MONTHLY PROGRESS REPORT #303
FOR JUNE 2022

EPA REGION I ADMINISTRATIVE ORDERS SDWA 1-97-1019 and 1-2000-0014

JOINT BASE CAPE COD (JBCC)
TRAINING RANGE AND IMPACT AREA

The following summary of progress is for the period from 1 to 30 June 2022.

1. SUMMARY OF REMEDIATION ACTIONS

Remediation Actions (RA) Underway at Camp Edwards as of 24 June 2022:

Demolition Area 1 Comprehensive Groundwater RA

The Demolition Area 1 Comprehensive Groundwater RA consists of the removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. Extraction, treatment, and recharge (ETR) systems at Frank Perkins Road, Base Boundary, and the Leading Edge include extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and injection wells to return treated water to the aquifer.

The Frank Perkins Road Treatment Facility has been optimized as part of the Environmental and System Performance Monitoring (ESPM) program at Demolition Area 1. The treatment facility continues to operate at a flow rate of 175 gallons per minute (gpm), with over 2.925 billion gallons of water treated and re-injected as of 24 June 2022. The following Frank Perkins Road Treatment Facility shutdowns occurred in June.

- 0449 on 22 June 2022 due to a power interruption and was restarted at 0815 on 22 June 2022.

The Base Boundary MTU continues to operate at a flow rate of 65 gpm. As of 24 June 2022, over 335.8 million gallons of water were treated and re-injected. No Base Boundary MTU shutdowns occurred in June.

The Leading Edge system continues to operate at a flow rate of 100 gpm. As of 24 June 2022, over 306.4 million gallons of water were treated and re-injected. No Leading Edge system shutdowns occurred in June.

The Pew Road Mobile Treatment Unit (MTU) was turned off with regulatory approval on 8 March 2021 (formerly operated at a flow rate of 65 GPM). Over 672.9 million gallons of water were treated and re-injected during the RA.

J-2 Range Groundwater RA

Northern Plant

The J-2 Range Northern Treatment facility consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The Extraction, Treatment, and Re-infiltration system includes three extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and an infiltration basin to return treated water to the aquifer.

The Northern MTUs E and F continue to operate at a flow rate of 250 gpm. As of 24 June 2022, over 1.967 billion gallons of water have been treated and re-injected. No MTU E and F shutdowns occurred in June.

The Northern Treatment Building G continues to operate at a flow rate of 225 gpm. As of 24 June 2022, over 1.491 billion gallons of water have been treated and re-injected. No Northern MTU G shutdowns occurred in June.

Eastern Plant

The J-2 Range Eastern Treatment facility consists of removal and treatment of groundwater to minimize downgradient migration of explosives compounds and perchlorate. The ETI system includes the following components: three extraction wells in an axial array, an ex-situ treatment process consisting of an ion exchange (IX) resin and granular activated carbon (GAC) media to treat perchlorate and explosives compounds, and three infiltration trenches located along the lateral boundaries of the plume where treated water enters the vadose zone and infiltrates into the aquifer. The J-2 Range Eastern system is running at a combined total flow rate of 495 gpm.

The MTUs H and I continue to operate at a flow rate of 250 gpm. As of 24 June 2022, over 1.607 billion gallons of water have been treated and re-injected. The following MTU H and I shutdowns occurred in June.

- 1215 on 14 June 2022 due to blown fuses on two separate power poles. Eversource was contacted to replace the fuses and MTUs were restarted at 0822 on 15 June 2022.

MTU J continues to operate at a flow rate of 120 gpm. As of 24 June 2022, over 749.7 million gallons of water have been treated and re-injected. The following MTU J shutdowns occurred in June.

- 1215 on 14 June 2022 due to blown fuses on two separate power poles. Eversource was contacted to replace the fuses and MTU J was restarted at 1125 on 15 June 2022.

