Discussion Topics for Implementing PFAS MCLs at JBCC:

- Reports and Presentations
  - PFAS Groundwater Detection Figures and PFAS Plume Boundary
  - PFAS Results Summary Tables
- Private Well
  - Transmittal Letter Template
  - Additional Interim Removal Actions May Be Required
- QAPP Update for MCLs for Flight Line RI (DQOs)
- PFAS Background Study

Discussion Topics for Implementing PFAS MCLs at JBCC (continued):

- Revised Draft Feasibility Study Reports (LF-1, FTA-1, and TTRS)
  - Select resampling to confirm conceptual site models due to age of RI PFAS data
  - Updated Human Health Risk Evaluations (confirm/update PFAS COCs)
    - November 2023 RSLs currently DoD approved for use
  - Hazard Index MCL - Regulated under CERCLA, RAOs
  - PFAS Plume Shell(s) for Groundwater Transport Modeling
  - Updated Alternatives Modeling, Cost Estimates, and ARARs
    - Modeling active treatment in area downgradient of the ponds for FTA-1
- EPA Status Update
- MassDEP Status Update

ANG Motor Pool - PFAS Groundwater Results

Example Groundwater Results Table with MCLs

Location	Date	Sample ID	Depth (ft bgs)	PFOS[1] (µg/L) MCL[2] = 0.004 RSL[3] = 0.004	PFOA[1] (µg/L) MCL[2] = 0.004 RSL[3] = 0.006	PFBS[4] (µg/L) RSL[3] = 0.601	PFHpA[1] (µg/L)	PFHxS[1,4] (µg/L) MCL[2] = 0.01 RSL[3] = 0.04	PFNA[1,4] (µg/L) MCL[2] = 0.01 RSL[3] = 0.006	PFDA[1] (µg/L)	PFBA (µg/L) RSL[3] = 1.8	PFHxA (µg/L) RSL[3] = 0.99	GenX[4] (µg/L) MCL[2] = 0.01 RSL[3] = 0.0015	EPA HI[4] (unitless) MCL = 1	PFAS6 [1] (µg/L) MMCL = 0.02
FLDP4310	08/01/2024	CHPZ04310A-O0624	62.5	0.00084 J	0.0017 J	0.0005 J	0.00076 J	ND	0.00088 J	0.00062 J	ND	ND	ND	0.09	0
FLDP4310	08/01/2024	CHPZ04310B-O0624	72.5	ND	ND	ND	ND	ND	ND	0.00068 J	ND	ND	ND	0	0
FLDP4310	08/01/2024	CHPZ04310C-O0624	82.5	**0.011**	0.0056	0.00053 J	0.0034 J	0.0042 J	**0.028**	ND	0.0017 J	0.0031 J	ND	**3.22**	**0.0522 J**
FLDP4310	08/02/2024	CHPZ04310D-O0624	92.5	**0.007**	0.0021 J	ND	0.0028 J	0.0024 J	**0.01**	0.0006 J	0.0017 J	0.0027 J	ND	**1.24**	**0.0243 J**
FLDP4310	08/02/2024	CHPZ04310E-O0624	102.5	**0.041**	**0.0061**	0.0018 J	0.0029 J	0.012	**0.014**	0.00071 J	0.0031 J	0.0046	ND	**2.6**	**0.076 J**
FLDP4310	08/02/2024	CHPZ04310F-O0624	112.5	**0.0067**	**0.0098**	0.0005 J	0.0065	0.002 J	**0.22**	0.00088 J	0.0029 J	0.0055	ND	**22.2**	**0.245 J**
FLDP4310	08/02/2024	CHPZ04310G-O0624	122.5	ND	0.0023 J	ND	0.002 J	ND	**0.054**	ND	0.0011 J	0.0012 J	ND	5.4	**0.0583 J**
FLDP4310	08/02/2024	CHPZ04310H-O0624	132.5	ND	0.0023 J	0.00056 J	0.00093 J	0.00089 J	ND	ND	0.0011 J	ND	ND	0.09	0.0023 J
FLDP4310	08/02/2024	CHPZ04310I-O0624	142.5	ND	0.0018 J	0.00067 J	0.00071 J	0.0012 J	ND	ND	ND	ND	ND	0.12	0
FLDP4310	08/06/2024	CHPZ04310J-O0624	152.5	ND	0.0015 J	0.00065 J	ND	0.00094 J	ND	ND	ND	ND	ND	0.09	0
FLDP4310	08/06/2024	CHPZ04310K-O0624	162.5	ND	0.00094 J	ND	ND	ND	ND	ND	ND	ND	ND	0	0
FLDP4310	08/06/2024	CHPZ04310L-O0624	172.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0	0

