



# *Installation Restoration Program*



Air Force Civil Engineer Center

## **Air Force Civil Engineer Center (AFCEC) Emerging Contaminants Update**

Kimberly Gill, AFCEC

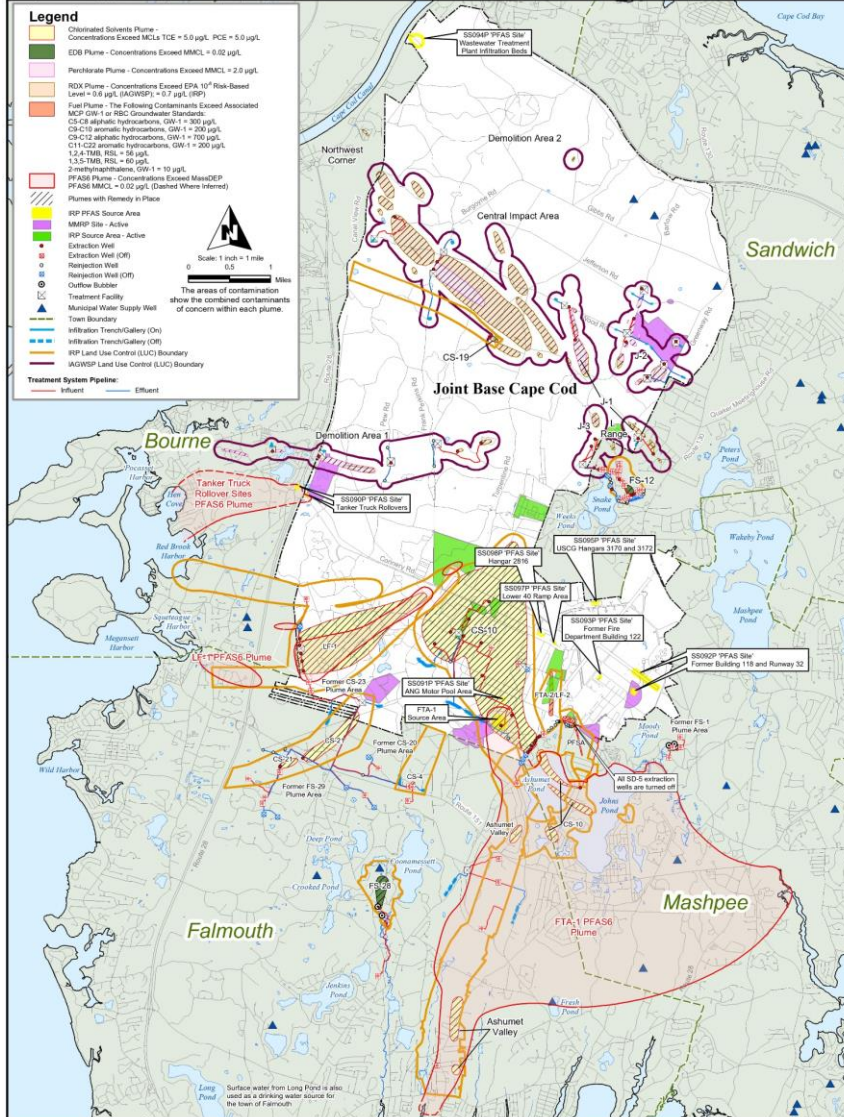
Mary O'Reilly, Jacobs

JBCC Cleanup Team Meeting

10 April 2024

## **Overview:**

- Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-Dioxane Standards
- Response Actions
- Fire Training Area-1 (FTA-1) – Supplemental Remedial Investigation/Supplemental Feasibility Study (RI/FS) for 1,4-Dioxane and PFAS
- Tanker Truck Rollover Sites (TTRS) – RI/FS for PFAS
- Landfill-1 (LF-1) – Supplemental FS for 1,4-Dioxane and PFAS and Decision Document
- Flight Line Area Operable Unit (OU) – RI for PFAS



**Legend**

- Chlorinated Solvents Plume - Concentrations Exceed MCL: TCE = 5.0 µg/L, PCE = 5.0 µg/L
- EDB Plume - Concentrations Exceed MMCL = 0.02 µg/L
- Perchlorate Plume - Concentrations Exceed MMCL = 2.0 µg/L
- RDX Plume - Concentrations Exceed EPA 10<sup>3</sup> Risk-Based Level = 0.6 µg/L (IAGWSP) = 0.7 µg/L (IRP)
- Fuel Plume - The Following Contaminants Exceed Associated MCP GW or RSL Groundwater Standards:
  - CS-C8 aliphatic hydrocarbons, GW-I = 300 µg/L
  - CS-C12 aromatic hydrocarbons, GW-I = 200 µg/L
  - CS-C12 aliphatic hydrocarbons, GW-I = 700 µg/L
  - C11-C12 aromatic hydrocarbons, GW-I = 200 µg/L
  - 1,2,4-TMB, RSL = 56 µg/L
  - 1,3,5-TMB, RSL = 60 µg/L
  - 2-methylnaphthalene, GW-I = 10 µg/L
- PFAS Plume - Concentrations Exceed MassDEP PFAS MMCL = 0.02 µg/L (Dashed Where Inferred)
- Plumes with Remedy in Place
- IRP PFAS Source Area
- MMRP Site - Active
- IRP Source Area - Active
- Extraction Well
- Rejection Well (OR)
- Rejection Well (IR)
- Outfall Bubbler
- Treatment Facility
- Municipal Water Supply Well
- Town Boundary
- Infiltration Trench/Gallery (OR)
- with Infiltration Trench/Gallery (IR)
- IRP Land Use Control (LUC) Boundary
- IAGWSP Land Use Control (LUC) Boundary

**Treatment System Pipeline:**

- Influent
- Effluent

Scale: 1 inch = 1 mile  
0.5 1 Miles

The areas of contamination show the combined contaminants of concern within each plume.

Contaminant of Concern (COC)	Type of Contaminant	Risk-Based Level
TCE = trichloroethene	solvent	MCL = 5 µg/L
PCE = perchloroethene	solvent	MCL = 5 µg/L
COCl <sub>2</sub> = carbon tetrachloride	solvent	MCL = 5 µg/L
EDB = ethylene dibromide	fuel-related compound	MMCL = 0.02 µg/L
benzene	fuel-related compound	MCL = 5 µg/L
VOC = vinyl chloride	solvent	MCL = 2 µg/L
1,1,2,2-TeCa = 1,1,2,2-tetrachloroethane	solvent	GW-I = 2 µg/L
1,4-DDB = 1,4-dichlorobenzene	solvent	MCL = 2 µg/L
Mn = manganese	metal	EPA Health Advisory = 300 µg/L
lead	metal	MCL = 2 µg/L
lead	metal	15 µg/L (treatment technique action level for water distribution systems)
silvane	fuel-related compound	MCL = 1,000 µg/L
RDX = hexahydro-1,3,5-trinitro-1,3,5-diazene	explosive	HA = 2 µg/L
		GW-I = 1 µg/L
		10 <sup>3</sup> = 0.6 µg/L (IAGWSP); = 0.7 µg/L (IRP)
perchlorate	oxidizer	HA = 15 µg/L
		MMCL = 2 µg/L
CS-C8 aliphatic hydrocarbons	fuel-related compound	MCL = 300 µg/L
CS-C12 aromatic hydrocarbons	fuel-related compound	GW-I = 200 µg/L
CS-C12 aliphatic hydrocarbons	fuel-related compound	GW-I = 700 µg/L
C11-C12 aromatic hydrocarbons	fuel-related compound	GW-I = 200 µg/L
1,2,4-TMB	fuel-related compound	RSL = 56 µg/L
1,3,5-TMB	fuel-related compound	RSL = 60 µg/L
2-methylnaphthalene	fuel-related compound	GW-I = 10 µg/L
1,4-dioxane	solvent	RG = 0.46 µg/L

## Joint Base Cape Cod Groundwater Plume Map, and IRP and IAGWSP LUC Areas

Issued April 2024

Note: MCL – Maximum Contaminant Level  
 MMCL – Massachusetts Maximum Contaminant Level  
 HA – Federal Lifetime Health Advisory  
 PFAS – Per- and Polyfluoroalkyl substances  
 GW-I – State default cleanup value to be used in lieu of site-specific risk-based level  
 10<sup>3</sup> – EPA level resulting in an excess cancer risk of one in a million  
 RG – Site Specific Risk Based Remediation Goal  
 RSL – Regional Screening Level

## PFAS and 1,4-Dioxane Criteria for Drinking Water:

- May 2016 - EPA issued final Lifetime Drinking Water Health Advisory 2016 (HA) values for Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) of 70 nanograms per liter (ng/L) (0.07 micrograms per liter [ $\mu\text{g/L}$ ]) for each and combined.
- Oct 2020 - MassDEP issued a Massachusetts Maximum Contaminant Level (MMCL) drinking water standard of 20 ng/L (0.02  $\mu\text{g/L}$ ) for the sum of six PFAS (PFAS6) compounds: PFOS, PFOA, Perfluorononanoic Acid (PFNA), Perfluorohexane Sulfonic Acid (PFHxS), Perfluoroheptanoic Acid (PFHpA), and Perfluorodecanoic Acid (PFDA).
- May 2022 - EPA published updates to its Regional Screening Levels (RSLs) which included 5 PFAS.
- Jun 2022 - EPA issued Interim Updated Drinking Water HAs for PFOS and PFOA and Final HAs for Perfluorobutane Sulfonic Acid (PFBS) and Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) (referred to as GenX); EPA noted that Superfund sites should use updated RSLs since Interim HAs are still undergoing EPA Science Advisory Board review.
- Mar 2023 – EPA published proposed Maximum Contaminant Levels (MCLs) of 4 ng/L (0.004  $\mu\text{g/L}$ ) for PFOS and for PFOA and a Hazard Index based MCL of 1 for PFHxS, PFNA, PFBS, and GenX.
- May 2023 and Nov 2023 - EPA published updates to its RSLs which included 2 additional PFAS with each update.
- EPA RSL of 460 ng/L (0.46  $\mu\text{g/L}$ ) for 1,4-dioxane.

