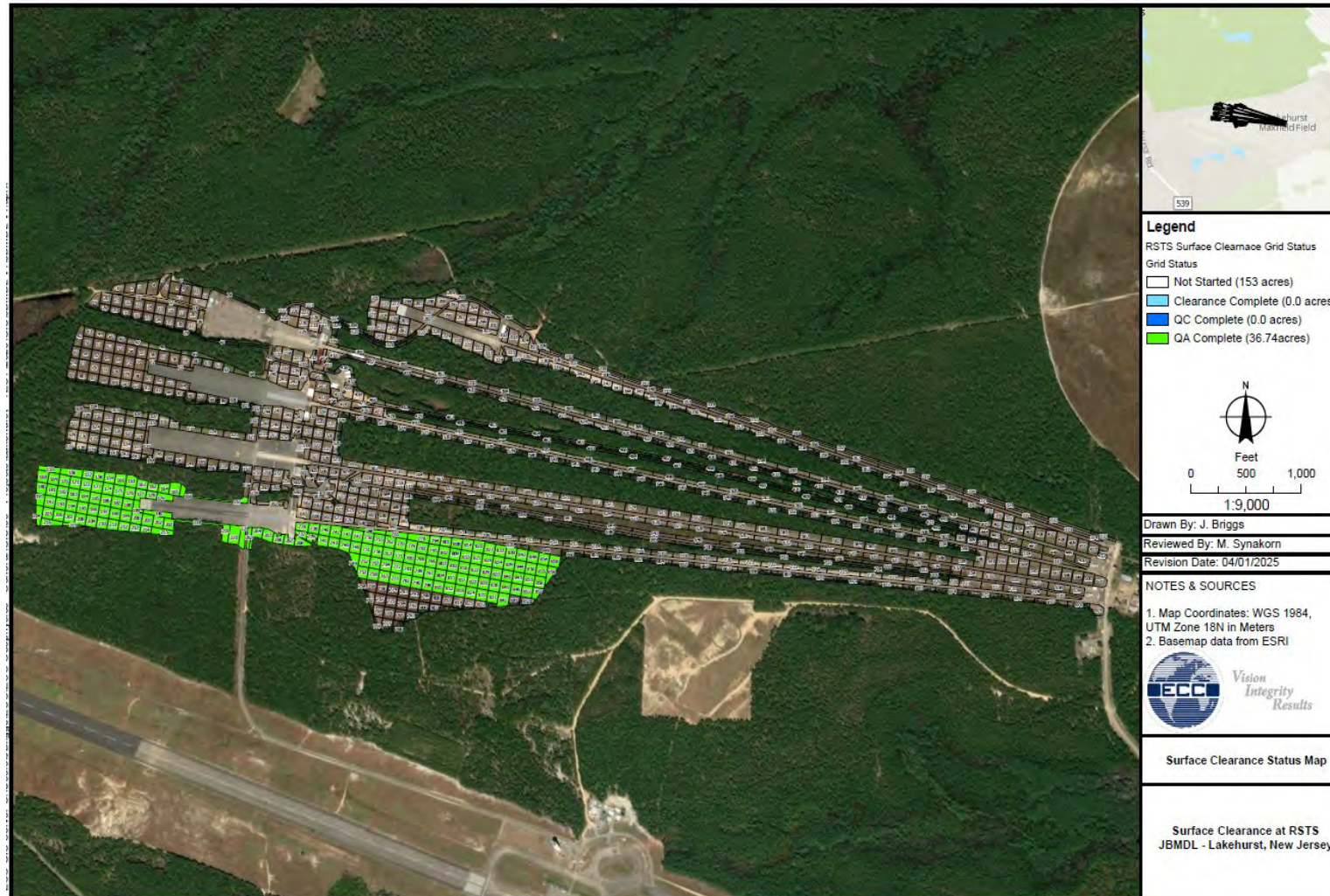
Objective: To identify and remove any munitions and explosives of concern (MEC) at or on the ground surface at the Lakehurst Test Track Area



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ZZ003 - Lakehurst Proving Grounds Surface Clearance Status as of 4/7/2025



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ZZ003 - Lakehurst Proving Grounds Time Critical Removal Action Findings



- **Mark II 75 mm Projectile Found March 24, 2025**
- **Army Material Assessment Review Board (MARB) determined projectile contains CNS (a tear agent containing a mixture of chloroacetophenone, chloropicrin, and chloroform)**
- **Packaged in Multiple Round Container (MRC) and stored in the Interim Holding Facility (IHF)**
- **MARB recommended treatment of item found on-site via Explosive Destruction System (EDS) which is planned for deployment to JBMDL May/June 2026**



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Interim Holding Facility



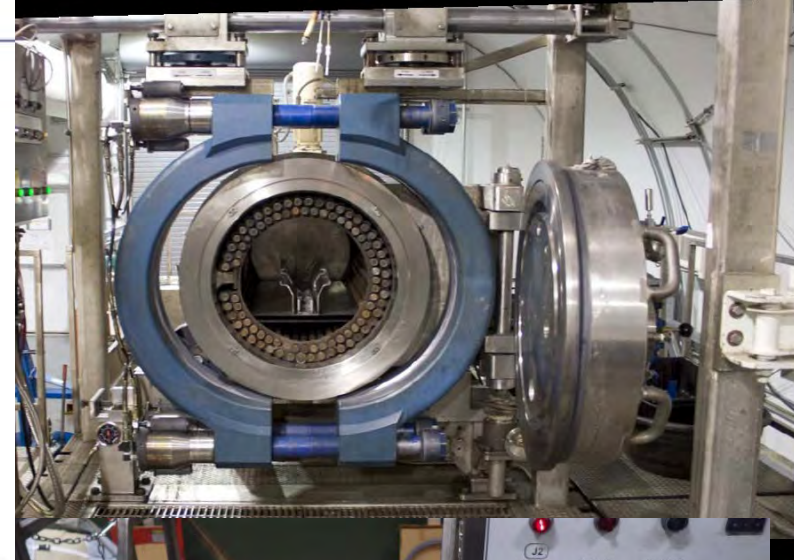
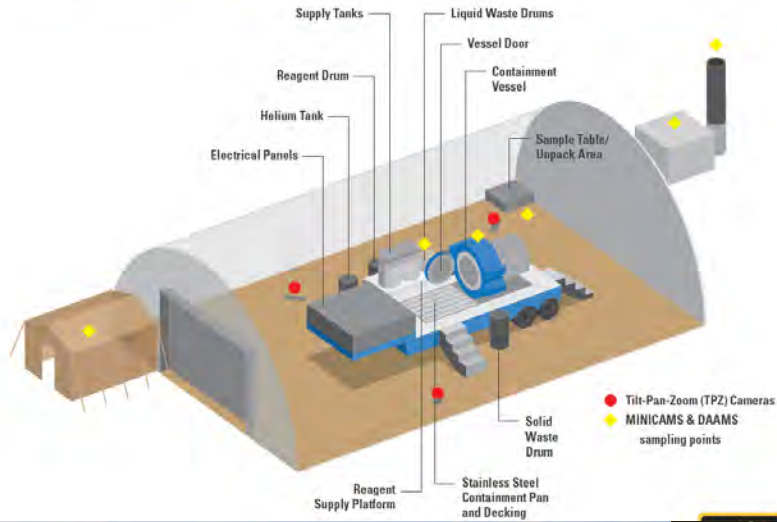
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Explosive Destruction System



TYPICAL EDS SITE LAYOUT (INTERIOR)



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QUESTIONS?

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Joint Base McGuire-Dix-Lakehurst PFAS Investigation & Off-base Drinking Water Update

**Mr. James Richman
Remediation Program Manager, AFCEC/CZRE**

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Air Force Goals



- AF is taking proactive steps to address PFOS/PFOA associated with mission-related AFFF releases
- Goal is to protect human health and ensure access to safe drinking water for installation and supporting communities
- Comprehensive approach – identify, respond, prevent – to assess the potential for PFOS/PFOA in drinking water, on and off the installation, and respond appropriately
 - AF has reviewed existing PFAS sampling results, will be expanding existing cleanup investigations, assessing “background” levels of PFAS, and providing drinking water treatment for impacted off-base wells, on a prioritized basis.
 - DoD intends to prioritize and respond to locations where known levels in drinking water are the highest and will focus on installing enduring solutions such as drinking water treatment systems. DoD believes this is the best approach for the long-term protection of human health and the environment.
- AF is investigating PFOS/PFOA under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980
- Defense Environmental Restoration Program (DERP) eligible
 - New, Existing, or (re-opened) Closed site must be validated before funds can be applied toward investigations or response actions

•AFFF – Aqueous Film-forming Foam

•PFOS - Perfluorooctane Sulfonate

•PFOA - Perfluorooctanoic Acid

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Evolving Drinking Water Regulations



- **May 2016 - USEPA lifetime health advisory (HA) guidance levels**
 - **PFOS/PFOA - 70 parts per trillion (ppt), Individually or combined**
 - **Non-enforceable/non-regulatory**
 - **DoD trigger level for action in drinking water**
 - **EPA rescinded HA of 70 ppt in June 2022**

- **NJDEP promulgated Maximum Contaminant Level (MCL) under SDWA**
 - **04 Sep 2018: PFNA 13 ppt**
 - **01 June 2020: PFOS 13 ppt, PFOA 14 ppt**
 - **Air Force investigates PFOS/PFOA under CERCLA (aka Federal Superfund Cleanup)**
 - **OSD (12 Jan 2021) – NJDEP MCLs are potential ARARs (evaluated after determination of unacceptable risk)**
 - **OSD Memo (22 Dec 2021) – Guidance on Using State PFAS Drinking Water Standards in CERCLA Removal Action - *Response Action could be implemented for drinking water well exceedance of NJDEP MCLs, if:***
 - *source of PFAS is from AF;*
 - *upgradient drinking water well exceeds 2016 HA;*
 - *wells must be hydraulically connected;*
 - *must exceed 2016 HA in the future*
 - **JBMDL Drinking Water Systems meet these standards**

•ARARs – Applicable or Relevant and Appropriate Requirements
•CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

•DoD – Department of Defense
•NJDEP – New Jersey Department of Environmental Protection
•OSD – Office of Secretary of Defense
•SDWA – Safe Drinking Water Act

•PFAS – Per- and polyfluoroalkyl substances
•PFOS - Perfluorooctane Sulfonate
•PFOA - Perfluorooctanoic Acid

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PFOS/PFOA Mitigations



Temporary Ion Exchange Treatment System



Water Main Construction & Connections

■ On-base

- Air Force sampled all on-base public drinking water systems (PWS) – 2016
- All of JB MDL’s primary operating drinking water sources are non-detect for PFOS/PFOA/PFNA
- All Lakehurst drinking water non-detect for PFOS/PFOA/PFNA except:
 - 2 back-up supply wells exceeded 70 ppt for PFOS/PFOA in 2016 and were taken offline Apr 2019
 - mitigated Apr 2019 using ion exchange as temporary short-term solution
- New Back-up Water System
 - Construction of new, deep, confined water supply well – 100% complete
 - Treatment building for new water supply well - 100% complete
 - Permit to Operate effective 01 Apr 2023
 - Decommission the 2 back-up supply wells impacted by PFAS – 100% complete



Drilling Potable Well



New Back-up PWS

■ Off-base Impacted Properties

- Immediate: provided bottled water > 70 ppt for PFOS/PFOA
- Short-term solution: POET or POUT filtration systems
- Long-term, permanent solution: connected to municipal water – Sept 2022
- Manchester Municipal Supply Well #4 Mitigation – June 2023
 - PFOS exceeded maximum contaminant level of 13 ppt



•PFAS – Per- and polyfluoroalkyl substances
 •PFOS - Perfluorooctane Sulfonate

•PFOA - Perfluorooctanoic Acid
 •PFNA - Perfluorononanoic acid

•ppt – part per trillion

•POET – point of entry treatment
 •POUT – point of use treatment

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USEPA MCLs



- **10 April 2024 - USEPA issued a final rule on National Primary Drinking Water Rule**
 - Establishes Maximum Contaminant Levels (MCLs) for five PFAS and Hazard Index level for two or more of four PFAS as a mixture
 - Applicable to Public Water Systems (PWS), including DoD
 - Not Applicable to private drinking water wells
 - Rule become effective 25 June 2024, unless challenged in court
 - PWS have five years to comply with the levels