Data Source: AFCEC, October 2024

Key:

ANG = Air National Guard
EPA = U.S. Environmental Protection Agency
ft bgs = feet below ground surface
HI = Hazard Index
HQ = Hazard Quotient
J = estimated concentration
MassDEP = Massachusetts Department of Environmental Protect
MCL = Maximum Contaminant Level
MMCL = Massachusetts Maximum Contaminant Level
ND = not detected
PFAS = Per- and Polyfluoroalkyl Substances
RSL = EPA Regional Screening Level
µg/L = micrograms per liter

Per- and Polyfluoroalkyl Substances (PFAS)

PFBA = Perfluorobutanoic acid
PFBS = Perfluorobutane Sulfonic Acid
PFDA = Perfluorodecanoic Acid
PFHpA = Perfluoroheptanoic Acid
PFHxA = Perfluorohexanoic acid
PFHxS = Perfluorohexane Sulfonic Acid
PFNA = Perfluorononanoic Acid
PFOA = Perfluorooctanoic Acid
PFOS = Perfluorooctane Sulfonic Acid
GenX = Hexafluoropropylene oxide dimer acid (HFPO-DA)

Notes:

1. PFAS included in PFAS6 sum (PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA) established October 2020. PFAS6 MMCL=0.02 µg/L.
   Consistent with reporting convention used by MassDEP drinking water program, only detections greater than 0.002 µg/L are included in the PFAS6 summation.
2. EPA PFAS MCLs established April 2024.
3. EPA RSL values are from the November 2023 EPA RSL table using a Hazard Quotient of 0.1.
4. PFAS included in EPA HI (PFBS, PFNA, PFHxS, GenX), established April 2024. PFAS HI MCL = 1.
5. PFDA was added to the analyte list in January 2021 and PFBA, PFHxA, and GenX were added in 2023.
6. **Bold** text indicates an exceedance of an EPA MCL, EPA RSL, or MMCL.