1  $\mu\text{g}$  = 1000 ng; multiply the  $\mu\text{g/L}$  concentration by 1,000 to convert the concentration to ng/L.

Concentrations in this presentation are in both  $\mu\text{g/L}$  and ng/L.

## EPA RSLs for PFAS for HQ = 0.1

	Groundwater		Soil		
	ng/L	µg/L	ng/g	µg/kg	mg/kg
PFOS	4	0.004	13	13	0.013
PFOA	6	0.006	19	19	0.019
PFBA	1,800	1.8	7,800	7,800	7.8
PFBS	601	0.601	1,900	1,900	1.9
PFNA	6	0.006	19	19	0.019
PFHxA	990	0.99	3,200	3,200	3.2
PFHxS	39	0.039	130	130	0.13
HFPO-DA	1.5	0.0015	23	23	0.023
TFSI*	590	0.59	2,300	2,300	2.3
PFPrA*	980	0.98	3,900	3,900	3.9

**Notes:**

Screening values for resident potable use of groundwater and resident ingestion and dermal contact with soil are based on an HQ of 0.1 and CR of 1E-06 and were obtained from EPA’s RSL table (<https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>).

The EPA RSLs for soil do not consider leaching from soil to groundwater.

PFAS RSLs listed per DoD Guidance (and reference 2024 website <https://www.acq.osd.mil/eie/eer/ecc/pfas/pfas101/rsl.html>).

\*There are no current EPA-approved analytical methods for these two PFAS.

**Key:**

CR = Cancer Risk

EPA = U.S. Environmental Protection Agency

HFPO-DA = Hexafluoropropylene oxide dimer acid (GenX)

HQ = Hazard Quotient

mg/kg = milligram per kilogram

ng/g = nanogram per gram

ng/L = nanogram per liter

RSL = EPA Regional Screening Level

µg/kg = microgram per kilogram

µg/L = microgram per liter

Per- and Polyfluoroalkyl Substances (PFAS)

PFBA = Perfluorobutanoic Acid

PFBS = Perfluorobutane Sulfonic Acid

PFHxA = Perfluorohexanoic acid

PFHxS = Perfluorohexane Sulfonic Acid

PFNA = Perfluorononanoic Acid

PFOA = Perfluorooctanoic Acid

PFOS = Perfluorooctane Sulfonic Acid

PFPrA = Perfluoropropanoic acid

TFSI = Bis(trifluoromethylsulfonyl)amine

## **Response Actions (related to public/community water supply wells):**

- Eight public/community water supply wells were sampled by AFCEC between 2017 and 2022; two had PFOS+PFOA concentrations greater than the 2016 HA.
  - Mashpee Village Public Water Supply Well (PWSW) was taken offline in Feb 2017; AFCEC installed a wellhead treatment system and well returned to service on 14 Feb 2020.
  - Community Water Supply Well for a neighborhood in Mashpee was disconnected and 93 residences were connected to municipal water supply in 2018.
- Two Mashpee PWSWs, Turner Road wells #2 and #5, had PFAS6 concentrations greater than the MMCL but below the 2016 HA; both wells were taken offline (Feb 2019 and Jul 2020).
  - In Jan 2022, AFCEC JBCC obtained approval from the Air Force to provide response actions to PWSWs with PFAS6 concentrations greater than the MMCL but below the 2016 HA. AFCEC installed wellhead treatment and both wells were returned to service on 02 Nov 2023.
- The Falmouth Fresh Pond PWSW had PFAS6 concentrations greater than the MMCL but below the 2016 HA in May 2019; the well was taken offline in Apr 2017 for perchlorate.
  - AFCEC completed installation of wellhead treatment and the well was returned to service on 16 Jun 2022.

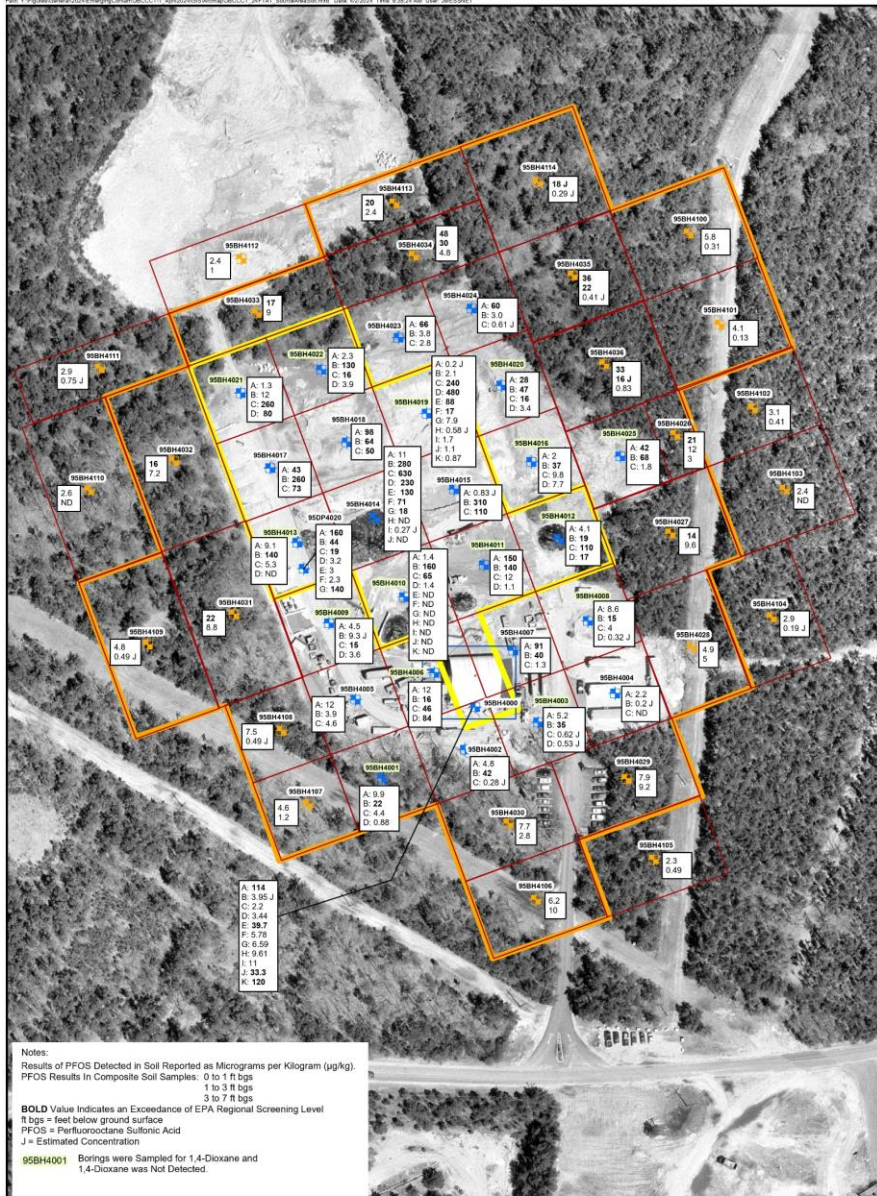
## **Response Actions (related to private wells):**

- 125 private residential drinking water wells have been sampled for PFAS in Mashpee, Falmouth, and Bourne since 2015.
  - AFCEC connected 15 residences to municipal water between 2017 and 2019 due to an exceedance of the 2016 HA.
- In Jan 2022, AFCEC JBCC obtained approval from the Air Force to provide response actions to residences that had private wells with PFAS6 concentrations greater than the MMCL but below the 2016 HA and took over bottled water delivery from MassDEP for 10 residences.
  - AFCEC connected eight of these residences to municipal water supply in May 2022.
  - One residence received a residential point-of-entry filtration system.
  - One residence is receiving bottled water until PFAS6 concentrations are consistently below the MMCL.
- An additional 13 residential point-of-entry filtration systems were installed by AFCEC.
  - Four were removed when connections to municipal water were completed.
  - Nine are no longer maintained by AFCEC because concentrations either decreased below the MMCL or connections to municipal water were completed; these systems have been turned over to the property owners.
- AFCEC completed installation of a water main in Bourne and connected seven residences to municipal water in Jan 2022.