Compound	Final MCL-Goal (MCLG)	Final MCL (enforceable levels)
PFOA	Zero	4.0 parts per trillion (ppt) (also expressed as ng/L)
PFOS	Zero	4.0 ppt
PFHxS	10 ppt	10 ppt
PFNA	10 ppt	10 ppt
HFPO-DA (commonly known as GenX Chemicals)	10 ppt	10 ppt
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index	1 (unitless) Hazard Index

•PFAS – Per- and polyfluoroalkyl substances

•PFOS - Perfluorooctane Sulfonate

•PFOA - Perfluorooctanoic Acid

•PFBS - Perfluorobutane sulfonic acid

•PFHxS - Perfluorohexane sulfonate

•PFNA - Perfluorononanoic acid

•GenX - hexafluoropropylene oxide (HFPO) dimer acid

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Off-base PFAS Drinking Water Mitigation Response to EPA MCLs



- **Mitigation – Private Drinking Water Wells ¹**
 - Point of Use Treatment (POUT) > 3X MCLs existing properties (est. FY2026)
 - Resample all former properties (est. FY2027)
 - Bottled water > DoD trigger levels
 - Point of Entry Treatment (POET) or connect to Municipal water (i.e. Hot-taps) > MCL
 - ◆ Step-out sampling (est. FY2028)
- **Mitigation – Manchester Township Well #4**
 - Continue temporary well-head mitigation (ongoing)
 - Complete Non-time Critical Removal Action Memo for permanent solution (ongoing)
 - Design/Construct Well Head Treatment as permanent solution (planned)

1 - Prioritization of Department of Defense (DoD) Cleanup Actions to Implement the Federal Drinking Water Standards for Per- and Polyfluoroalkyl Substances Under the Defense Environmental Restoration Program; Assistant Secretary of Defense, 7 Feb 2025



Off-base PFAS Drinking Water Investigations Current Activities & Next Steps



- **Drinking Water Investigations**
 - Initial focus areas McGuire, Dix, and Lakehurst (2016-2022)
 - Dix Primary Focus Area (2024-2025)
 - Lakehurst Primary & Secondary Focus Areas (2024-2025)
 - McGuire & Dix Secondary Focus Areas initial sampling (est. FY2026)
- **Community Engagements for PFAS in Drinking Water**
 - PFOS/PFOA Open House, Jackson Township, Christa McAuliffe Middle School (28 Feb 2017)
 - PFAS Open House, Browns Mills, Station #3 Fire House (05 June 2024)
 - PFAS Open House, location TBD (est. fall 2026)
 - Routine updates at RAB Meetings (2016-present)



Off-base PFAS Investigation

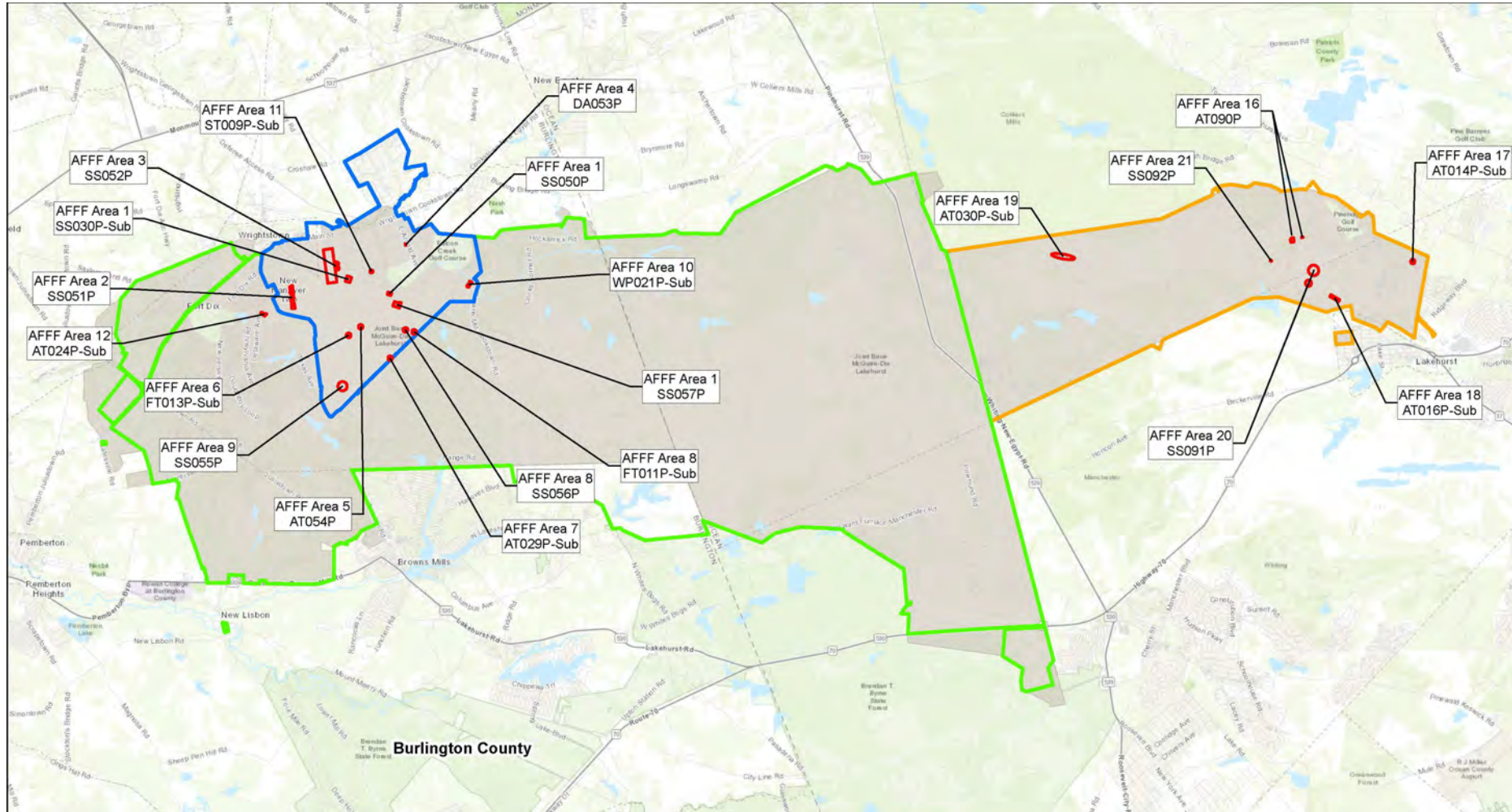


- **Investigations**

- **Preliminary Assessment (2015) - identified 34 potential AFFF release areas**
- **Site Inspection (2015-2018) – confirmed releases at 34 AFFF release areas**
- **Rapid Response (2016-2021) – initial investigation of off-base drinking water**
- **Expanded Site Inspection (2019-2023) – routine monitoring of off-base drinking water, response actions for Lakehurst potable well and off-base water line connections, evaluate limited off-base groundwater and surface water for future investigations**
- **Remedial Investigation Phase 1 (2020-2025) – nature and extent characterization on- & off-base**
- **Off-base PFAS Drinking Water Response (2022-2027) – investigated drinking water in expanded focus areas, evaluate surface water for future expansion of focus areas**
- **Remedial Investigation Phase 1a – Data Gap investigation (est. FY2026-FY2030)**
- **Background Study (FY2026/FY2027 - RPMO) – evaluate anthropogenic PFAS concentrations**
- **Non-AFFF Source Area Due Diligence (2022-2023; est. FY2026/FY2027) – evaluate non-AFFF releases**



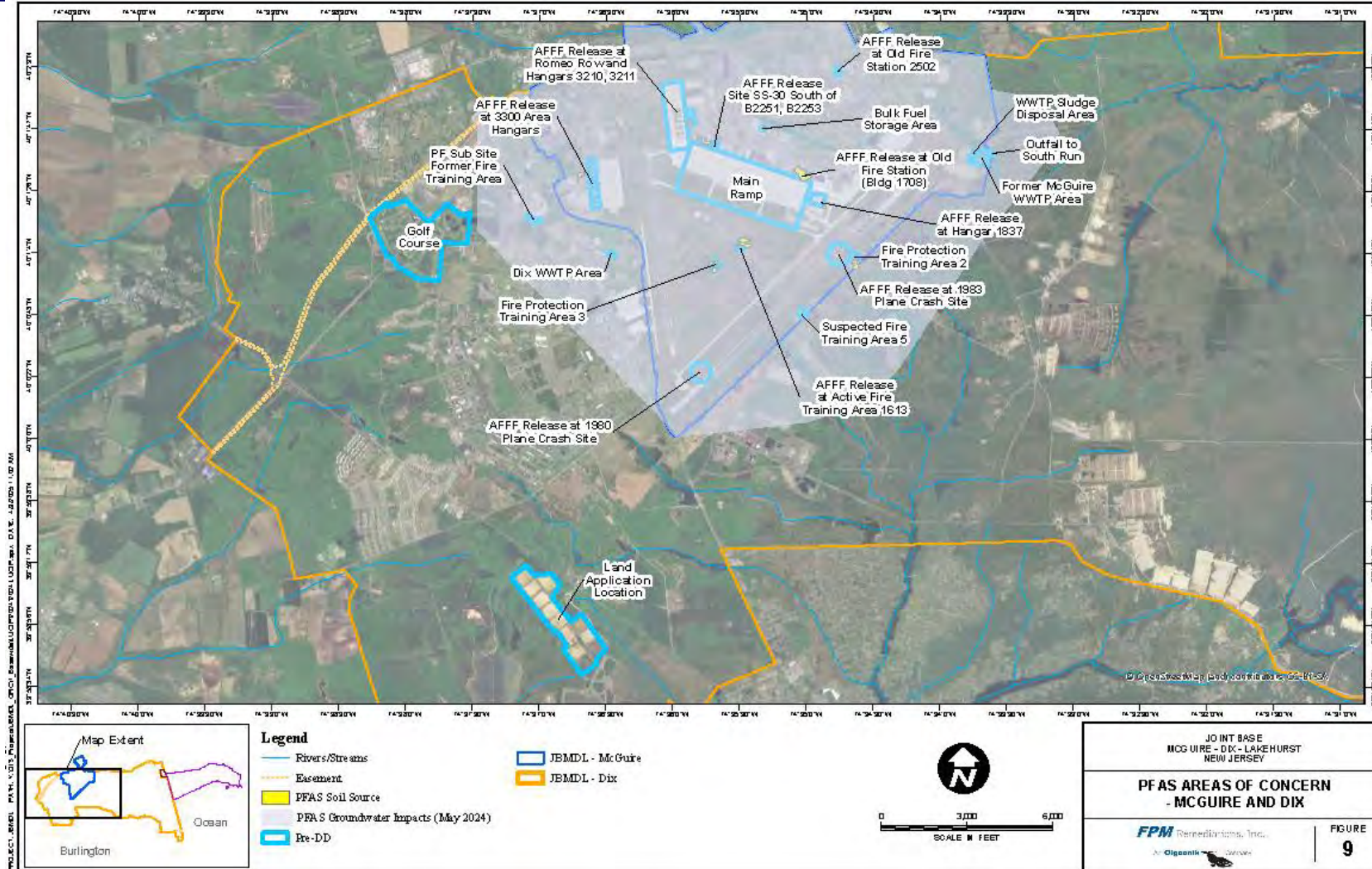
JBMDL PFAS Sites



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McGuire/Dix PFAS Groundwater Impacts