Example Private Well Table
JBCC - Below MMCL_Above MCL

Location	Sample Date	PFOS[1] (µg/L) MCL[2] = 0.004	PFOA[1] (µg/L) MCL[2] = 0.004	PFBS[3] (µg/L)	PFHpA[1] (µg/L)	PFHxS[1,3] (µg/L) MCL[2] = 0.01	PFNA[1,3] (µg/L) MCL[2] = 0.01	PFDA[1] (µg/L)	GenX[3] (µg/L) MCL[2] = 0.01	Sum of PFAS6 (µg/L) MMCL[1] = 0.02	EPA HI[3] (unitless) MCL=1	Sum of PFAS6 Exceed MMCL? (established October 2020)	MCL Exceeded? (established April 2024)	EPA HI greater than 1? (established April 2024)
APEMS# 32957	05/21/2021	0.0005 J	ND	0.0014 J	ND	0.0022 J	ND	ND	NA	0.0022 J	N/A	No	N/A	N/A
APEMS# 32957	11/16/2021	0.0004 J	0.0016 J	0.0014 J	ND	0.0022 J	ND	ND	NA	0.0022 J	N/A	No	N/A	N/A
APEMS# 32957	07/11/2022	0.00097 J	0.0011 J	0.0027 J	ND	0.0011 J	ND	ND	NA	0	N/A	No	N/A	N/A
APEMS# 32957	11/22/2022	0.00049 J	0.0012 J	0.0017 J	0.00076 J	0.0011 J	ND	ND	NA	0	N/A	No	N/A	N/A
APEMS# 32957	08/01/2023	0.0013 J	0.0013 J	0.0033 J	0.00099 J	0.0011 J	ND	ND	NA	0	N/A	No	N/A	N/A
APEMS# 32957	07/09/2024	0.0012 J	ND	0.0024 J	ND	0.0009 J	ND	ND	ND	0	0.09 J	No	No	No
APEMS# 43472	07/31/2020	0.0012 J	0.0044 J	0.0027 J	ND	0.0017 J	ND	NA	NA	0.0044 J	N/A	N/A	N/A	N/A
APEMS# 43472	05/06/2021	0.0011 J	0.0026 J	0.0058	0.0019 J	0.0017 J	ND	ND	NA	0.0026 J	N/A	No	N/A	N/A
APEMS# 43472	08/06/2021	0.001 J	ND	0.0038 J	0.0015 J	0.0015 J	ND	ND	NA	0	N/A	No	N/A	N/A
APEMS# 43472	07/01/2022	0.0014 J	0.0047 J	0.0047 J	0.0021 J	0.0018 J	ND	ND	NA	0.0068 J	N/A	No	N/A	N/A
APEMS# 43472	08/03/2023	0.0016 J	0.003 J	0.0022 J	0.00073 J	0.0011 J	ND	ND	NA	0.003 J	N/A	No	N/A	N/A
APEMS# 43472	07/15/2024	0.0014 J	**0.0051 J+**	0.0021 J	0.0021 J+	0.0013 J	0.0012 J	ND	ND	0.0072 J	0.25 J	No	Yes	No

Data Source: AFCEC, October 2024

Notes:

1. PFAS included in PFAS6 sum (PFOS, PFOA, PFHpA, PFHxS, PFNA, and PFDA) established October 2020. PFAS6 MMCL=0.02 µg/L.
2. MCLs established April 2024.
3. PFAS included in EPA HI (PFBS, PFNA, PFHxS, GenX), established April 2024. PFAS HI MCL = 1.
4. Consistent with reporting convention used by MassDEP drinking water program, only detections equal to or greater than 0.002 µg/L are included in the PFAS6 summation.
5. **Bold** text indicates an exceedance of an MMCL or MCL.

Key:

AFCEC = Air Force Civil Engineer Center
APEMS = AFCEC Parcel and Easement Management System
J = estimated concentration
J+ = estimated concentrations, biased high
MassDEP = Massachusetts Department of Environmental Protection
MCL = EPA Maximum Contaminant Level
MMCL = Massachusetts Maximum Contaminant Level
µg/L = micrograms per lit
ND = not detected
NA = not analyzed. PFDA was added to the project analyte list in January 2021. HFPO-DA added to analyte list in July 2024.
N/A = Not Applicable. The PFAS6 MMCL of 0.02 µg/L was established in October 2020 and MCLs were established in April 2024.

Per- and Polyfluoroalkyl Substances (P
PFOS = Perfluorooctane Sulfonic Acid
PFOA = Perfluorooctanoic Acid
PFBS = Perfluorbutane Sulfonic Acid
PFHpA = Perfluoroheptanoic Acid
PFHxS = Perfluorohexane Sulfonic Acid
PFNA = Perfluorononanoic Acid
PFDA = Perfluorodecanoic acid
HFPO-DA = Hexafluoropropylene Oxide Dimer Acid