MTU K continues to operate at a flow rate of 125 gpm. As of 24 June 2022, over 872.1 million gallons of water have been treated and re-injected. The following MTU K shutdowns occurred in June.

- 1215 on 14 June 2022 due to blown fuses on two separate power poles. Eversource was contacted to replace the fuses and MTU J was restarted at 0846 on 15 June 2022.

J-3 Range Groundwater RA

The J-3 Range Groundwater RA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The ETR system includes four extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater and utilizes the existing Fuel Spill-12 (FS-12) infiltration gallery to return treated water to the aquifer.

The J-3 system is currently operating at a flow rate of 255 gpm. As of 24 June 2022, over 1.617 billion gallons of water have been treated and re-injected. The following J-3 Range system shutdowns occurred in June.

- EW-IP2 shut down at 1300 on 25 April 2022 due to a failing pump and motor. A new pump and motor were installed on 3 June 2022. EW-IP2 was restarted at 1040 on 3 June 2022.

J-1 Range Groundwater RA

Southern Plant

The J-1 Range Southern Groundwater RA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds. The ETR system includes two extraction wells, an ex-situ treatment process to remove explosives compounds from the groundwater, and an infiltration trench to return treated water to the aquifer.

The Southern MTU continues to operate at a flow rate of 125 gpm. As of 24 June 2022, over 728.1 million gallons of water have been treated and re-injected. The following J-1 Range Southern system shutdowns occurred in June.

- 1215 on 14 June 2022 due to blown fuses on two separate power poles. Eversource was contacted to replace the fuses and MTU was restarted at 1231 on 15 June 2022.

Northern Plant

The J-1 Range Northern Groundwater RA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The ETR system includes two extraction wells, an ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and an infiltration trench to return treated water to the aquifer.

The Northern MTU continues to operate at a total system flow rate of 250 gpm. As of 24 June 2022, over 1.107 billion gallons of water have been treated and re-injected. No J-1 Range Northern MTU shutdowns occurred in June.

Central Impact Area RA

The Central Impact Area (CIA) Groundwater treatment facility consists of removal and treatment of groundwater to minimize downgradient migration of explosives compounds and perchlorate. The ETR system includes the following components: three extraction wells, an ex-situ treatment process consisting of an ion exchange resin and granular activated carbon media to treat explosives compounds, and three infiltration galleries to return treated water to the aquifer. The CIA systems 1, 2, and 3 continue to run at a combined total flow rate of 750 gpm. As of 24 June 2022, over 2.881 billion gallons of water have been treated and re-injected. The following CIA system shutdowns occurred in June.

- 0449 on 22 June 2022 due to a power interruption and was restarted at 0800 on 22 June 2022.

2. SUMMARY OF ACTIONS TAKEN

Operable Unit (OU) Activity as of 24 June 2022:

CIA

- Completed QC & QA Seeding

- CSS demolition operations
- Performed DGM surveys
- Intrusive investigations
- Cued data collection
- MM setup and testing
- Routine processing of MD
- Routine check of CSS cover

Demolition Area 1
- Groundwater sampling within Demo 1 SPM

Demolition Area 2
- No activity

J-1 Range
- Groundwater sampling within J-1 Northern SPM

J-2 Range
- No activity

J-3 Range
- No activity

L Range
- No activity

Small Arms Ranges
- No activity

Northwest Corner
- Groundwater sampling within NWC SPM (residential well)

Training Areas
- Inspected staged soil at H Range

Impact Area Roads
- No activity

Other
- Collected process water samples from Central Impact Area, Demolition Area 1, J-1 Range Northern, J-1 Range Southern, J-2 Range Eastern, J-2 Range Northern, and J-3 Range treatment systems

JBCC Impact Area Groundwater Study Program (IAGWSP) Tech Update Meeting Minutes for 30 June 2022