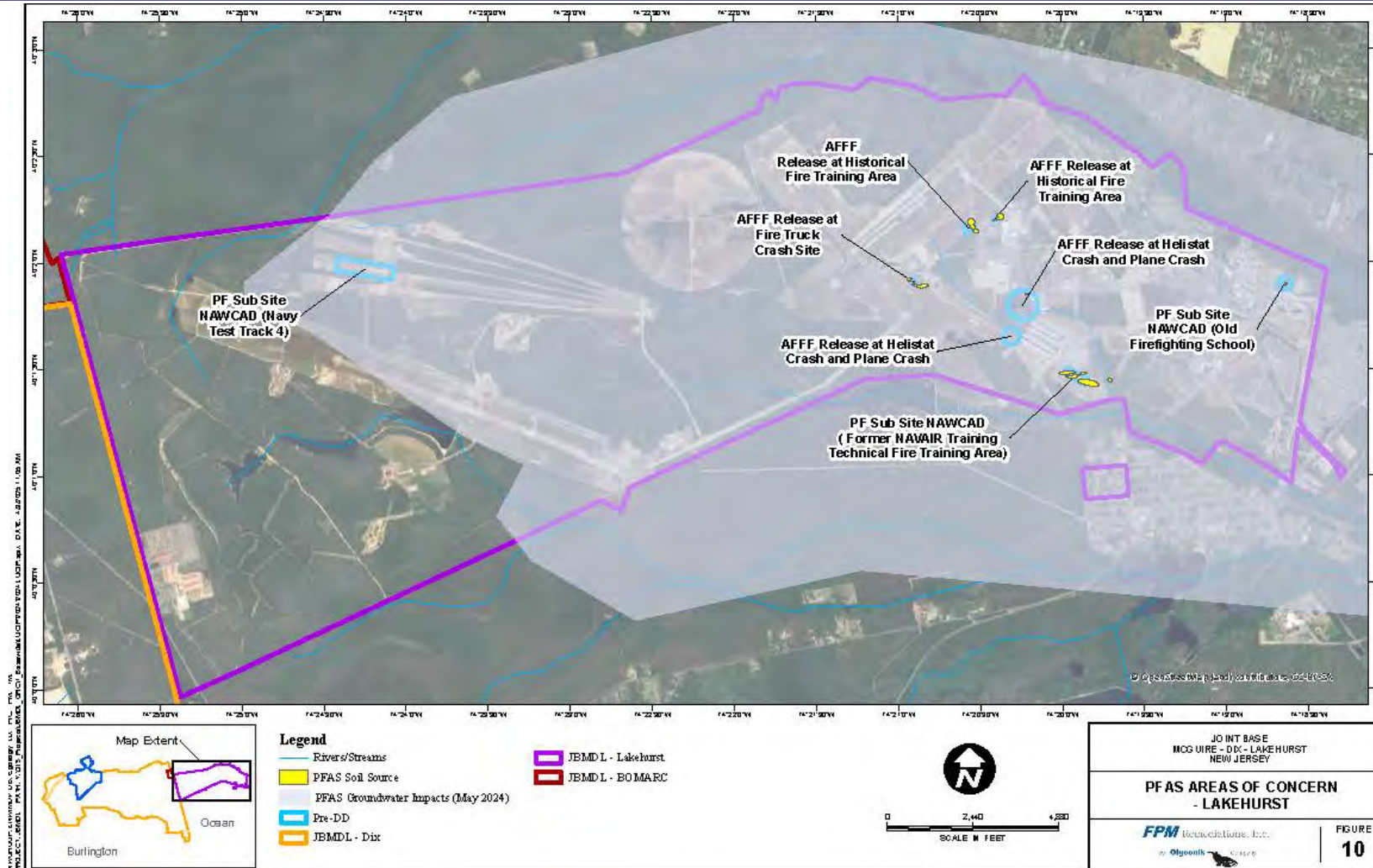


•PFAS – Per- and polyfluoroalkyl substances

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Lakehurst PFAS Groundwater Impacts



•PFAS – Per- and polyfluoroalkyl substances

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Optimized Remediation Contract (ORC) Update

Mr. Niels van Hoesel
Project Manager, FPM Remediations Inc.

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ORC Introduction



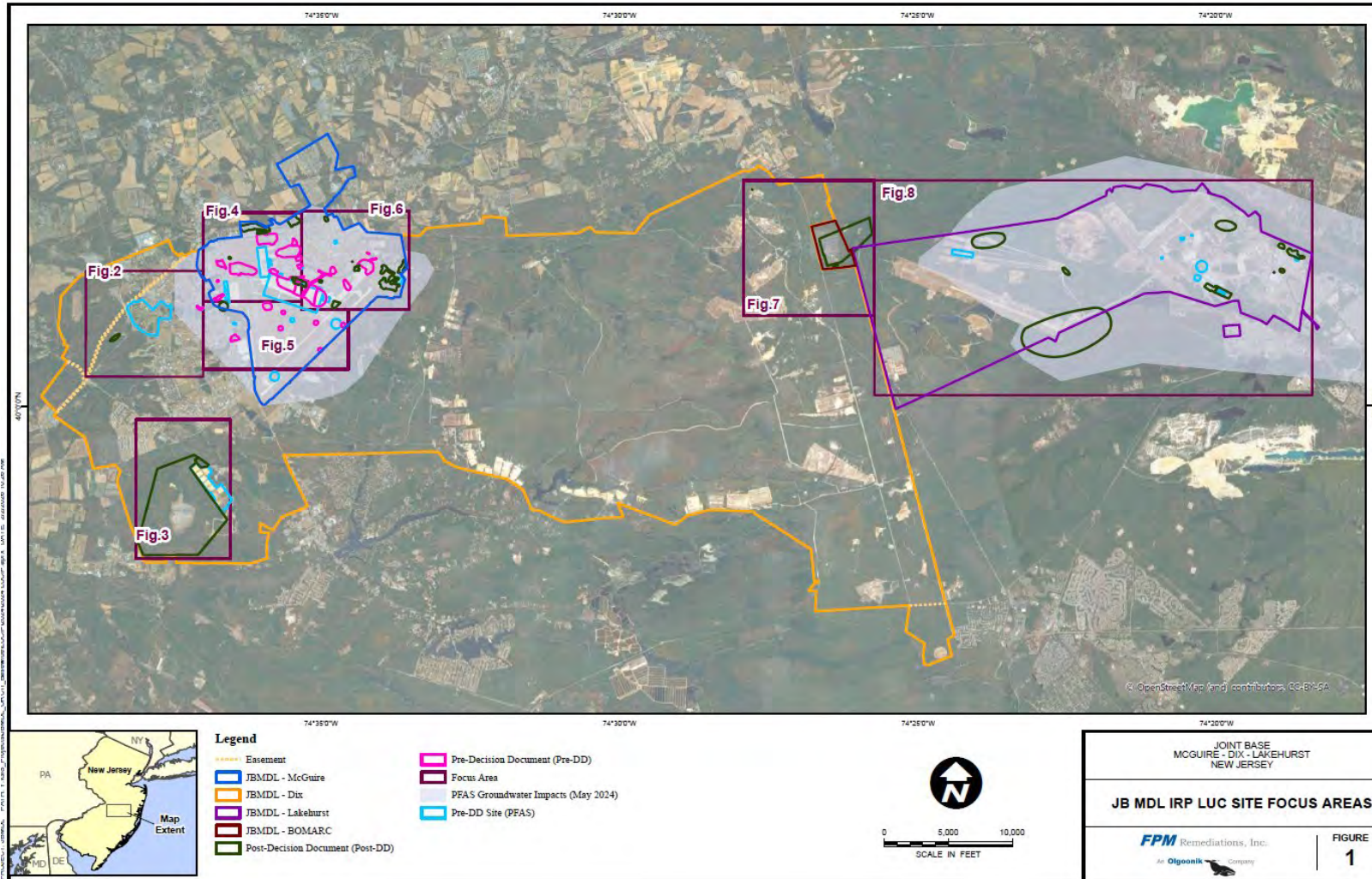
■ Optimized Remediation Contract (ORC)

- Awarded September 2024
- 10-year Firm Fixed Price (FFP) contract.
 - ◆ Year 1 completed. Year 2 ongoing
- 75 sites
 - ◆ McGuire: 51 Sites (FPM/Arcadis)
 - ◆ Dix: 11 Sites (Arcadis)
 - ◆ Lakehurst: 13 Sites (EA/FPM)

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JB MDL Oversight Figure



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ORC Introduction

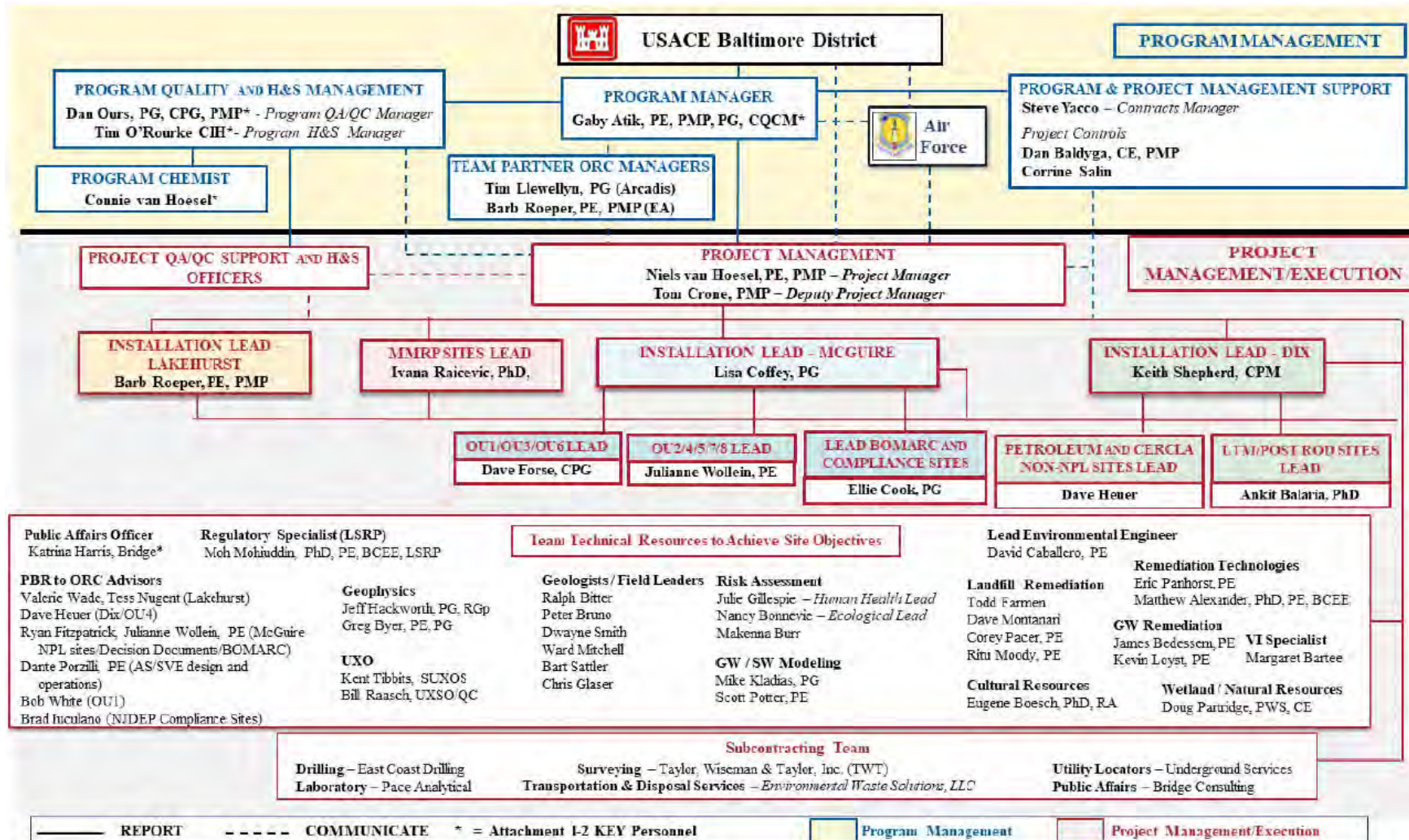


-
- **Prime Contractor: FPM Remediations Inc.**
 - **Teaming Partners:**
 - **Arcadis**
 - **EA Engineering**

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Organizational Chart



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Organizational Chart



FPM Program Manager



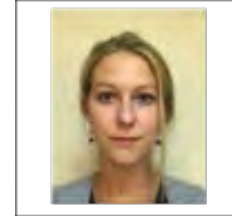
Gaby Atik

FPM Project Manager



Niels van Hoesel

FPM Assistant PM



Ellie Cook

Arcadis PM



Tom Crone

Arcadis Assistant PM



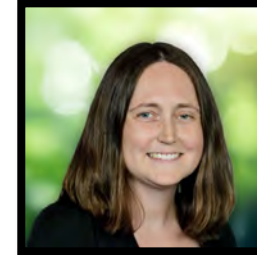
Corrine Salin

EA PM



Barb Roeper

EA Assistant PM



Samantha Saalfield

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Project Management/Meetings



- **Project Kickoff Meeting with USACE/AFCEC – 16 OCT 2024**
- **Monthly Status Reports**
- **Monthly Coordination Calls with USEPA/NJDEP**
- **Monthly Coordination Calls with NJDEP (Compliance Sites)**
- **Quarterly Project Manager Meetings (PMM) with USACE, AFCEC, USEPA and NJDEP**
- **General Meetings with USACE and AFCEC – held as needed**
- **Biweekly Conference Calls with AFCEC/USACE**
- **Quarterly RAB meetings in person**