## FTA-1 Supplemental RI/FS Summary:

- The Supplemental RI field program was completed between 2015 and 2022 and included groundwater, soil, surface water, sediment, private well, public water supply well, and treatment system sampling.
- Previously referred to as Ashumet Valley, source areas include the former FTA-1 and former base Sewage Treatment Plant (STP); application of aqueous film-forming foam (AFFF) during fire training activities at FTA-1 is the primary source for the PFAS contamination. 1,4-Dioxane is not detected above the RSL in groundwater and is not a contaminant of concern.
- *Draft Supplemental Remedial Investigation Report for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances at Fire Training Area-1* was submitted to the agencies (EPA and MassDEP) for review on 29 Apr 2022.
- Addressed agency comments which included a re-evaluation of human health risk considering May 2022 RSLs, sampling groundwater for GenX, and additional soil sampling, and a *Revised Draft Supplemental RI Report* was submitted to the agencies for review on 10 Mar 2023.
- Addressed agency comments which included adding an evaluation of human health risk from fish consumption, received agency concurrence, and the *Final Supplemental RI Report* was submitted on 02 Apr 2024.
- *Revised Draft Feasibility Study Report for Per- and Polyfluoroalkyl Substances at Fire Training Area-1* is being completed to evaluate remedial alternatives for PFAS in groundwater.
- A lysimeter study is being performed at FTA-1 to develop a site-specific soil-to-groundwater leaching value for PFAS and these results will be included in a separate JBCC Soil OU FS.
- *Draft Explanation of Significant Differences for Per- And Polyfluoroalkyl Substances at Fire Training Area-1* was submitted to the agencies for review on 05 Apr 2024.



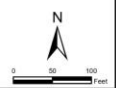


Notes:  
 Results of PFOS Detected in Soil Reported as Micrograms per Kilogram (µg/kg).  
 PFOS Results in Composite Soil Samples: 0 to 1 ft bgs  
 1 to 3 ft bgs  
 3 to 7 ft bgs  
**BOLD** Value Indicates an Exceedance of EPA Regional Screening Level  
 ft bgs = feet below ground surface  
 PFOS = Perfluorooctane Sulfonic Acid  
 J = Estimated Concentration  
**95BH4001** Borings were Sampled for 1,4-Dioxane and 1,4-Dioxane was Not Detected.

**Legend**

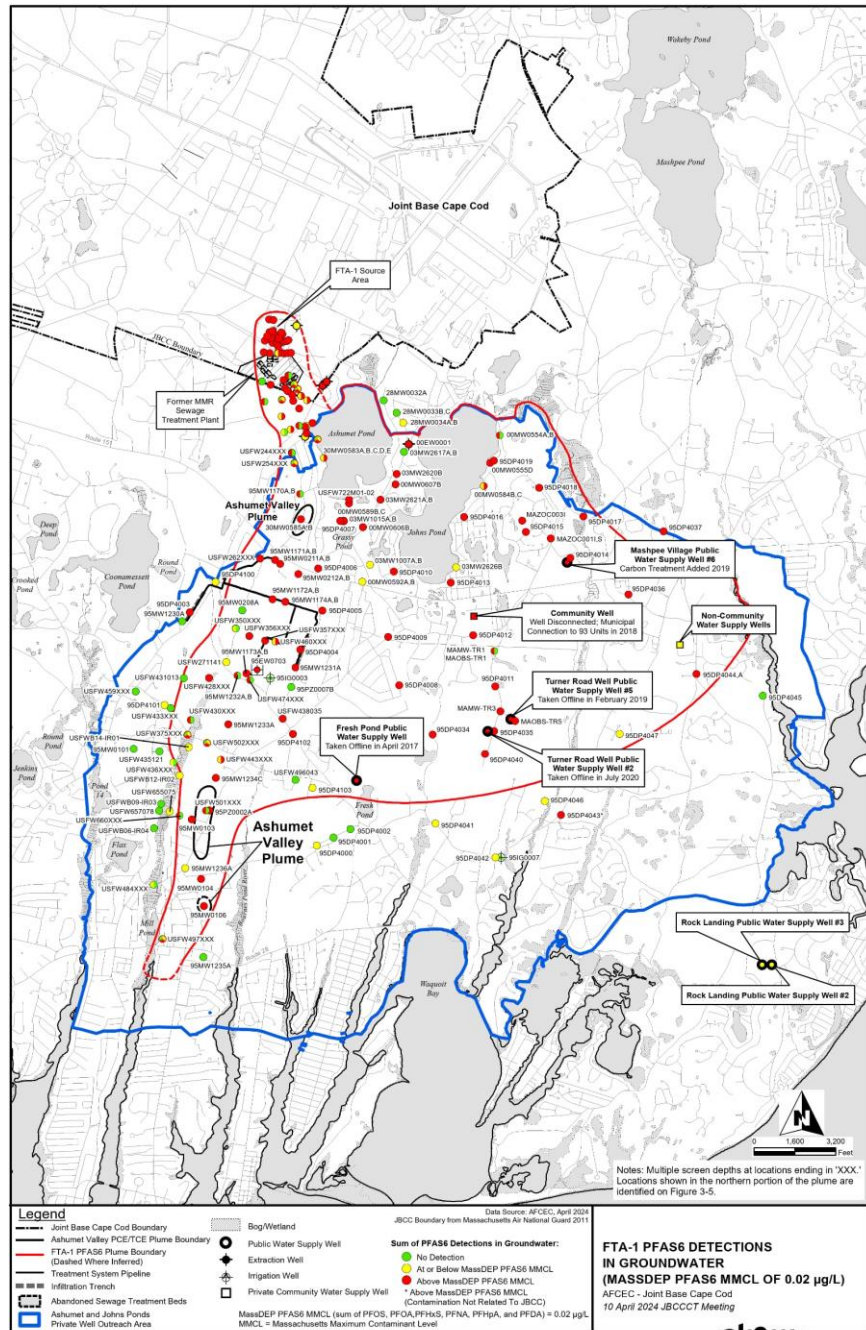
- Soil Boring
- Composite Soil Sample
- Thermal Treatment Unit Fire Area
- Soil Sampling Grid
- Area Above the Soil-to-Water Leaching Value of 4 µg/kg for PFOS
- Area Above 100 µg/kg for PFOS