Project and Fieldwork Update

The groundwater sampling crews completed the Demolition Area 1 system performance monitoring (SPM) wells on June 28 and moved on to J-1 Northern long-term monitoring (LTM) wells. After that, they will move to perform the J-3 Range hydraulic event, the L Range LTM and J-3 SPM. All groundwater treatment systems are currently operating at normal flow rates. After replacement of the well pump and motor at J3 EW-IP2 (which was down since 4/25/22), it went back online on 6/3/22 (a camera inspection showed the well did not need to be redeveloped), and the system is now running at 255 gallons per minute. Monthly process water samples were collected from the treatment systems between 6/1 – 6/9/22. Waiting for approval of the updated ESS for offsite disposal of the ~50 CY of soil staged at H Range. Once everyone has signed off on it, disposal will be scheduled.

In the CIA, Weston has four to five UXO teams working: one performing demolition operations, one working on munitions debris/scrap and two to three teams performing intrusive work. There are two Metal Mappers working, SU-11 is 50% complete and work in SU-9 has just begun. The CSS material will be sampled today if materials arrive on time, if not, it will be performed next week.

Action Items

The action items were discussed and updated.

J-2 and J-3 Range Revised Draft Workplan for PFAS

Discussion was held on the status of the revised draft PFAS workplans provided May 31. EPA suggested the profiling for PFAS analyses is different and therefore more robust information as it pertains to the QAPP is required. For the J-2 Range workplan, EPA noted that they could provide a partial approval to fast-track certain portions of it e.g., the drilling of the borings. USACE explained they could provide more detail to address the latest information on PFAS analyses processes and a QAPP addendum might be required. USACE said they will provide a response to the preliminary comments to include details on sampling protocols and procedures. For the J-3 Range, EPA will review their preliminary submittal to determine if it is necessary to provide any additional comments. EPA noted that Region 1 managers and risk assessors had a meeting to discuss the preliminary lifetime health advisory (LHA) that was recently announced by EPA Headquarters. They explained that for the time being, EPA Region 1 is supporting the use of the Regional Screening Levels because the LHAs are preliminary and the technology to analyze to that low level is not available.

Central Impact Area 100% Verification Grid Presentation

A presentation was provided on the results of the CIA 100% dig validation in grid 48_35. A figure showing the validation grid was displayed and discussed. The group was reminded of the goals set in the Decision Document (remove 75-95% of UXO while maximizing removal of net explosive weight) as well as the goals of the classification (to correctly classify 95% of the targets of interest (TOI) while reducing clutter digs by greater than 70%).

A figure showing the Metal Mapper data collected for all EM61 anomalies for the grid was displayed. There were 946 EM61 anomaly locations with Metal Mapper cued data collection. Of those, there were 220 dig locations: two EM61 targets produced two digs. This resulted in a recommended dig rate of 23.26%.

The remaining 728 anomalies were dug for QA. Fourteen digs produced TOI or seeds: 9 TOI were recovered, and 5 seeds were detected. For the classification results, 728 clutter items were correctly classified, 22.1% of the clutter was incorrectly classified as "likely- TOI" therefore meeting the goal of reduction of clutter digs by 70%. For the clutter results, 22.1% was incorrectly classified as likely-TOI (206 digs that could have been safely left in the ground), which meets the goal of reduction of clutter digs by 70%. Large pieces of frag and/or large quantities of frag were classified as digs in some cases due to limitations of inversion algorithms.

The status and path forward were reviewed. The intrusive investigations for all 2021 Priority 1 areas are complete. Intrusive investigations are ongoing for 2021 Priority 2 areas. To date, in Survey Unit (SU) 3-2: 1689 TOIs complete with 1222 TOIs and 18 polygons remaining, in SU4: TOIs complete (1772) and 5 polygons remaining, and in SU3-2 and SU4, intrusive work will be completed in July 2022. Surface clearance, vegetation removal, and dynamic (EM-61) surveys have been completed for all 2022 SUs. AGC cued (MM2x2) surveys for all 2022 SUs began on 6/16/2022 and intrusive investigation of 2022 SUs will begin late July.