McGuire (51 Sites)



■ Installation Restoration Program (IRP) Sites

- OU1 (3)
- OU2 (10)
- OU3 (4)
- OU4 (1)
- OU5 (3)
- OU6 (5)
- OU7 (4)
- OU8 (6)
- BOMARC (2)

■ NJDEP Compliance Sites (7)

■ MMRP Sites (6)



Dix and Lakehurst



■ Dix (11)

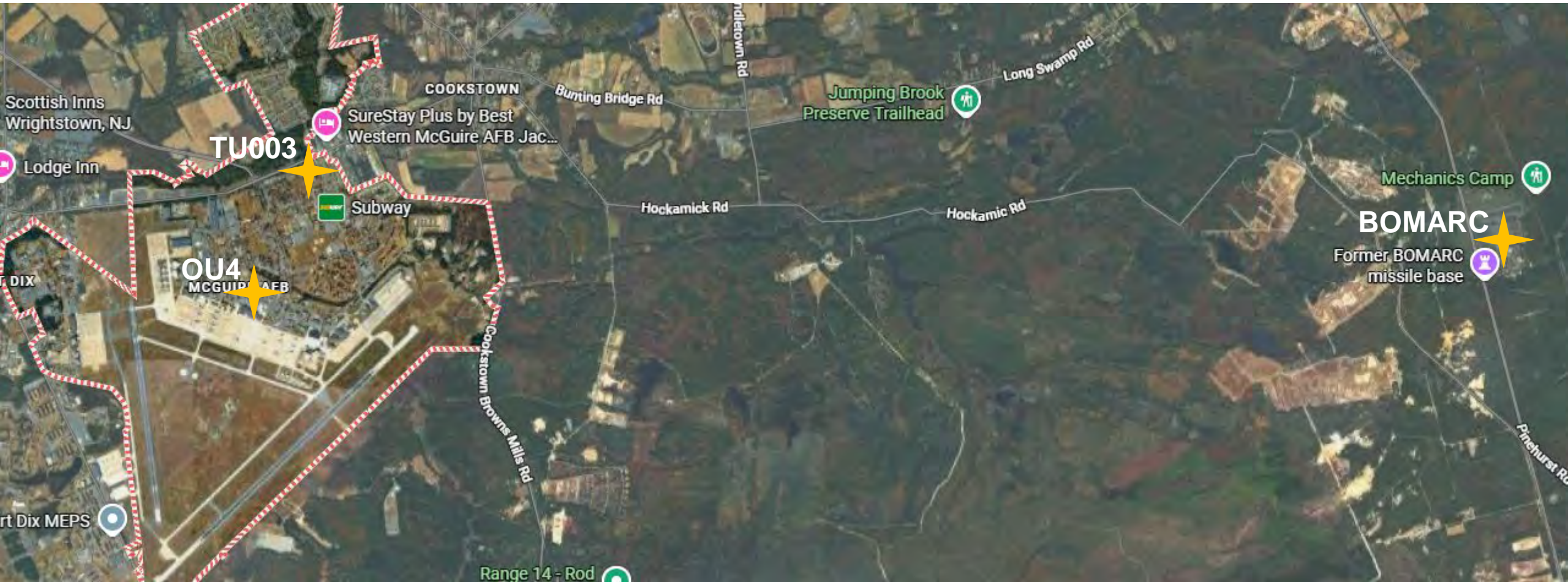
- IRP Sites (8)
- NJDEP Compliance Sites (2)
- MMRP Sites (1)

■ Lakehurst (13)

- IRP Sites (10)
- MMRP Sites (3)



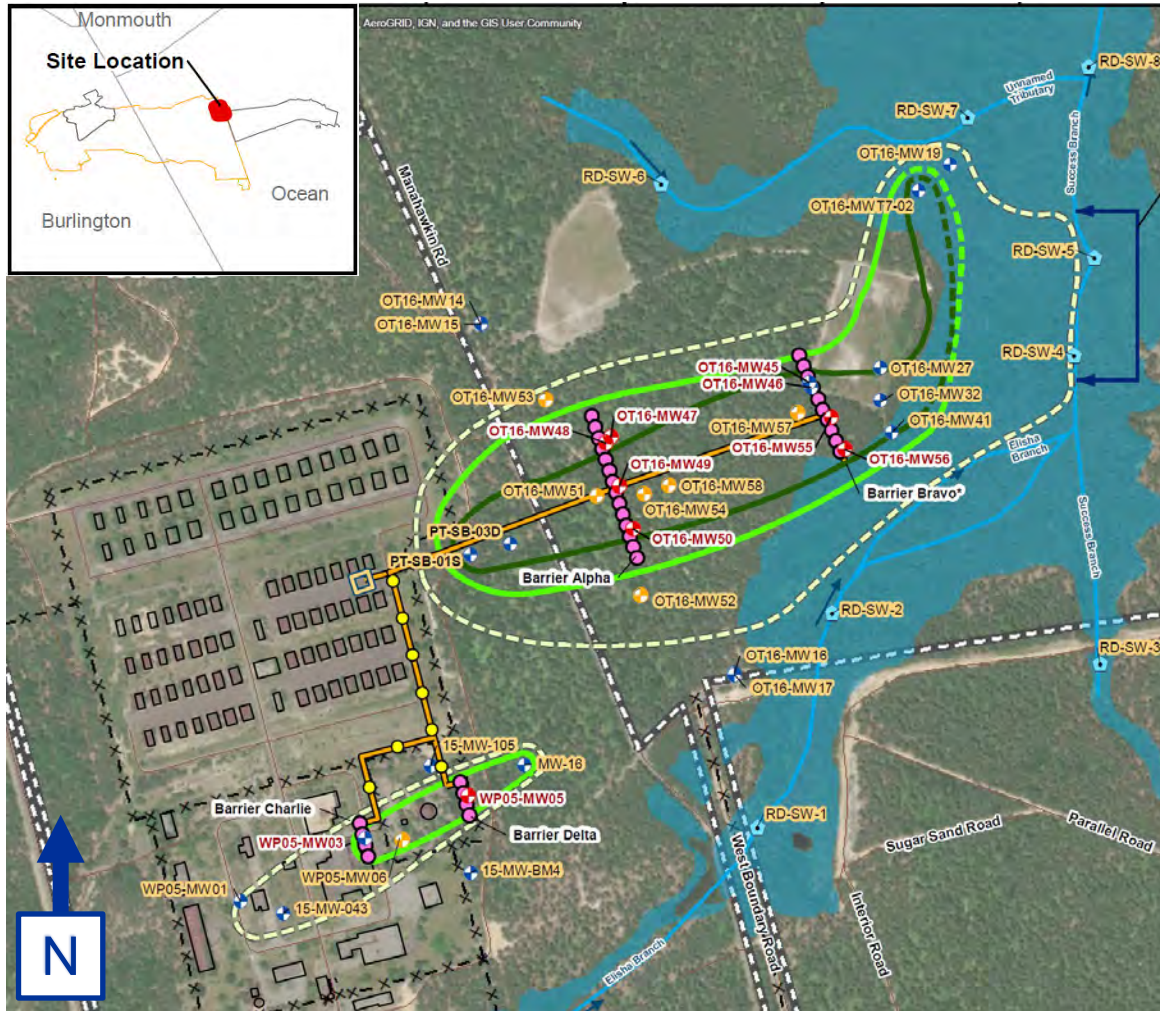
McGuire: BOMARC, TU003, and OU4



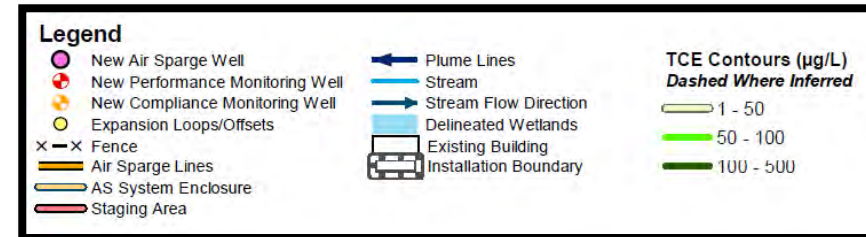
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BOMARC: Background



- BOMARC is part of JB MDL-McGuire and located off SR-539 near Colliers Mills Wildlife Management Area
- Two groundwater plumes (OT016 and WP005) are present and impacted by TCE, which was commonly used as a degreaser
- A Record of Decision selecting Air Sparging to treat contaminated groundwater was signed in 2019
- A single air sparge system that treats both plumes was installed and started in 2020
- The system is anticipated to run for up to 100 years at OT016; however, most of the plume will be eliminated within 10-20 years



*Figure presents groundwater plumes at the time of the Remedial Design (2020)



BOMARC: Remediation System



1. Utilizing the air sparge system, the plume will be cut-off with the 'Alpha Barrier' to stop downgradient migration until TCE stops desorbing from the clay layer (estimated 100 yrs)

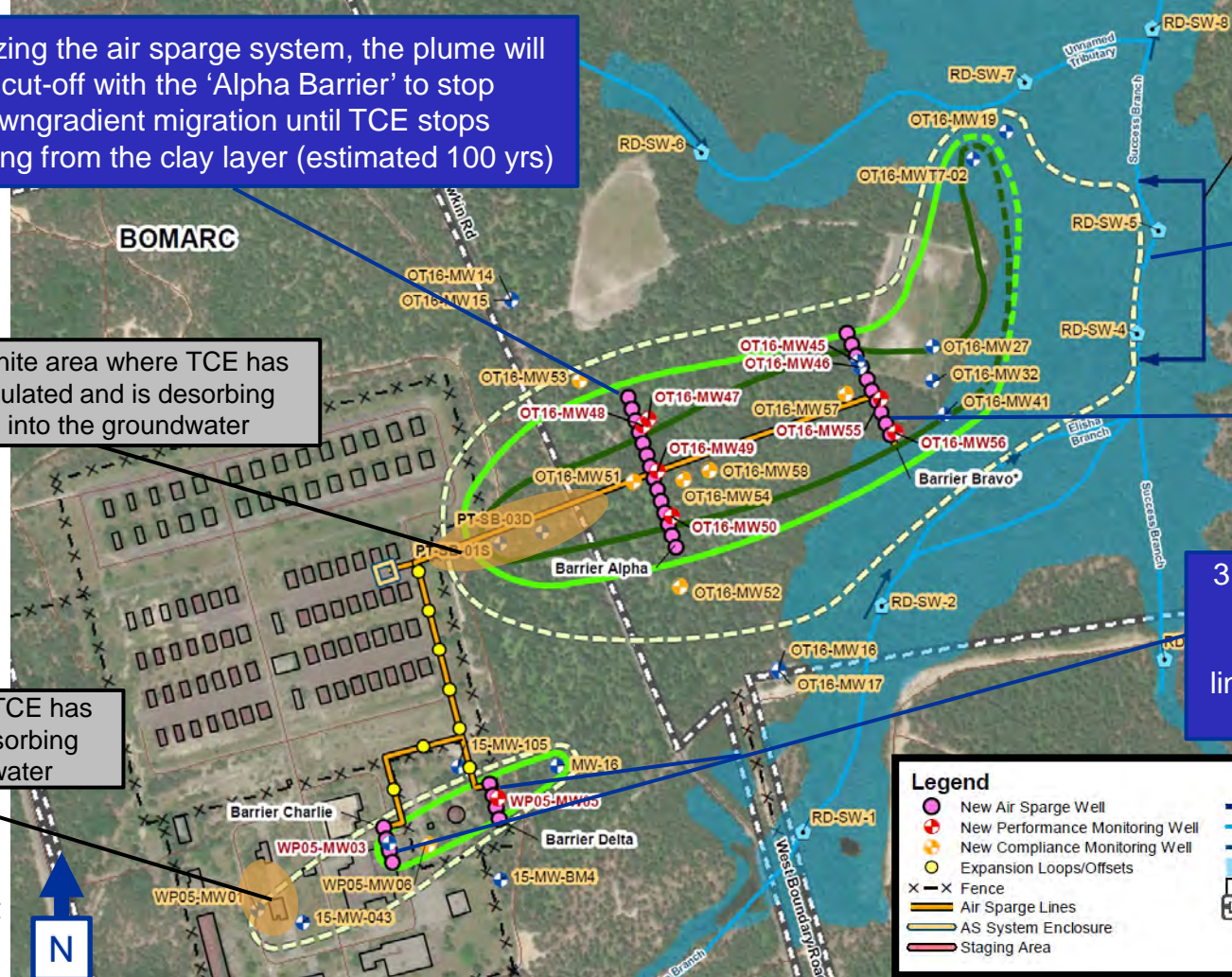
4. Continue monitoring groundwater and surface water to confirm treatment is occurring and the plumes are shrinking