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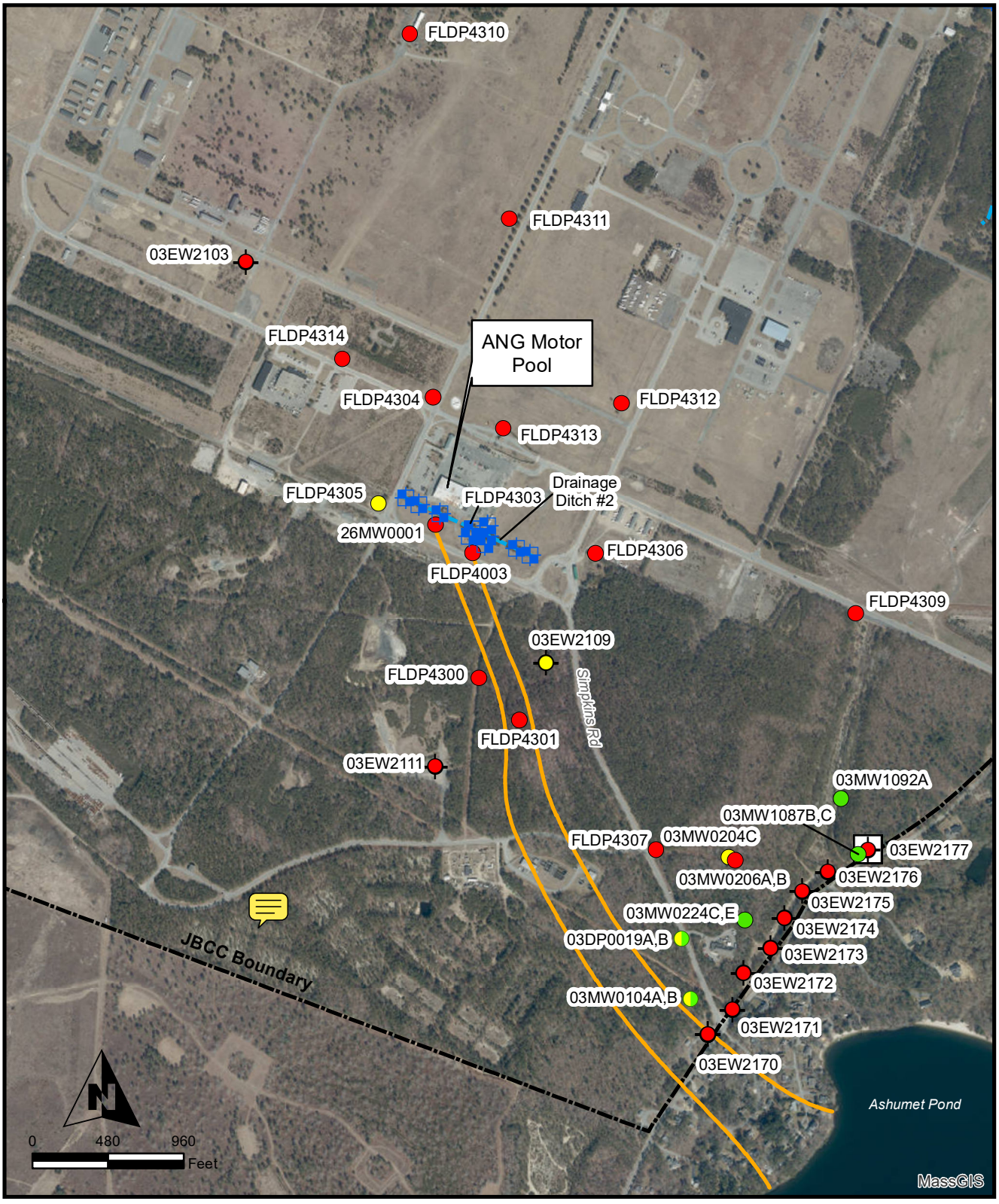

Legend

- Extraction Well (On)
- Extraction Well (Off)
- Discrete Soil Sample
- Particle Track
- Storm Drainage Ditch

Data Source: AFCEC, October 2024
JBCC Boundary from Massachusetts Air National Guard 2011
2023 Aerial Imagery from MassGIS