Data Source: AFCEC, April 2004  
 1997 Aerial Photography from AFCEC



**FTA-1 SOIL SAMPLING LOCATIONS AND PFOS RESULTS IN SOIL**  
 AFCEC - Joint Base Cape Cod  
 10 April 2024 JBCCT Meeting

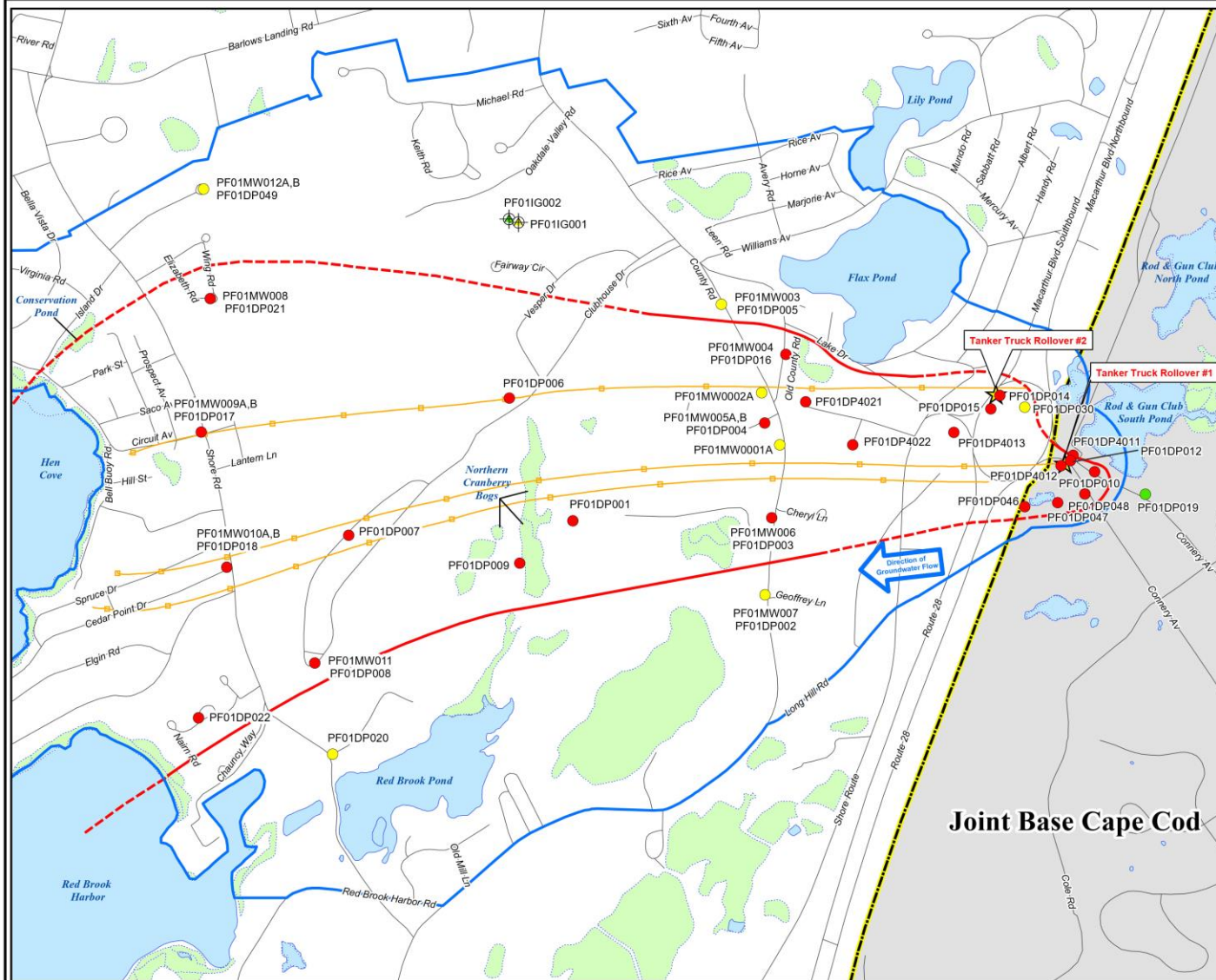




## TTRS RI/FS Summary:

- The RI field program was completed between 2018 and 2022 and included groundwater, soil, surface water, sediment, shellfish tissue, and private well sampling.
- The source of the PFAS was the application of AFFF as part of an emergency response to two tanker truck rollovers at or near the Route 28 traffic rotary in 1997 and 2000.
- The *Draft Remedial Investigation Report for Per- and Polyfluoroalkyl Substances at Tanker Truck Rollover Sites* was submitted to the agencies on 07 Mar 2022.
- Addressed agency comments which included a re-evaluation of human health risk considering May 2022 RSLs, sampling groundwater for GenX, and incorporating results of shellfish tissue sampling conducted in Apr 2022.
- A *Revised Draft RI Report* was submitted to the agencies on 20 Jan 2023.
- Held a resolution meeting with the agencies on 15 Nov 2023 and a memorandum of resolution (MOR) was submitted on 30 Nov 2023; received additional EPA comments on 21 Dec 2023, currently waiting for MassDEP comments.
- The *Draft Feasibility Study Report for Per- and Polyfluoroalkyl Substances at Tanker Truck Rollover Sites* was submitted to the agencies on 16 Mar 2023, received agency comments and a Revised Draft FS Report is in preparation.





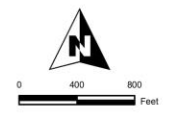
**Legend**

- Outreach Area
- ★ Tanker Truck Rollover Site
- Joint Base Cape Cod Boundary
- Particle Track With 1-Year Time Markers
- TTRS PFAS6 Plume Boundary (Dashed Where Inferred)
- ⊕ Irrigation Well

**Sum of PFAS6 Detections in Groundwater**

- PFAS6 = 0
- PFAS6 Greater Than 0 and At or Below MMCL
- PFAS6 Above MMCL

MassDEP PFAS6 MMCL (sum of PFOS, PFOA, PFHxS, PFNA, PFHpA, and PFDA) = 0.02 µg/L  
 MMCL = Massachusetts Maximum Contaminant Level



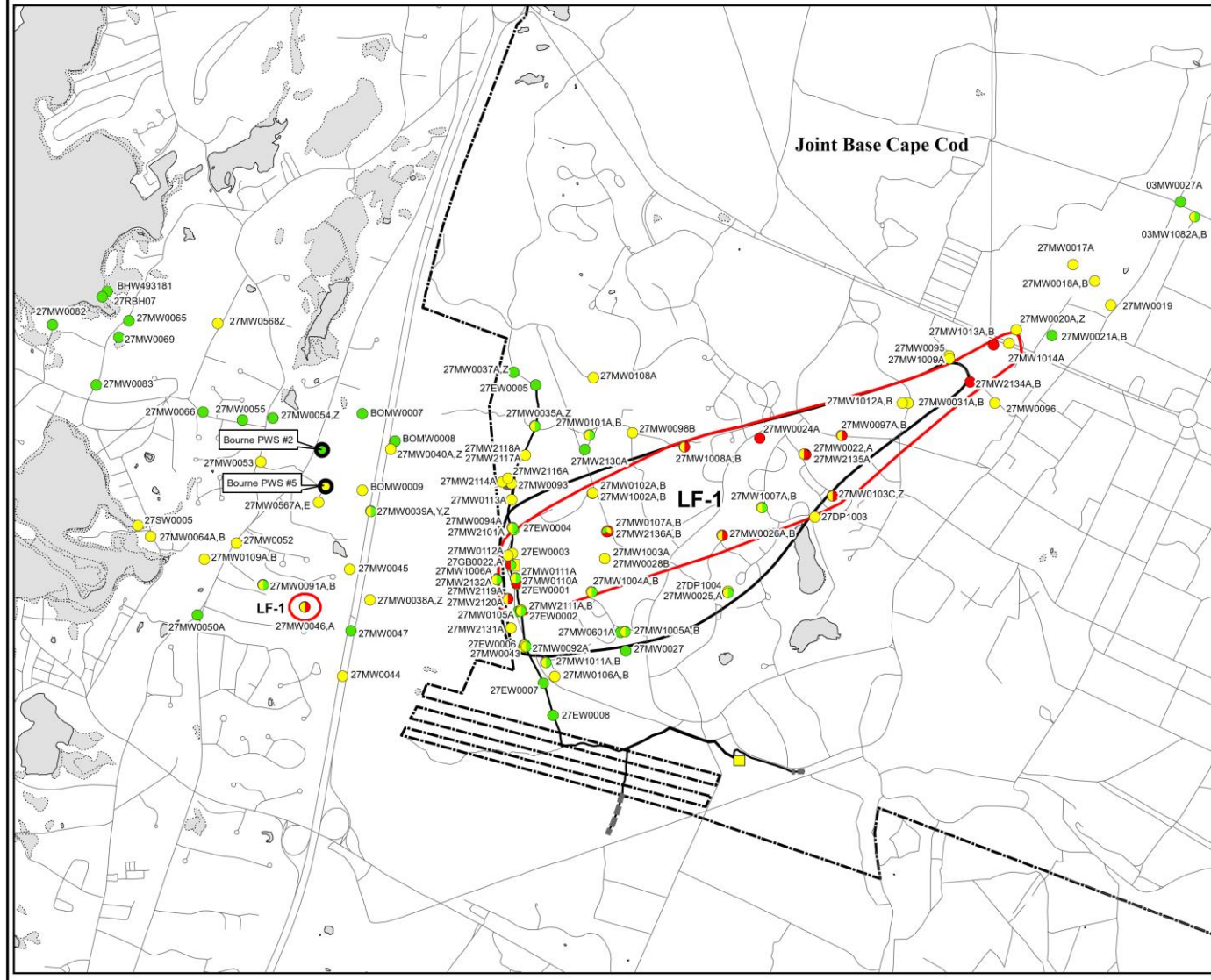
Data Source:  
 AFCEC, April 2024  
 JBCC Boundary from Massachusetts Air National Guard 2011

**TANKER TRUCK ROLLOVER SITES PFAS6  
 DETECTIONS IN GROUNDWATER**  
 AFCEC - Joint Base Cape Cod  
 10 April 2024 JBCCCT Meeting



## **LF-1 Supplemental FS:**

- A Supplemental FS was prepared at LF-1 to evaluate remedial alternatives for groundwater for 1,4-dioxane and PFAS.
- Three alternatives were evaluated for PFAS and 1,4-dioxane: no additional action, existing remedial system with monitored natural attenuation (MNA) and land use controls (LUCs), and existing system supplemented by two additional extraction wells in the main body of the plume with MNA and LUCs.
- *Draft Supplemental FS Report* was submitted to the agencies on 12 Jan 2022, comments were received, and the response to comments letter (RCL) was submitted on 11 May 2022.
- Addressed agency comments which included a re-evaluation of human health risk considering May 2022 RSLs and sampling groundwater for GenX and the *Final LF-1 Focused Supplemental Feasibility Study Report for 1,4-Dioxane and PFAS at Landfill-1* was submitted on 21 Dec 2023.
- *Draft Explanation of Significant Difference for 1,4-Dioxane and PFAS at Landfill-1, JBCC, MA* was submitted to the agencies on 19 Dec 2023; received agency comments in Feb 2024 and submitted response to comment letter on 11 Mar 2024.