2. The 'Bravo Barrier' cuts the remaining plume in half to reduce the timeframe for cleanup in the downgradient plume. This will also reduce the timeframe to cleanup surface water (estimated 10-12 yrs)

3. WP005 plume has lower concentrations than OT016 and attenuates before reaching surface water. Two air sparge lines were installed to remediate the plume faster

Clay/lignite area where TCE has accumulated and is desorbing TCE into the groundwater

Clay/lignite area where TCE has accumulated and is desorbing TCE into the groundwater



*Figure presents groundwater plumes at the time of the Remedial Design (2020)

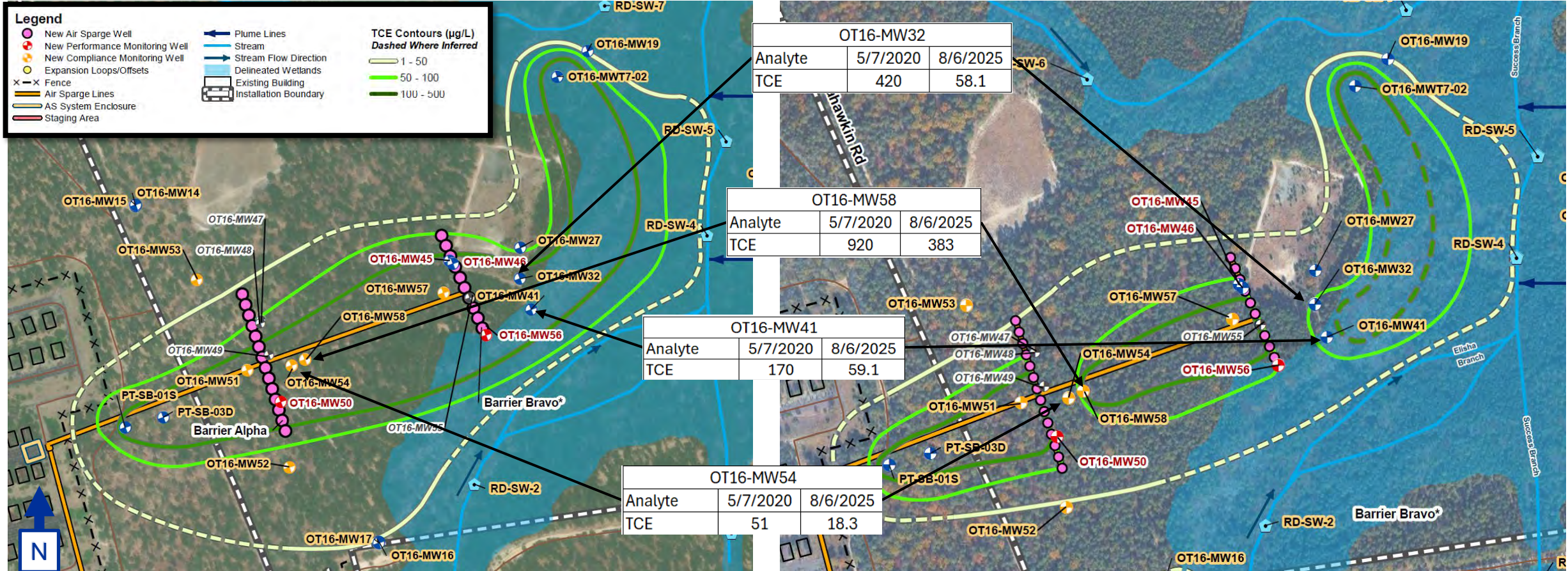


BOMARC: OT016 Progress



OT016 Groundwater Plume in 2020

OT016 Groundwater Plume in 2025



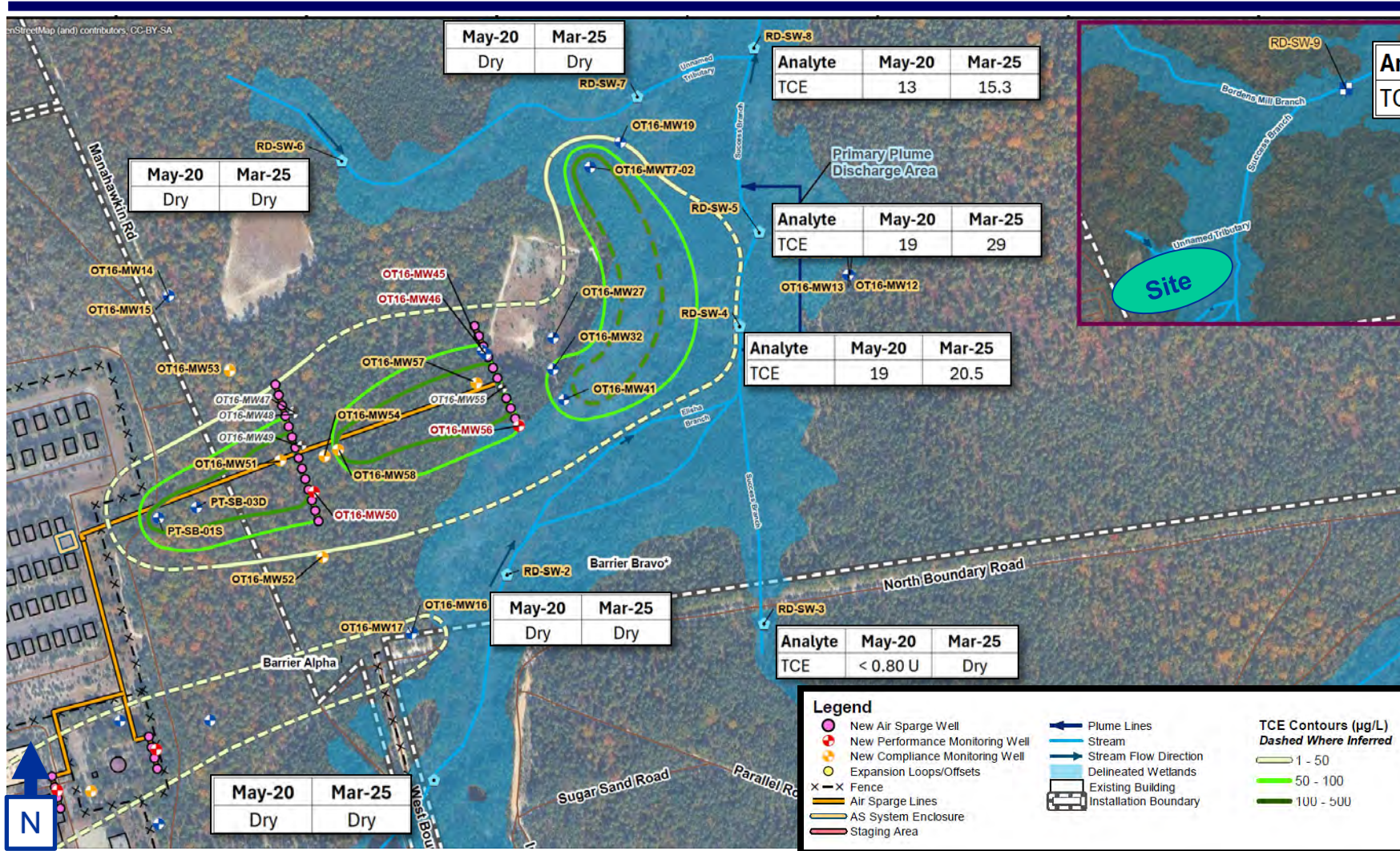
*Only databoxes for the baseline round of sampling and 2025 are shown. Cis-1,2-DCE and vinyl chloride are not shown. Additionally, data at only 4 wells is presented here.

DCE - Dichloroethylene
 TCE - Trichloroethylene

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BOMARC: Surface Water Progress



Analyte	May-20	Mar-25
TCE	0.93 J	0.266

- Only databoxes for the baseline round of sampling and 2025 are shown.

- Cis-1,2-DCE is below remedial goals and/or non-detect and vinyl chloride is non-detect, and therefore neither COC is presented here

- Surface water samples at the sentinel location (RD-SW-9) remain below remedial goals

- Concentrations in surface water are anticipated to stay elevated until clean groundwater reaches Success Branch (10-12 yrs)

COC – Contaminant of Concern
 DCE- Dichloroethylene
 TCE - Trichloroethylene

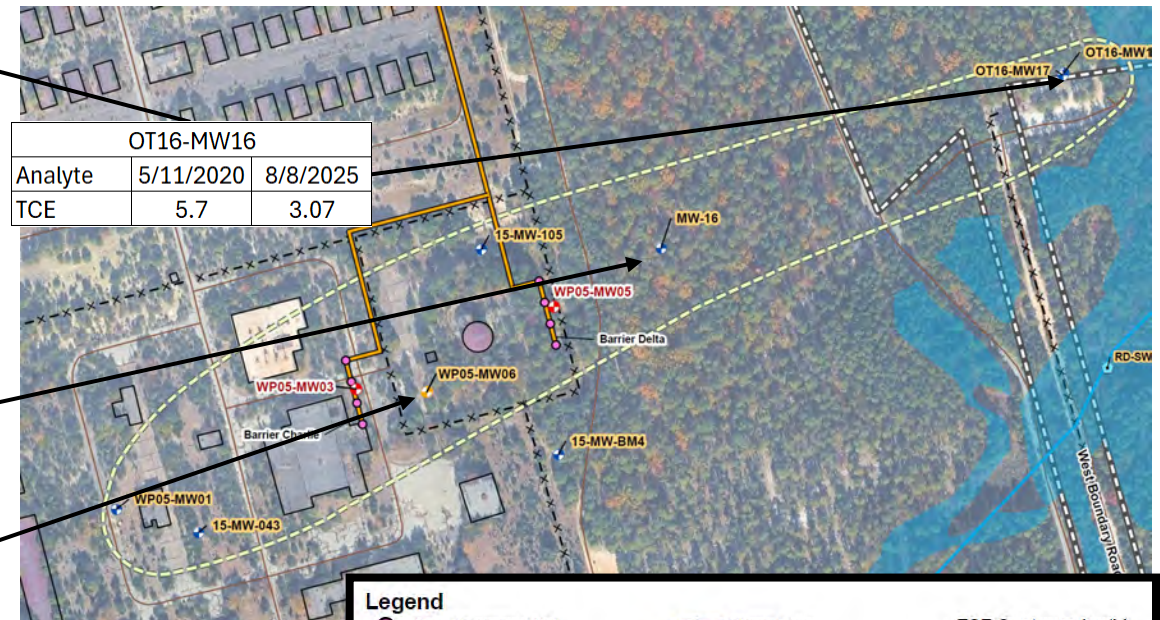
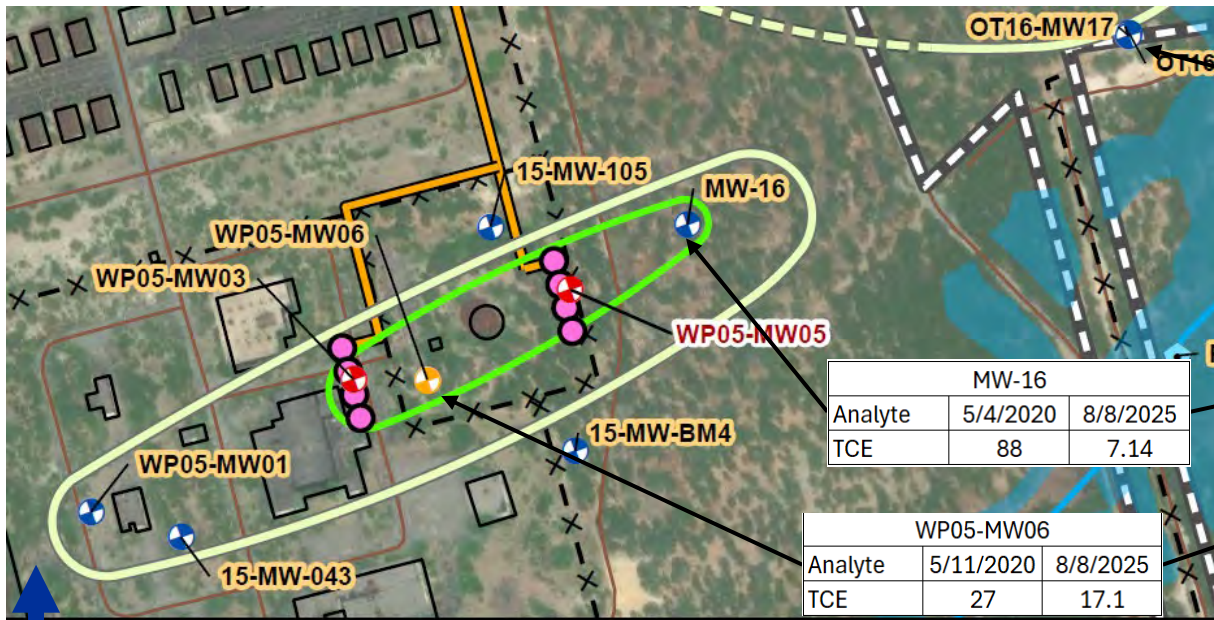
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BOMARC: WP005 Progress