Consolidated Shot Structure (CSS) demolition operations are ongoing. As of 6/22/2022, 256 CDC bunker items and 320 MEC/MPPEH items from 2021 Priority 1 & 2 areas were disposed. Blow-in-Place (BIP) demolition operations will resume on July 6, 2022. As of 6/22/2022, 9 BIP items (including 1 Parson's BIP) were disposed of. There are 24 BIP items remaining from 2021 Priority 1 & 2 areas. During 2022 SUs, 2 BIP items have been discovered (surface clearance). The responses to EPA and MassDEP comments on the Annual Report were submitted on 6/15/2022. A draft 2022 QAPP update is expected to be submitted for regulatory review in early July. A status map as of 22 June 2022 was displayed.

JBCC Cleanup Team Meeting

The next JBCC Cleanup Team (JBCCCT) is scheduled for 3 August 2022 and will be held virtually. Meeting details and presentation materials from previous meetings can be found on the IAGWSP web site at http://jbcc-iagwsp.org/community/impact/presentations/. The Cleanup Team meeting discusses late breaking news and responses to action items, as well as updates from the IAGWSP and the Installation Restoration Program (IRP). The JBCCCT meetings provide a forum for community input regarding issues related to both the IRP and the IAGWSP.

3. SUMMARY OF DATA RECEIVED

Table 1 summarizes sampling for all media from 1 to 30 June 2022. Table 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 1 to 30 June 2022. These results are compared to the Maximum Contaminant Levels/Health Advisory (MCL/HA) values for respective analytes. Explosives and perchlorate are the primary contaminants of concern (COC) at Camp Edwards. Table 3 summarizes sampling of influent and groundwater samples for per- and polyfluoroalkyl substances (PFAS) from 1 January 2022 to present.

The operable units (OUs) under investigation and cleanup at Camp Edwards are the Central Impact Area, Demolition Area 1, Demolition Area 2, J-1 Range, J-2 Range, J-3 Range, L Range, Northwest Corner, Small Arms Ranges, and Training Areas. Environmental monitoring reports for each OU are generated each year to evaluate the current year groundwater results. These reports are available on the site Environmental Data Management System (EDMS) and at the project document repositories (IAGWSP office and Jonathan Bourne Library).

4. SUBMITTED DELIVERABLES

Deliverables submitted during the reporting period include the following:

• Monthly Progress Report No. 302 for May 2022	10 June 2022
• Response to Comments on the Draft J-3 Range 2021 Environmental Monitoring Report	8 June 2022
• Response to Comments on the Draft L Range 2022 Environmental Monitoring Report	8 June 2022
• Response to Comments on the Draft Technical Memorandum: J-2 Range Eastern Perchlorate and RDX Plume Shell Development	8 June 2022
• Response to Comments on the Draft Technical Memorandum: J-2 Range Northern Perchlorate Plume Shell Development	8 June 2022
• Draft Final 2021 Source Removal Annual Report	15 June 2022
• Response to Comments on the Draft Small Arms Ranges 2022 Environmental Monitoring Report	28 June 2022

5. SCHEDULED ACTIONS

The following actions and/or documents are being prepared in July 2022.

- L Range 2022 Annual Environmental Monitoring Report
- Small Arms Ranges 2022 Annual Environmental Monitoring Report
- J-2 Range Northern 2022 Annual Environmental Monitoring Report
- Response to Comments on the J-3 Range Work Plan for PFAS Sampling
- Response to Comments on the J-2 Northern Range Work Plan for PFAS Sampling
- Central Impact Area Source Area Removal Report
- J-3 Range 2021 Annual Environmental Monitoring Report
- J-2 Eastern Plume Shell Development Technical Memorandum
- J-2 Northern Plume Shell Development Technical Memorandum
- Small Arms Ranges Final Soil Removal Activities Completion of Work Report
- J-2 Range, Phase-2, Addendum to the Post-DD Confirmation Geophysical and Soil Investigation Findings Revised Technical Memorandum
- KD Range Technical Memorandum
- Five Year Review Report
- Demolition Area 2 2022 Annual Environmental Monitoring Report