Sum of PFAS6 Detections in Groundwater

- 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

FIGURE 1

ANG MOTOR POOL PFAS6 DETECTIONS IN GROUNDWATER

AFCEC - Joint Base Cape Cod

23 October 2024 Technical Update Meeting

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Joint Base Cape Cod

FTA-1 Source Area

JBCC Boundary

Former MMR Sewage Treatment Plant

Ashumet Valley Plume

Ashumet Valley Plume

Mashpee Village Public Water Supply Well #6
Carbon Treatment Added 2019

Community Well
Well Disconnected; Municipal Connection to 93 Units in 2018

Non-Community Water Supply Wells

Turner Road Well Public Water Supply Well #5
Taken Offline in February 2019

Turner Road Well Public Water Supply Well #2
Taken Offline in July 2020

Fresh Pond Public Water Supply Well
Taken Offline in April 2017

Rock Landing Public Water Supply Well #3

Rock Landing Public Water Supply Well #2

Wakeby Pond
Mashpee Pond
Ashumet Pond
Johns Pond
Grassy Pond
Deep Pond
Round Pond
Coonamessett Pond
Crooked Pond
Jenkins Pond
Pond 14
Fresh Pond
Flax Pond
Mill Pond
Waquoit Bay
Bourne's Pond River

Route 151
Route 28

28MW0032A
28MW0033B,C
28MW0034A,B
00EW0001
03MW2617A,B
00MW0554A,B
95DP4019
00MW0555D
95DP4018
00MW0584B,C
03MW2620B
00MW0607B
95MW1170A,B
USFW722M01-02
03MW2621A,B
00MW0589B,C
03MW1015A,B
30MW0585A,B
95DP4007
00MW0606B
95DP4016
MAZOC003I
95DP4015
95DP4017
95DP4037
MAZOC001I,S
95DP4014
USFW244XXX
USFW254XXX
30MW0583A,B,C,D,E
95MW1171A,B
95MW0211A,B
USFW262XXX
95DP4006
03MW1007A,B
95DP4010
03MW2626B
95DP4100
95MW0212A,B
00MW0592A,B
95DP4013
95DP4036
95MW1172A,B
95MW1174A,B
95DP4003
95MW1230A
95MW0208A
95DP4005
USFW350XXX
USFW356XXX
USFW357XXX
USFW460XXX
95DP4009
95DP4012
MAMW-TR1
MAOBS-TR1
95MW1173A,B
95DP4004
USFW271141
95EW0703
95MW1231A
95DP4044,A
USFW431013
USFW428XXX
95IG0003
95PZ0007B
95DP4011
95DP4008
95DP4045
USFW459XXX
95MW1232A,B
USFW474XXX
MAMW-TR3
MAOBS-TR5
95DP4101
USFW433XXX
USFW430XXX
USFW438035
95MW1233A
95DP4034
95DP4035
95DP4047
USFWB14-IR01
USFW375XXX
USFW502XXX
95DP4102
95MW0101
USFW435121
USFW443XXX
95DP4040
USFW436XXX
USFW496043
USFWB12-IR02
95MW1234C
95DP4103
USFW655075
95DP4046
USFWB09-IR03
USFW501XXX
95PZ0002A
USFW657078
95DP4043*
USFW660XXX
95DP4041
95MW0103
95DP4002
USFWB06-IR04
95DP4001
95DP4000
95DP4042
95IG0007
95MW1236A
USFW484XXX
95MW0104
95MW0106
USFW497XXX
95MW1235A

0 1,600 3,200 Feet

Notes: Multiple screen depths at locations ending in 'XXX.' Locations shown in the northern portion of the plume are identified on Figure 3-5.

Legend

- Joint Base Cape Cod Boundary
- Ashumet Valley PCE/TCE Plume Boundary
- FTA-1 PFAS6 Plume Boundary (Dashed Where Inferred)
- Treatment System Pipeline
- Infiltration Trench
- Abandoned Sewage Treatment Beds
- Ashumet and Johns Ponds Private Well Outreach Area
- Wampanoag-Owned Parcel
- Bog/Wetland
- Public Water Supply Well
- Extraction Well
- Irrigation Well
- Private Community Water Supply Well

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

Sum of PFAS6 Detections in Groundwater:

- No Detection
- At or Below MassDEP PFAS6 MMCL
- Above MassDEP PFAS6 MMCL
- * Above MassDEP PFAS6 MMCL (Contamination Not Related To JBCC)

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

FTA-1 PFAS6 DETECTIONS IN GROUNDWATER (MASSDEP PFAS6 MMCL OF 0.02 µg/L)

AFCEC - Joint Base Cape Cod

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