WP005 Groundwater Plume in 2020

WP005 Groundwater Plume in 2025



Legend

- New Air Sparge Well
- New Performance Monitoring Well
- New Compliance Monitoring Well
- Expansion Loops/Offsets
- Fence
- Air Sparge Lines
- AS System Enclosure
- Staging Area
- Plume Lines
- Stream
- Stream Flow Direction
- Delineated Wetlands
- Existing Building
- Installation Boundary
- TCE Contours (µg/L)
Dashed Where Inferred
- 1 - 50
- 50 - 100
- 100 - 500

*Only databoxes for the baseline round of sampling and 2025 are shown. Cis-1,2-DCE and vinyl chloride are not shown. Additionally, data at only 3 wells is presented here.

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DCE - Dichloroethylene
TCE - Trichloroethylene



BOMARC: Path Forward



- **Continue to operate the AS system and perform routine maintenance for both OT016 and WP005**
- **Perform annual compliance monitoring of groundwater and surface water to document reductions in contaminant concentrations or identify changes. The next round of sampling for both groundwater and surface water will be conducted in April 2026.**
- **Modify the compliance monitoring network, as needed, and with concurrence from NJDEP**





TU003 – Thermal In-situ Sustainable Remediation (TISR™)

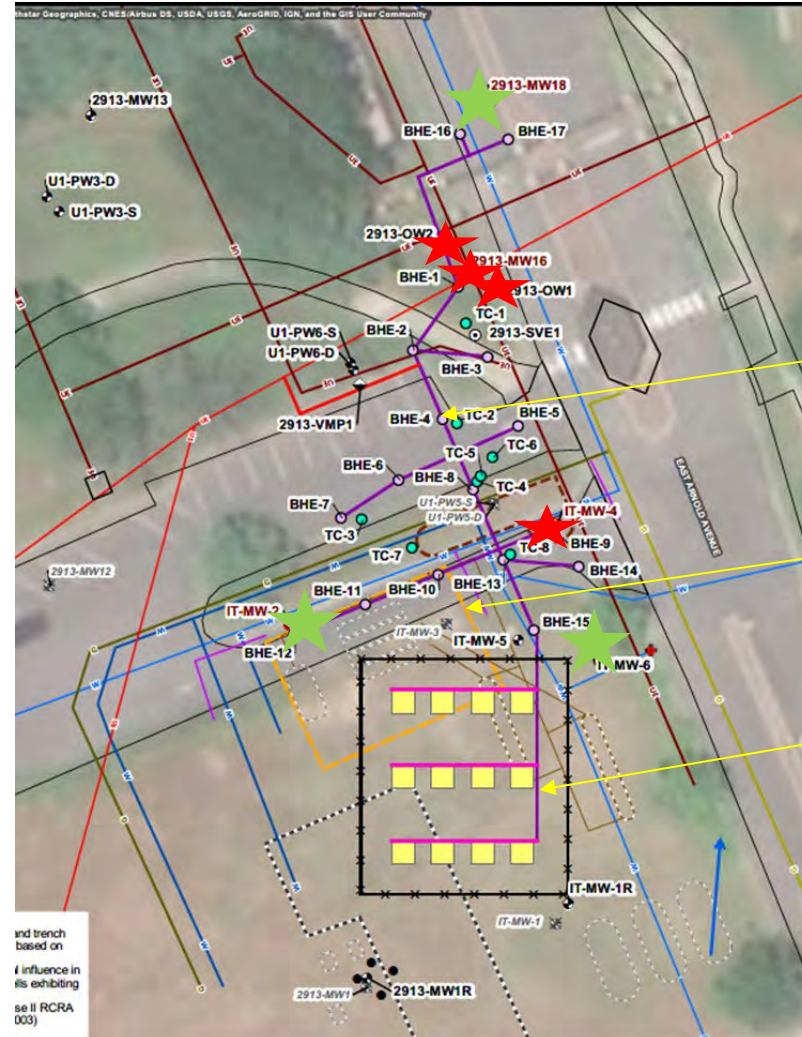


■ Site Status:

- Semi-annual GW performance monitoring and annual LUC inspections
- Continued operation of TISR system (started in 2020)
- 2017 source area excavation
- Soil – Compliance achieved (NFAE issued in 2025)

■ Remaining Impacts being addressed:

- 4 wells in treatment area with LNAPL (2913-MW16, IT-MW-4, OW-1, and OW-2). 
- 3 wells in treatment area with occasional LNAPL or COCs an order of magnitude or greater above PQLs (IT-MW-2, IT-MW-5, and 2913-MW18) 



TU003 – Former B2913 Exchange Gas Station - is the site of a former retail gas station with leaky USTs. All fueling infrastructure has been removed and site is vacant.

TISR footprint (“BHE” wells)

2017 excavation

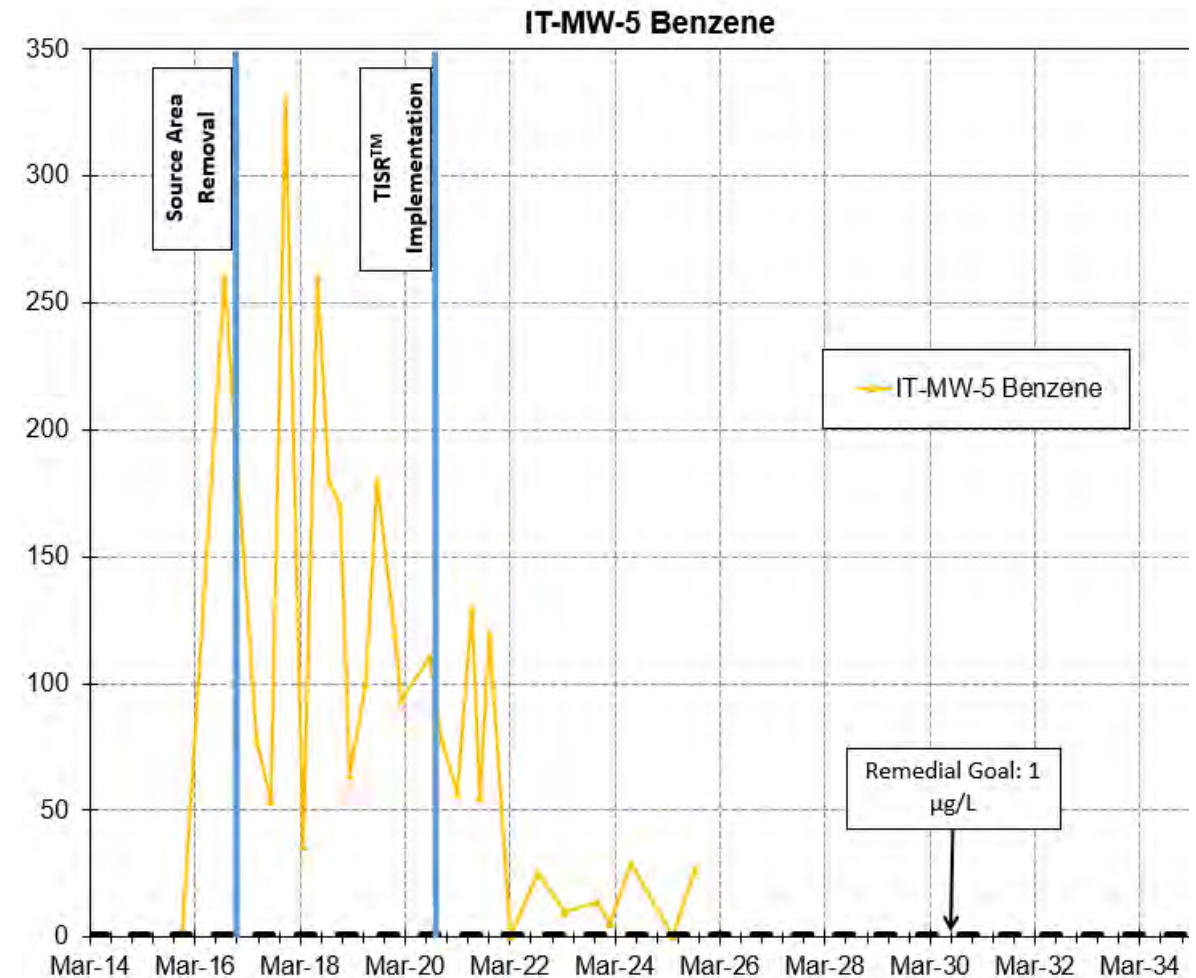
TISR solar panels



TU003: Remediation Progress



- General site conditions have significantly improved since remedy implementation in 2024
- Benzene in well IT-MW-5 illustrates improvement in groundwater quality in response to source area excavation and TISR treatment
- Remedy progress will continue to be monitored while taking opportunities for remedy optimization
- Site closure is projected for TU003 by 2032





TU003: Path Forward



- **Continue to operate the TISR system and perform routine maintenance**
- **Perform semi-annual compliance monitoring of groundwater to document reductions in contaminant concentrations or identify changes. The next round of sampling for groundwater will be conducted in March 2026.**
- **Continue annual reporting**
- **Modify the compliance monitoring network, as needed, and with concurrence from NJDEP**