- Legend**
- Joint Base Cape Cod Boundary
  - LF-1 VOC Plume Boundary
  - 1,4-Dioxane Plume Boundary
  - Infiltration Trench/Gallery
  - Treatment System Pipeline
  - Treatment Facility
  - Bog/Wetland
  - ◆ Extraction Well (On)
  - Public Water Supply Well

- 1,4-Dioxane Detections in Groundwater:**
- No Detections
  - Detection Below or At EPA RG
  - Detection Above EPA RG

1,4-Dioxane EPA Site-Specific Risk Based Remediation Goal (RG) = 0.46 µg/L

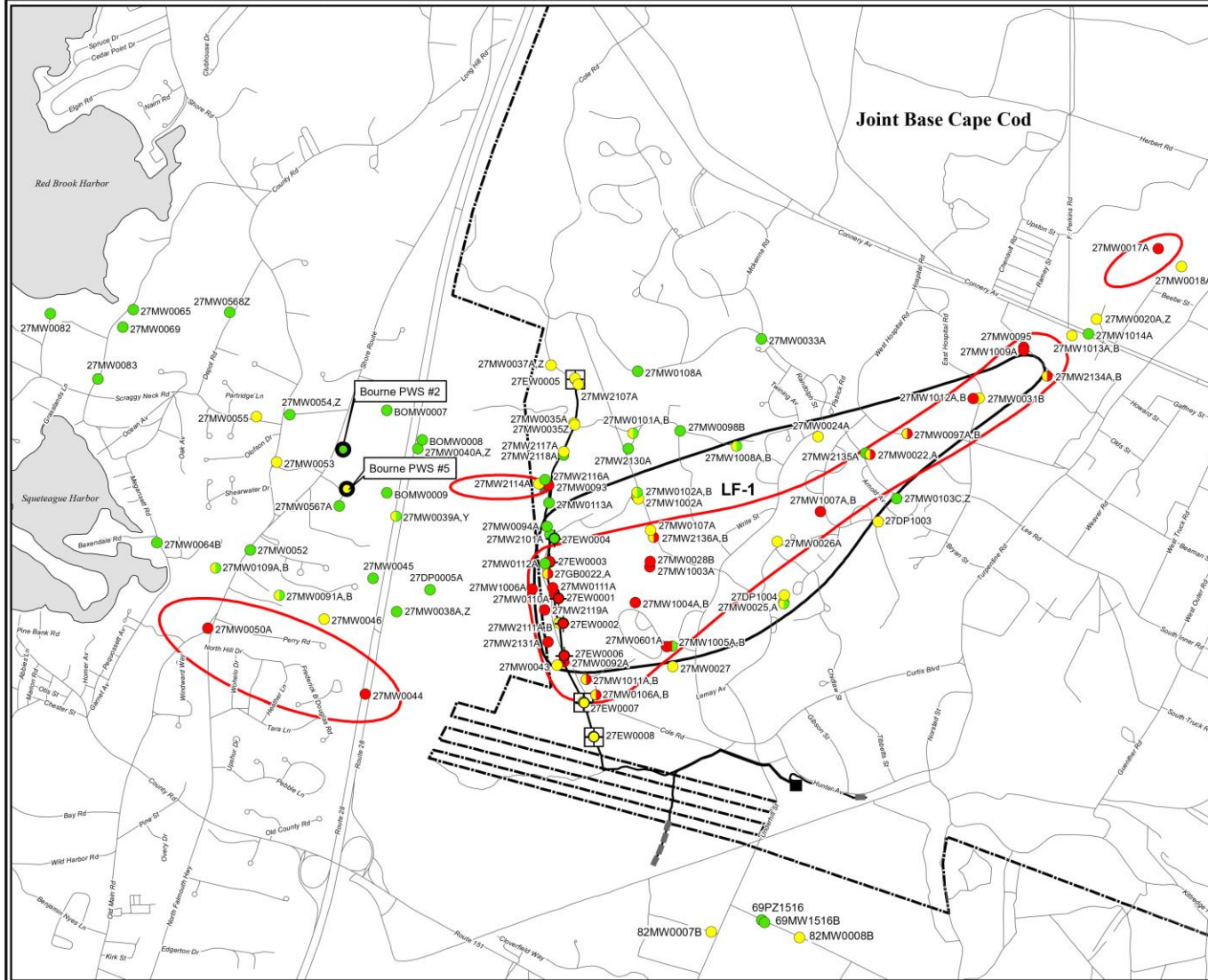


Data Source: AFCEC, April 2024  
JBCC Boundary from Massachusetts Air National Guard 2011

**LF-1 1,4-DIOXANE  
DETECTIONS IN GROUNDWATER**  
AFCEC - Joint Base Cape Cod  
10 April 2024 JBCCCT Meeting







**Legend**

- Joint Base Cape Cod Boundary
- - - LF-1 VOC Plume Boundary (Dashed Where Inferred)
- LF-1 PFAS6 Plume Boundary
- ▬▬▬ Infiltration Trench/Gallery
- Treatment System Pipeline
- Treatment Facility
- ▨ Bog/Wetland
- ◆ Extraction Well (On)
- ◻ Extraction Well (Off)
- Public Water Supply Well

**Sum of PFAS6 Detections in Groundwater:**

- No Detections
- At or Below MassDEP PFAS6 MMCL
- Above MassDEP PFAS6 MMCL

MassDEP PFAS6 MMCL (sum of PFOS, PFOA, PFHxS, PFNA, PFHpA, and PFDA) = 0.02 µg/L  
 MMCL = Massachusetts Maximum Contaminant Level

Note: Samples collected prior to January 2021 did not include PFDA in the PFAS analyte list.

0 840 1,680 Feet

Data Source: AFCEC, April 2024  
 JBCC Boundary from Massachusetts Air National Guard 2011

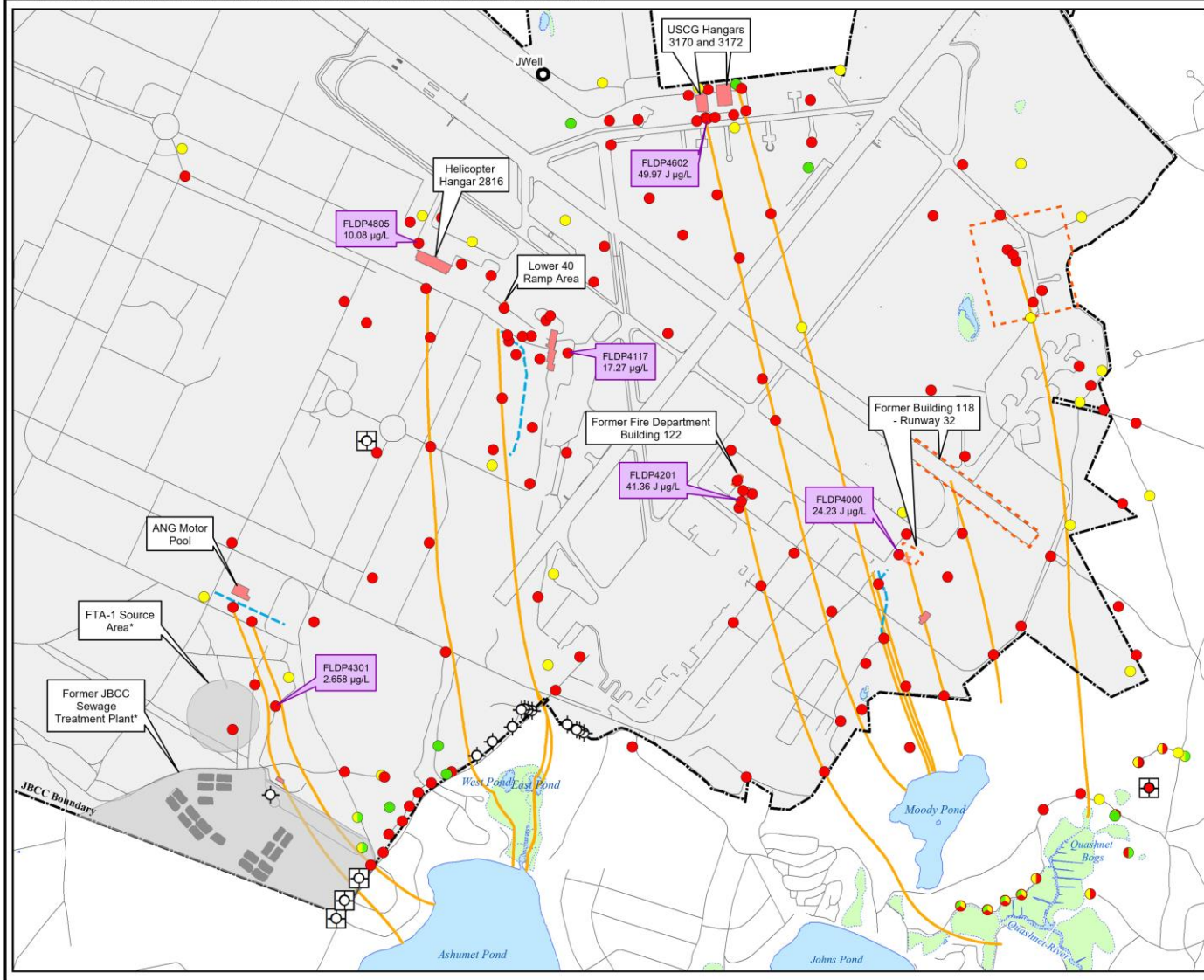
**LF-1 PFAS6 DETECTIONS IN GROUNDWATER**  
 AFCEC - Joint Base Cape Cod  
 10 April 2024 JBCCCT Meeting