TABLE 1
Sampling Progress: 1 to 30 June 2022

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J1 Range Northern	MW-549M2	MW-549M2_S22	N	06/29/2022	Ground Water	187.3	197.3
J1 Range Northern	MW-549M1	MW-549M1_S22	N	06/29/2022	Ground Water	227.4	237.4
J1 Range Northern	MW-567M1	MW-567M1_S22	N	06/29/2022	Ground Water	215.5	225.5
J1 Range Northern	MW-605M2	MW-605M2_S22	MS	06/29/2022	Ground Water	182.2	192.2
J1 Range Northern	MW-605M2	MW-605M2_S22	N	06/29/2022	Ground Water	182.2	192.2
J1 Range Northern	MW-605M2	MW-605M2_S22	SD	06/29/2022	Ground Water	182.2	192.2
J1 Range Northern	MW-605M1	MW-605M1_S22	N	06/29/2022	Ground Water	220.2	230.2
J1 Range Northern	MW-566M1	MW-566M1_S22	N	06/28/2022	Ground Water	232	242
J1 Range Northern	MW-547M2	MW-547M2_S22	N	06/28/2022	Ground Water	178	188
J1 Range Northern	MW-547M2	MW-547M2_S22D	FD	06/28/2022	Ground Water	178	188
J1 Range Northern	MW-547M1	MW-547M1_S22	N	06/28/2022	Ground Water	237	247
Demolition Area 1	MW-610M2	MW-610M2_S22	N	06/28/2022	Ground Water	85	95
Demolition Area 1	MW-610M1	MW-610M1_S22	N	06/28/2022	Ground Water	110	120
Demolition Area 1	MW-611M2	MW-611M2_S22	N	06/27/2022	Ground Water	91	101
Demolition Area 1	MW-611M1	MW-611M1_S22	N	06/27/2022	Ground Water	141	151
Demolition Area 1	MW-611M1	MW-611M1_S22D	FD	06/27/2022	Ground Water	141	151
Demolition Area 1	EW-658	EW-658_S22	N	06/27/2022	Process Water	96	136
Demolition Area 1	MW-431	MW-431_S22	N	06/27/2022	Process Water	88	180
Northwest Corner	RSNW06	RSNW06_S22	N	06/23/2022	Ground Water	0	0
Demolition Area 1	MW-641M2	MW-641M2_S22	N	06/23/2022	Ground Water	86.2	96.2
Demolition Area 1	MW-641M1	MW-641M1_S22	N	06/23/2022	Ground Water	113.2	123.2
Demolition Area 1	MW-642M2	MW-642M2_S22	N	06/23/2022	Ground Water	77.3	87.3
Demolition Area 1	MW-642M1	MW-642M1_S22	N	06/23/2022	Ground Water	104.3	114.3
Demolition Area 1	MW-648M1	MW-648M1_S22	N	06/22/2022	Ground Water	112	122
Demolition Area 1	MW-76S	MW-76S_S22	N	06/22/2022	Ground Water	85	95
Demolition Area 1	MW-76M2	MW-76M2_S22	N	06/22/2022	Ground Water	105	115
Demolition Area 1	MW-76M1	MW-76M1_S22	MS	06/22/2022	Ground Water	125	135
Demolition Area 1	MW-76M1	MW-76M1_S22	N	06/22/2022	Ground Water	125	135
Demolition Area 1	MW-76M1	MW-76M1_S22	SD	06/22/2022	Ground Water	125	135
Demolition Area 1	MW-210M2	MW-210M2_S22	N	06/22/2022	Ground Water	156	166
Demolition Area 1	MW-210M1	MW-210M1_S22	N	06/22/2022	Ground Water	201	211
Demolition Area 1	MW-556M2	MW-556M2_S22	N	06/21/2022	Ground Water	111	121
Demolition Area 1	MW-556M1	MW-556M1_S22	N	06/21/2022	Ground Water	153	163