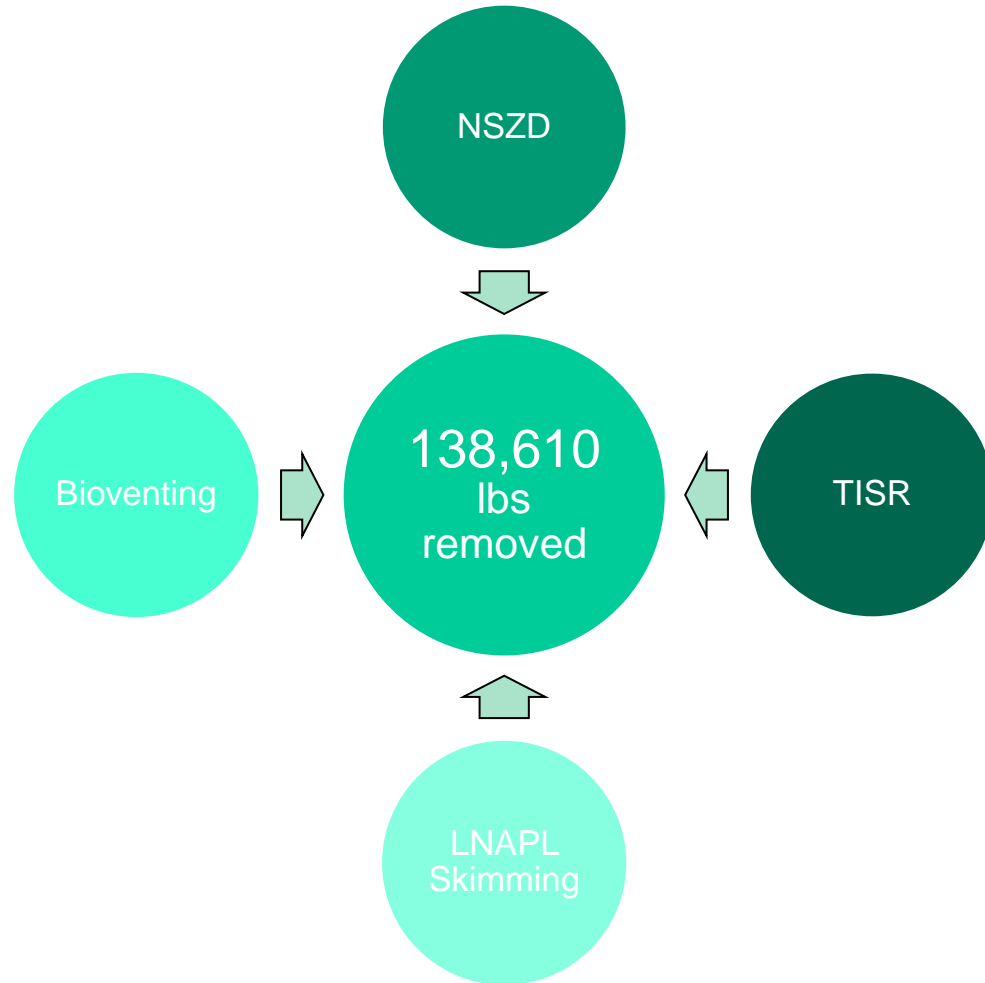
OU4



- **Baseline monitoring completed in June 2023.**
- **As part of the compliance sampling activities, groundwater samples were collected and analyzed for site-specific VOCs, SVOCs, and metals:**
 - **April, June, December 2024**
 - **March, August 2025**
- **Routine O&M activities completed for the enhanced recovery systems (2 mobile skimmers, biovent, and TISR) since start up in April/May 2024. Manual LNAPL recovery conducted in March, June, and December 2025 at wells within the remediation network where measurable LNAPL was present.**
- **USAF review of 2024 Annual Report in progress.**
- **IRACR documenting Remedy in Place (RIP) under USAF review; anticipated EPA and NJDEP submittal in June 2026. IRACR to present data from baseline through March 2025 for demonstration of RIP. These data are being shared in tonight's RAB.**

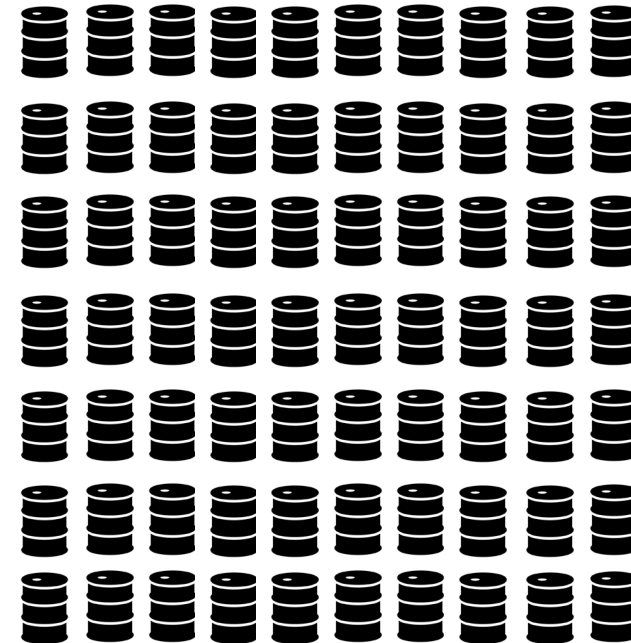


OU4 – 2024 Remediation Progress



■ 2024: 138,610 lbs removed

- Equal to 2,722 55-gal drums



X 38

■ 2025: data is being reviewed



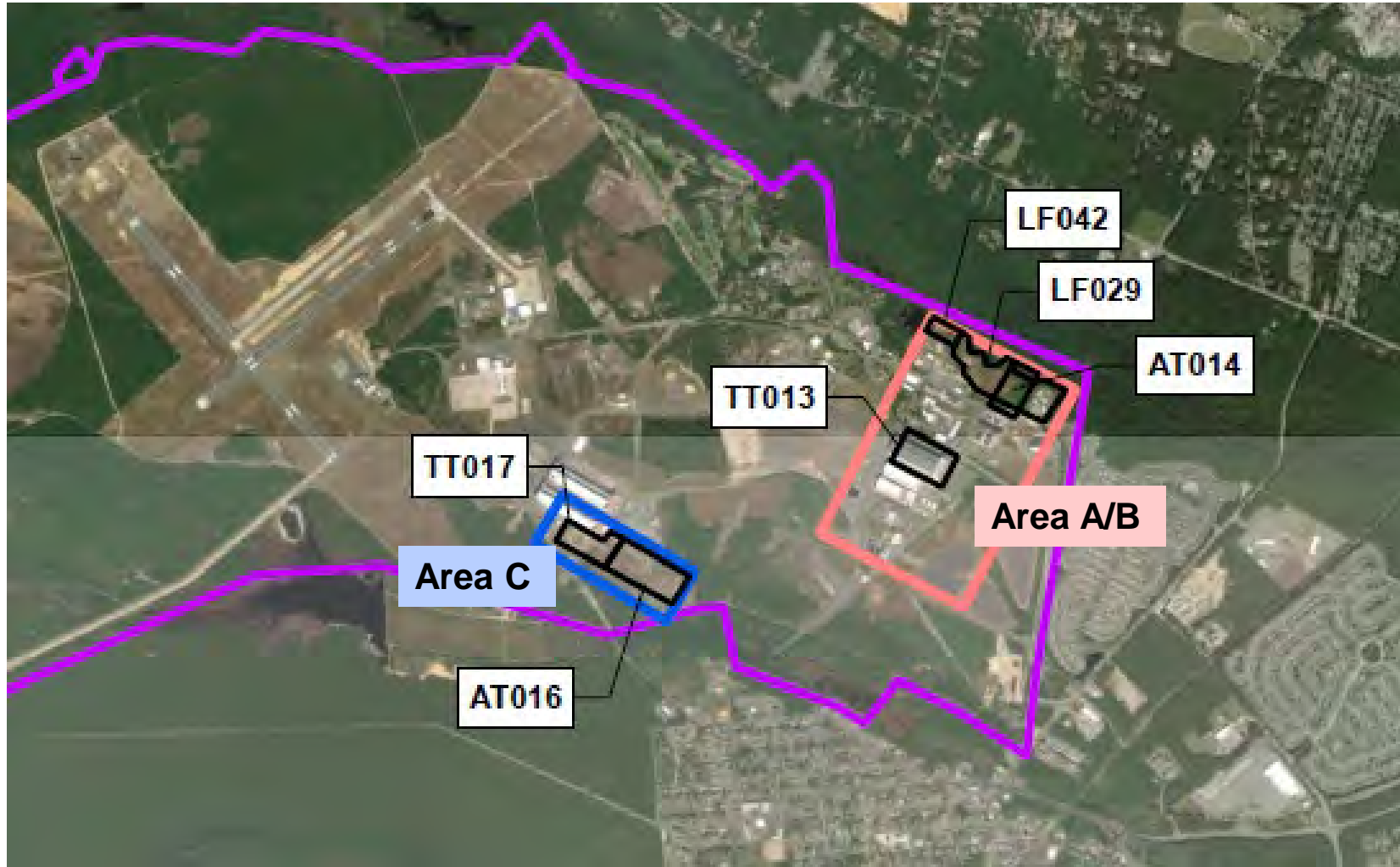
OU4: Path Forward



- **Continue to operate the bioventing, TISR, and LNAPL skimming systems and perform routine maintenance**
- **Perform semi-annual compliance/performance monitoring of groundwater to document reductions in contaminant concentrations or identify changes. The next round of sampling for groundwater will be conducted in March 2026. Perform annual surface water sampling in South Run.**
- **Achieve approval of the IRACR to demonstrate RIP. Submit annual progress reports. Optimize remedy in line with the approved RD/RAWP.**



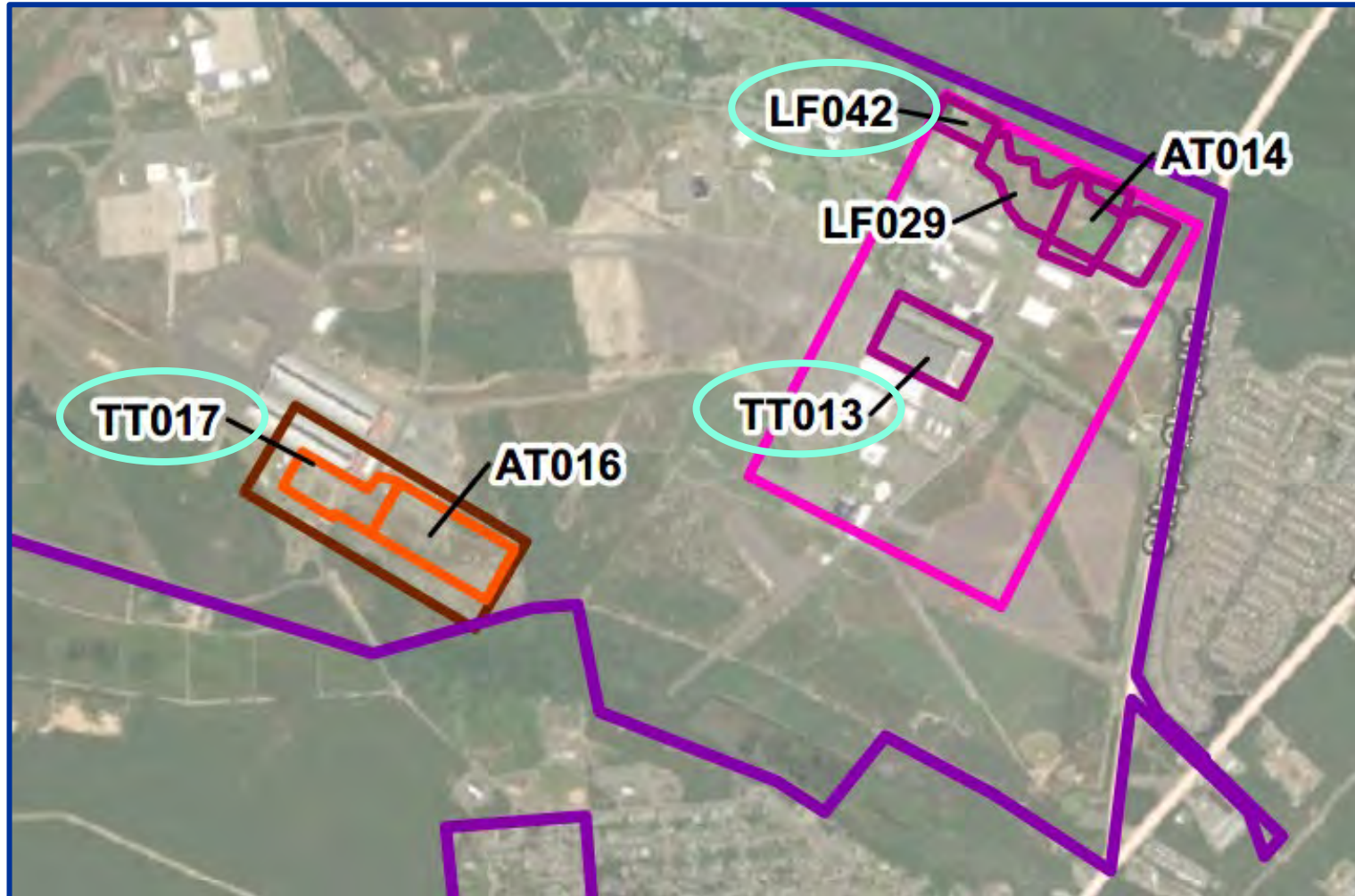
Lakehurst Areas A/B and C



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Lakehurst Areas A/B and C – Groundwater Cleanup Status



- Targeting site closeout.
- Groundwater pump and treat systems were decommissioned in 2024.
- Changes in remedy documented in *Explanations of Significant Differences* (in progress).
- At Sites TT013, TT017, and LF042, concentrations remain above remedial goals.