## Flight Line Area RI:

- An RI is in process at six Flight Line Area sites collectively referred to as the Flight Line Area Operable Unit; field program includes groundwater, soil, surface water, and sediment sampling.
  - Air National Guard Motor Pool
  - Former Building 118 - Runway 32
  - Former Fire Department Building 122
  - Coast Guard Hangars 3170 and 3172
  - Lower 40 Ramp Area
  - Army Helicopter Hangar 2816
- *Final Remedial Investigation Work Plan for Per- and Polyfluoroalkyl Substances at the Flight Line Operable Unit, Joint Base Cape Cod, MA* was submitted to agencies on 17 Oct 2022.
- *Draft Interim LUCs letter for the Wastewater Treatment Plant (WWTP) Infiltration Bed Site* was submitted to the agencies on 13 Apr 2023; working through EPA comments; MassDEP did not have any comments.
  - PFAS detected at the WWTP infiltration beds are primarily related to discharges to the sewer lines serving the Lower 40 Ramp Area and the Former Fire Department Building 122 and will be associated with these two sites.
  - Interim LUCs will be implemented at the WWTP infiltration beds to prevent exposure to the PFAS contaminated groundwater and the WWTP site will be administratively closed.





**Legend**

- Groundwater Model Particle Track
- Storm Drainage Ditch
- Approximate Site Boundary
- Joint Base Cape Cod Boundary
- Existing Structure
- Former Structure
- Abandoned Cranberry Bog/Wetland
- Abandoned Sewage Treatment Beds
- Public Water Supply Well
- Extraction Well (Off)
- ReInjection Well (On)
- ReInjection Well (Off)

**49.97 J µg/L**  
Highest PFAS6 Concentration in Groundwater (µg/L) Detected to Date During RI

**Sum of PFAS6 Detections in Groundwater From Flight Line Area Site Inspections:**

- PFAS6 = 0
- PFAS6 Greater Than 0 and At or Below the MMCL
- PFAS6 Above the MMCL

MassDEP PFAS6 MMCL (sum of PFOS, PFOA, PFHxS, PFNA, PFHpA, and PFDA) = 0.02 µg/L  
MMCL = Massachusetts Maximum Contaminant Level

\*Sites Being Investigated Under the FTA-1 Remedial Investigation



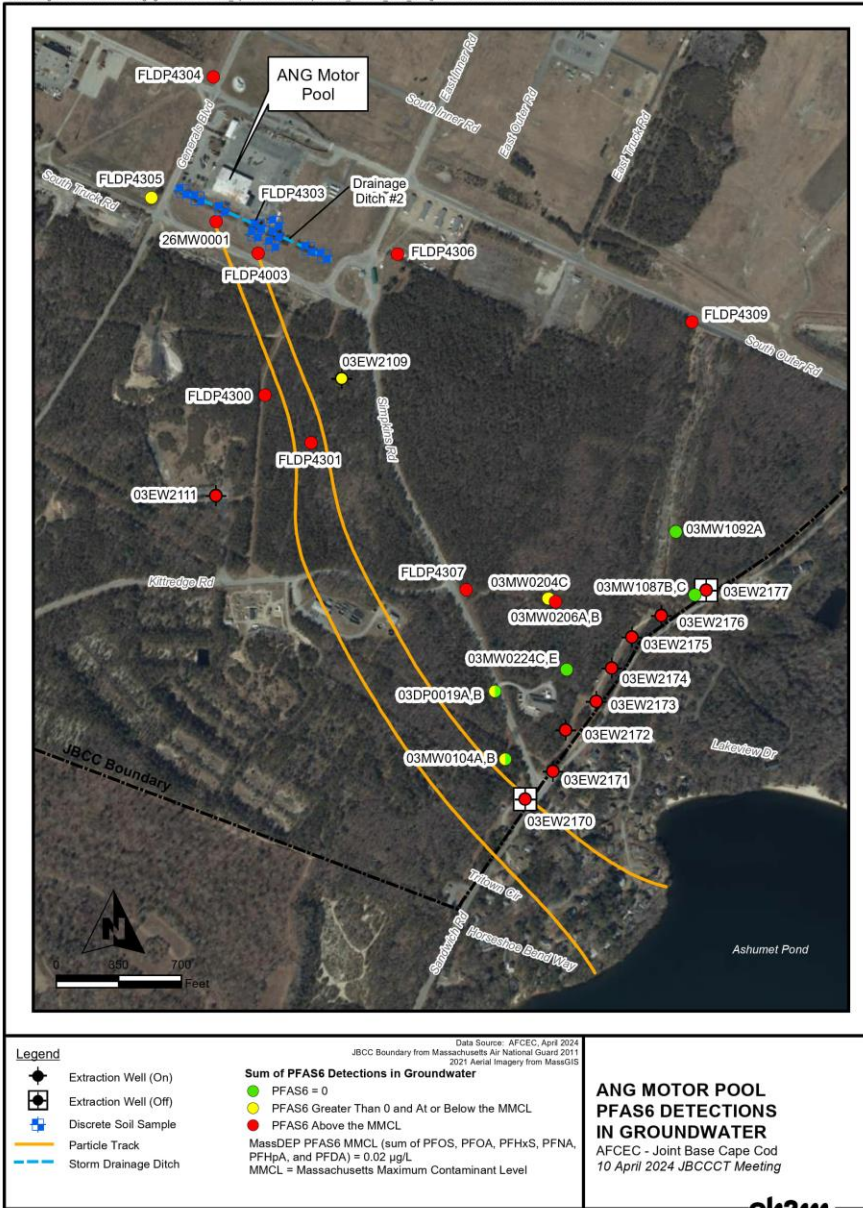
Data Source: AFCEC, April 2024  
JBCC Boundary from Massachusetts Air National Guard 2011

**FLIGHT LINE OPERABLE UNIT SITES**  
AFCEC - Joint Base Cape Cod  
10 April 2024 JBCCCT Meeting



# Flight Line Operable Unit RI - ANG Motor Pool:

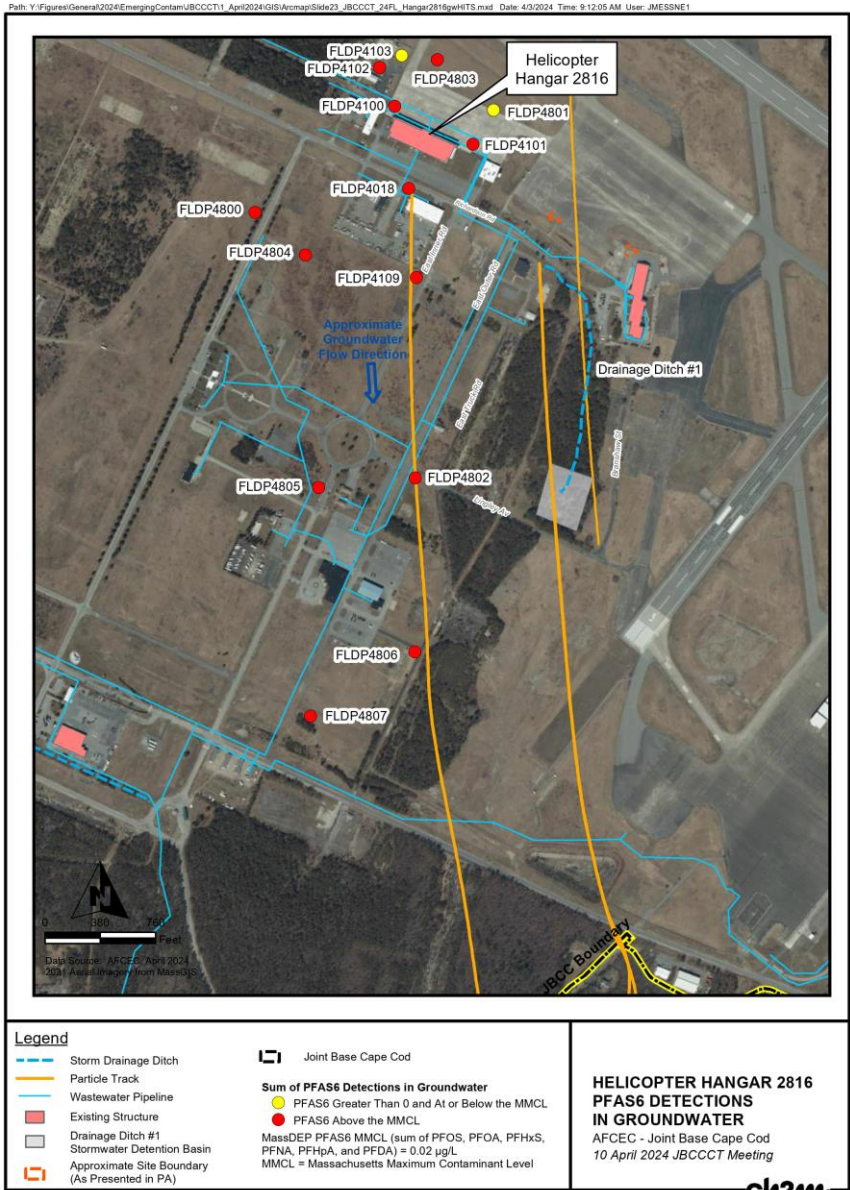
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- Jet propulsion-4 fuel spilled from a 5,000-gallon refueler truck at the Vehicle Maintenance Building in 1984 and AFFF was applied as a response action.
- Collected groundwater samples from 8 borings, 10 extraction wells, and 13 monitoring wells; highest PFAS6 concentration is 2,658 ng/L (2.658 µg/L) in boring FLDP4301 which is located to the south and downgradient of the source area.
- PFAS6 groundwater contamination extends to the base boundary and the Chemical Spill-10 Sandwich Road extraction fence.
- Collected soil samples from 7 borings; PFOS is the predominant PFAS, and highest PFOS soil concentration is 410 µg/kilogram (kg) in boring FLDP4303 located near the outfall pipe at the eastern end of the trench.
- *Completed 3 additional soil borings to further define the extent of soil contamination.*

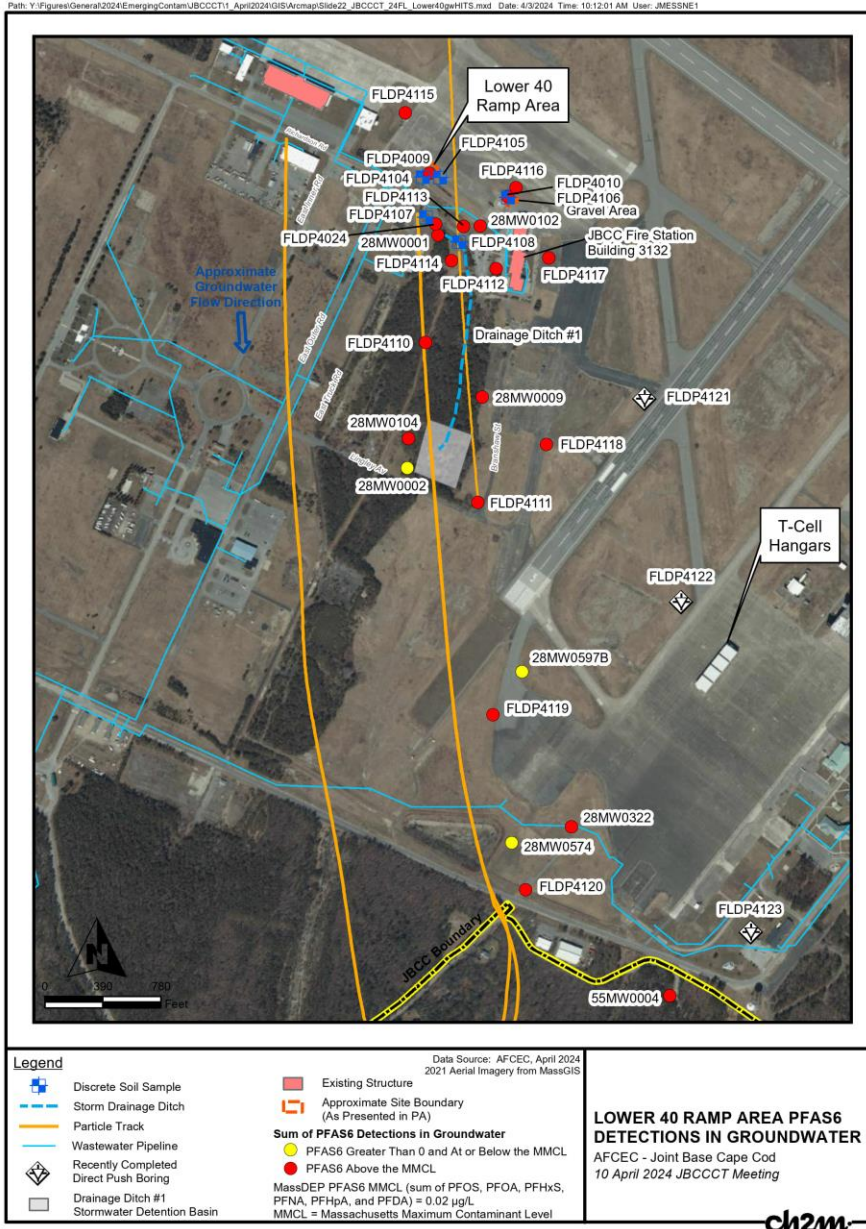


# Flight Line Area Operable Unit RI - Army Helicopter Hangar 2816:



- AFFF was stored outside of the hangar but was not used and there are no documented AFFF releases at this hangar.
- Collected groundwater samples from nine borings; highest PFAS6 groundwater concentration is 10,080 ng/L (10.08 µg/L) in boring FLDP4805.
- *Five additional groundwater borings were completed for further definition of the extent of groundwater contamination.*
- Soil samples were collected at four source area borings; PFOS is the predominant PFAS, and highest PFOS soil concentration is 510 ng/kg (0.51 J µg/kg) at FLDP4102.

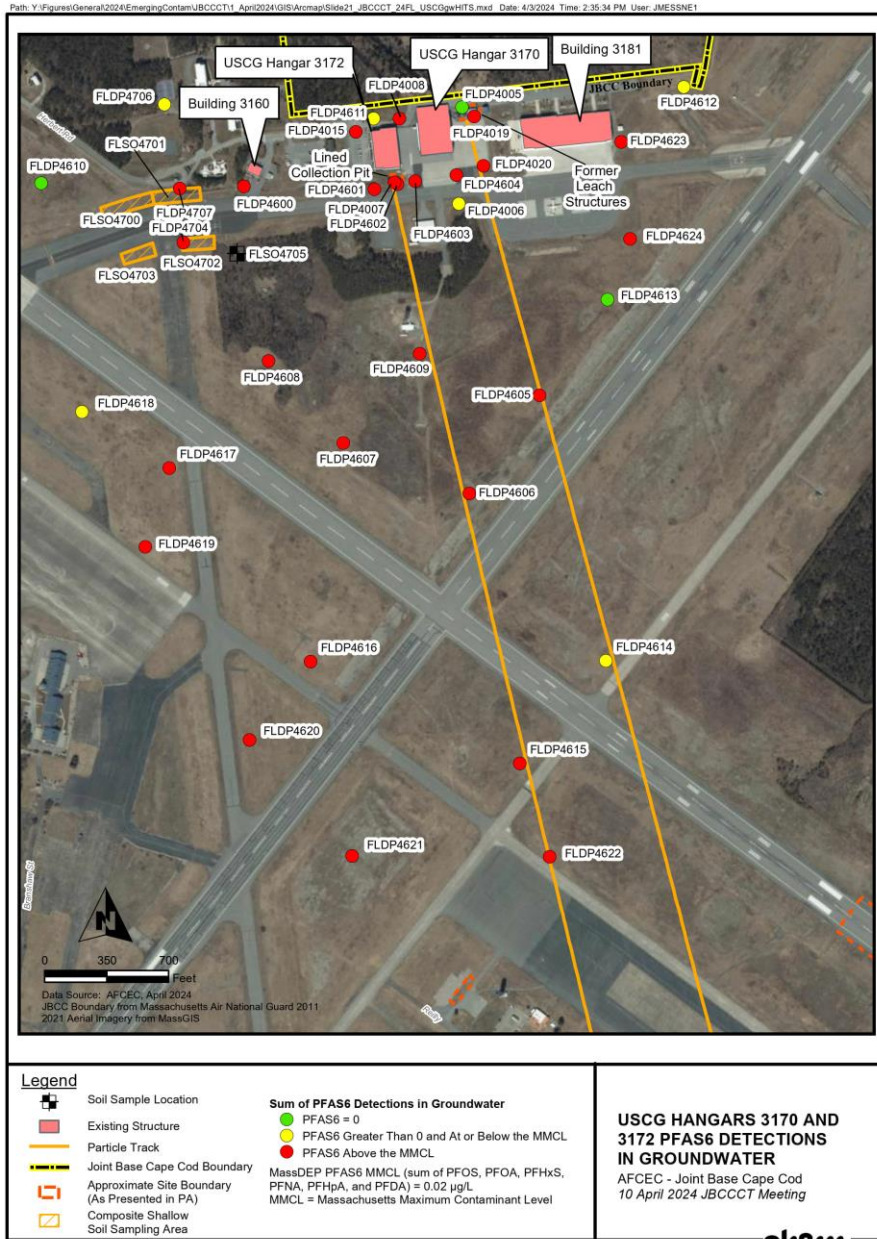
# Flight Line Area Operable Unit RI - Lower 40 Ramp Area:



- AFFF was stored at the current Fire Station area; hoses containing residual AFFF were flushed to the ground surface after responding to emergencies; and accidental releases of AFFF occurred during training.
- Collected groundwater samples from 6 monitoring wells and 14 borings; highest PFAS6 groundwater concentration is 17,270 ng/L (17.27 µg/L) in boring FLDP4117, located to the east of the Fire Station; groundwater contamination extends to the base boundary.
- Three additional groundwater borings were completed for further definition of the extent of groundwater contamination.
- Surface water samples were collected from East and West Pond; PFOS is the predominant PFAS, and highest PFOS concentration is 220 ng/L (0.22 µg/L) in a sample from East Pond.
- Soil samples were collected at five borings; PFOS is the predominant PFAS, and highest PFOS soil concentration is 70,000 ng/kg (70 µg/kg) at FLDP4108, located in Drainage Ditch #1.
- Thirteen areas for composite soil sampling and four additional borings near Drainage Ditch #1 were identified for further definition of the extent of soil contamination.



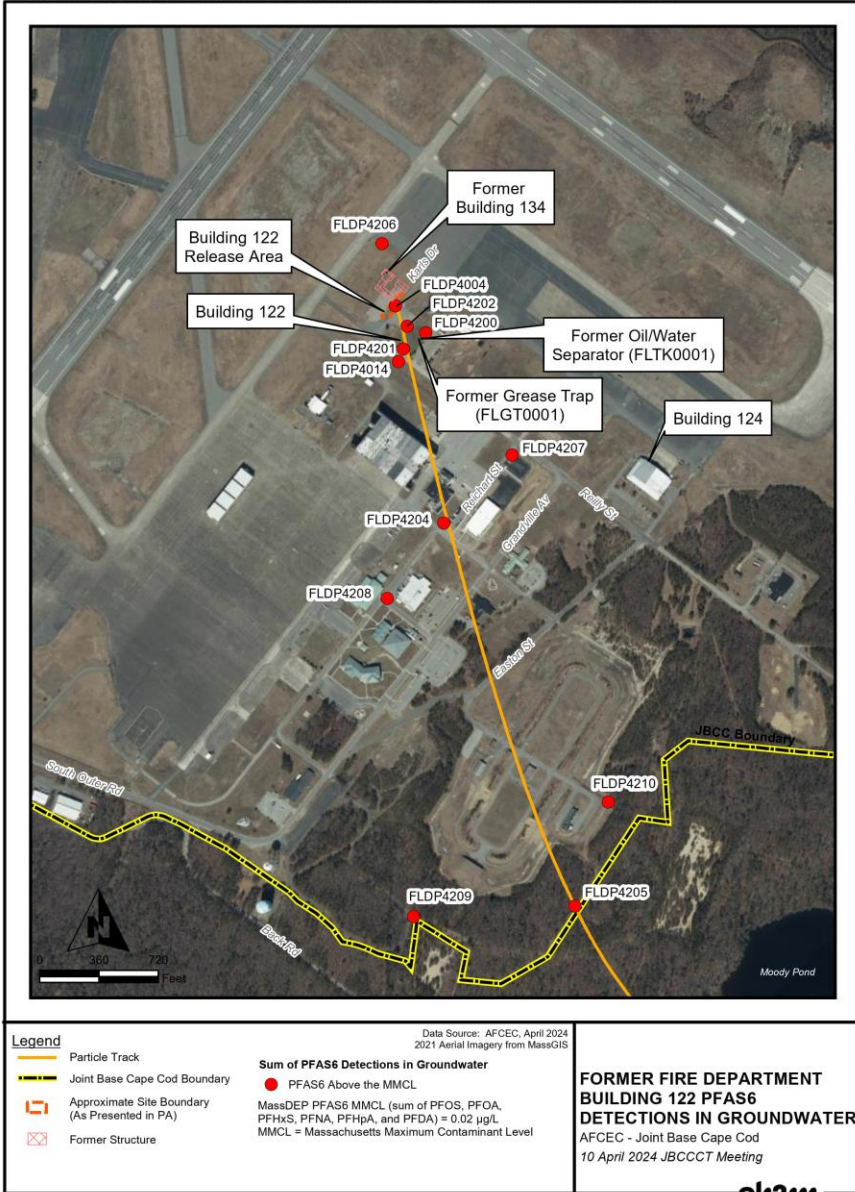
# Flight Line Operable Unit RI - USCG Hangars 3170 and 3172 :



- AFFF was stored at the Hangars and was released during fire suppression system testing and other accidental releases occurred.
- The field program was expanded to include Building 3160 and the West Delta Hot Fuel Spot Training Area, located to the west of the hangars.
- Collected groundwater samples from 28 borings; highest PFAS6 groundwater concentration is 49,970 J ng/L (49.97 J µg/L) in source area boring FLDP4602.
- *Seven additional groundwater borings were completed for further definition of the extent of groundwater contamination.*
- Soil samples were collected from six borings and four composite sampling grid cells; PFNA is the predominant PFAS, and highest PFNA soil concentration is 8,900 ng/kg (8.9 µg/kg) at FLSO4608.
- *Fifteen additional soil borings were completed for further definition of the extent of soil contamination.*
- Asphalt samples were collected from two borings; no PFAS were detected.

# Flight Line Area Operable Unit RI - Former Building 122:

Path: Y:\Figures\General\2024\EmergingContam\UBCCCT\1 April2024\GIS\Arcmap\Slide20\_JBCCCT\_24FL\_Bldg122peHTS.mxd Date: 4/2/2024 Time: 4:28:14 PM User: JMESSE1



- Previous Fire Department - AFFF stored in vehicles and some accidental AFFF releases occurred during training.
- Collected groundwater samples from 12 groundwater borings; highest PFAS6 groundwater concentration is 41,360 J ng/L (41.36 J µg/L) in source area boring FLDP4201; groundwater contamination extends to the base boundary.
- Soil samples were collected at 10 source area borings; PFOS is the predominant PFAS, and highest PFOS soil concentration to date is 330,000 ng/kg (330 µg/kg) at FLDP4202.
- PFAS are also present in asphalt samples; concrete and sediment from inside drains, and in water samples from the grease trap and oil/water separator.



# Flight Line Area Operable Unit RI - Former Building 118 and Runway 32:



- Time and distance testing was conducted annually for 10 years, and area was used to flush hoses containing residual AFFF after responding to emergencies; area has been expanded to include PFAS contamination to the east.
- Collected groundwater samples from 39 monitoring wells and 33 borings, highest PFAS6 groundwater concentration is 24,230J ng/L (24.23J µg/L) at source area boring FLDP4000; groundwater contamination extends past the base boundary.
- *Completed 4 of 7 additional groundwater borings for further definition of the extent of groundwater contamination.*
- Surface water samples were collected from Moody Pond, a pond to the north, and the Quashnet River and former bogs; PFOS is the predominant PFAS, and highest PFOS concentration is 320 ng/L (0.32 µg/L) in a sample from the Quashnet River.
- Soil samples were collected from 10 borings and 20 grid cells across the source area; PFOS is the predominant PFAS, and highest PFOS soil concentration to date is 140,000 ng/kg (140 µg/kg) at boring FLSO4533 which is located along the western boundary of the source area.
- *Five additional areas were defined for composite soil sampling based on information received about WWTP compost placement.*

## Path Forward:

- Continue private well sampling program and provide bottled water to residences where PFAS6 concentrations in private wells used for potable supply is above the MMCL of 0.02 µg/L.
- Prepare and submit the *Revised Draft FTA-1 Supplemental FS Report for PFAS*.
- Receive agency comments on the *Draft FTA-1 Explanation of Significant Differences (ESD) for PFAS*.
- Receive MassDEP comments/concurrence on the MOR for the *Revised Draft TTRS RI Report for PFAS* and submit the final report.
- Prepare and submit the *Revised Draft FS TTRS Report for PFAS*.
- Resolve agency comments on the *Draft LF-1 ESD for 1,4-Dioxane and PFAS* and finalize with AFCEC and EPA signatures and MassDEP letter of concurrence.
- Resolve EPA comments on the WWTP Infiltration Beds Draft Interim LUCs letter and submit the final letter.
- Continue the Flight Line Area Operable Unit RI field program.
- Present updates to the agencies at Technical Update Meetings and to the public at future JBCC Cleanup Team Meetings.