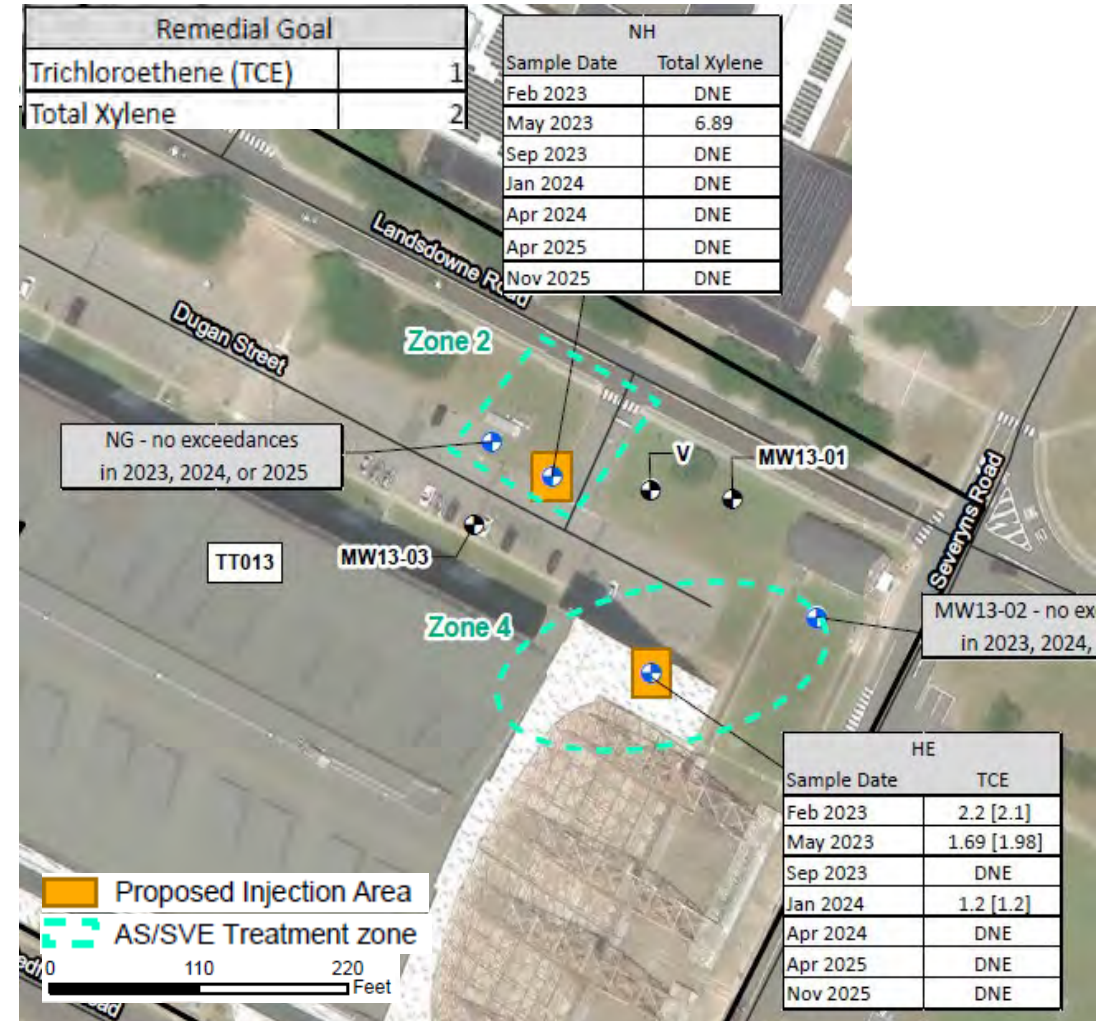
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Site TT013 Rebound Study/PAC Injections



- Limited areas of volatile organic compounds in groundwater.
- Air Sparge/Soil Vapor Extraction (AS/SVE) Systems currently off for rebound studies.
- Injections of powdered activated carbon (PAC) were successful in 2020-2021; additional targeted injections proposed for 2026.
- Four rounds of quarterly sampling are planned following injections to verify effectiveness.
- Based on previous results, it is expected that remedial goals will be achieved within 2 years after injections.



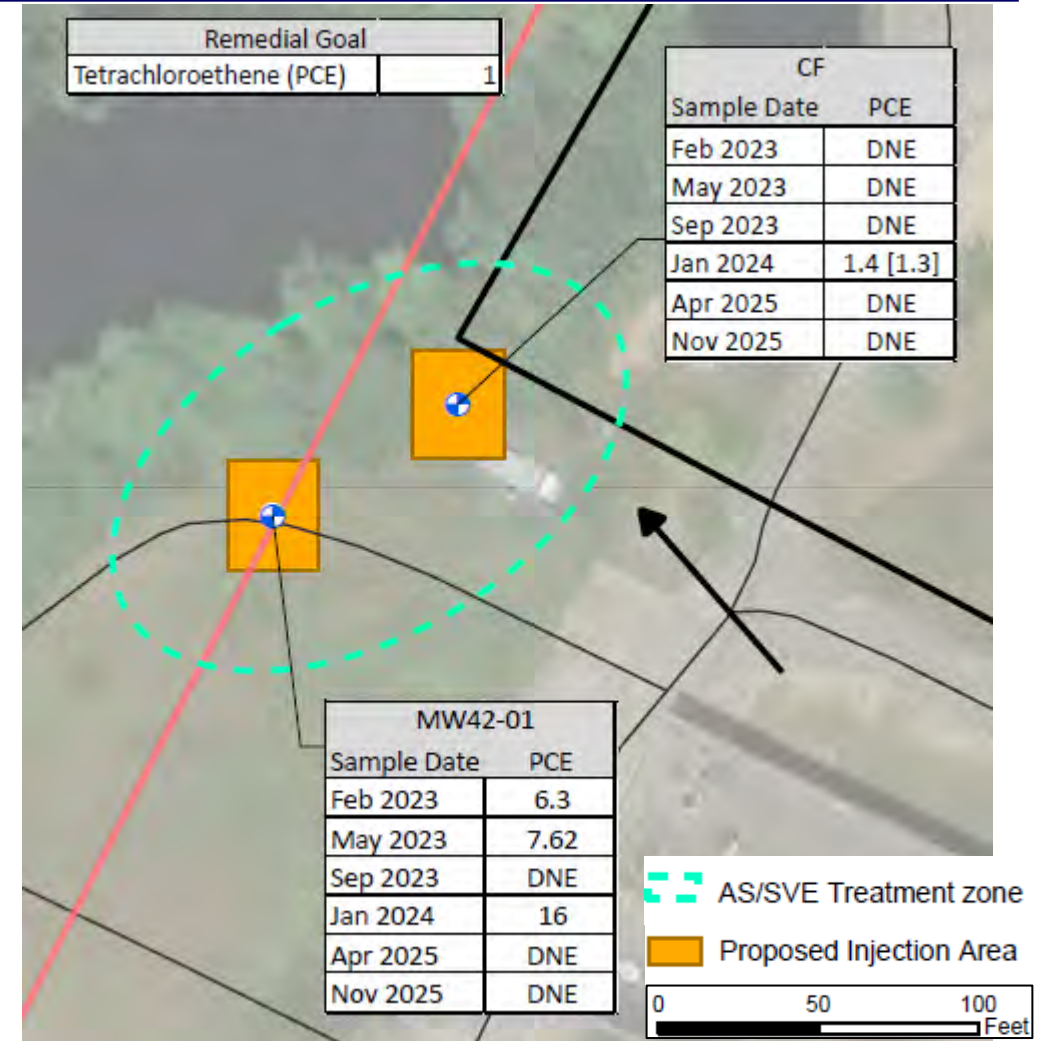
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Site LF042 Rebound Study/PAC Injections



- Limited areas of volatile organic compounds in groundwater.
- Air Sparge/Soil Vapor Extraction (AS/SVE) Systems currently off for rebound studies.
- Injections of PAC were successful in 2020-2021; additional targeted injections proposed for 2026.
- Four rounds of quarterly sampling are planned following injections to verify effectiveness.
- Based on previous results, it is expected that remedial goals will be achieved within 2 years after injections.



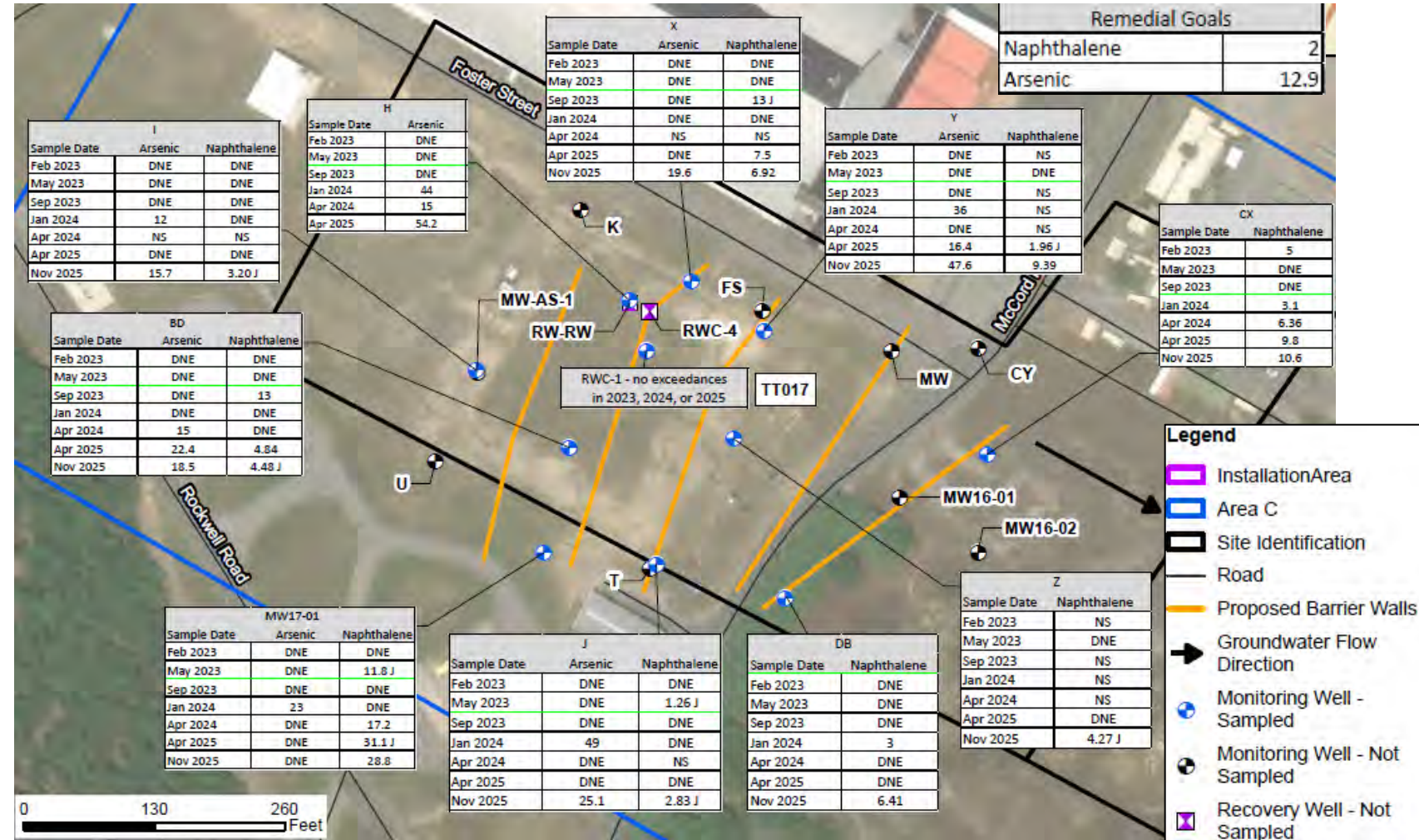
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Site TT017 Rebound Study/PAC Injections



- Naphthalene and arsenic exceed remedial goals.
- Air Sparge/Biosparge Systems currently off for rebound studies.
- PAC injections to form treatment barrier walls proposed for 2026.
- Four rounds of quarterly sampling to verify effectiveness.
- It is expected that remedial goals will be achieved within 2 years.



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QUESTIONS?

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