Demolition Area 1	MW-558M2	MW-558M2_S22	N	06/21/2022	Ground Water	98	108
Demolition Area 1	MW-558M1	MW-558M1_S22	N	06/21/2022	Ground Water	134	144
Demolition Area 1	MW-559M2	MW-559M2_S22	N	06/21/2022	Ground Water	87	97
Demolition Area 1	MW-559M1	MW-559M1_S22	N	06/21/2022	Ground Water	135.6	145.6
Demolition Area 1	MW-659M2	MW-659M2_S22	N	06/20/2022	Ground Water	85	95
Demolition Area 1	MW-659M1	MW-659M1_S22	MS	06/20/2022	Ground Water	120	130
Demolition Area 1	MW-659M1	MW-659M1_S22	N	06/20/2022	Ground Water	120	130
Demolition Area 1	MW-659M1	MW-659M1_S22	SD	06/20/2022	Ground Water	120	130
Demolition Area 1	MW-571M2	MW-571M2_S22	N	06/20/2022	Ground Water	74	84
Demolition Area 1	MW-571M1	MW-571M1_S22	N	06/20/2022	Ground Water	114	124
Demolition Area 1	MW-569M2	MW-569M2_S22	N	06/20/2022	Ground Water	84	94
Demolition Area 1	MW-569M1	MW-569M1_S22	N	06/20/2022	Ground Water	114	124
Demolition Area 1	MW-352M1	MW-352M1_S22	N	06/16/2022	Ground Water	115	125
Demolition Area 1	MW-353M2	MW-353M2_S22	N	06/16/2022	Ground Water	57	67
Demolition Area 1	MW-353M1	MW-353M1_S22	N	06/16/2022	Ground Water	107	117
Demolition Area 1	MW-597M2	MW-597M2_S22	N	06/16/2022	Ground Water	118	128
Demolition Area 1	MW-597M1	MW-597M1_S22	N	06/16/2022	Ground Water	148	158
Demolition Area 1	MW-173M2	MW-173M2_S22	N	06/15/2022	Ground Water	208	218
Demolition Area 1	MW-173M1	MW-173M1_S22	N	06/15/2022	Ground Water	243	253
Demolition Area 1	MW-78M2	MW-78M2_S22	N	06/15/2022	Ground Water	115	125
Demolition Area 1	MW-78M1	MW-78M1_S22	N	06/15/2022	Ground Water	135	145
Demolition Area 1	MW-165M2	MW-165M2_S22	N	06/14/2022	Ground Water	124.5	134.5
Demolition Area 1	MW-165M1	MW-165M1_S22	N	06/14/2022	Ground Water	184.5	194.5

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 to 30 June 2022

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
Demolition Area 1	MW-274	MW-274_S22	N	06/14/2022	Process Water	109	199
Demolition Area 1	XX9514	XX9514_S22	N	06/14/2022	Ground Water	0	0
Demolition Area 1	XX9514	XX9514_S22D	FD	06/14/2022	Ground Water	0	0
Demolition Area 1	MW-75M2	MW-75M2_S22	N	06/13/2022	Ground Water	115	125
Demolition Area 1	MW-75M1	MW-75M1_S22	N	06/13/2022	Ground Water	140	150
Demolition Area 1	MW-77S	MW-77S_S22	N	06/13/2022	Ground Water	83	93
Demolition Area 1	MW-77M2	MW-77M2_S22	N	06/13/2022	Ground Water	120	130
Demolition Area 1	MW-77M2	MW-77M2_S22D	FD	06/13/2022	Ground Water	120	130
Demolition Area 1	MW-77M1	MW-77M1_S22	N	06/13/2022	Ground Water	180	190
Demolition Area 1	MW-129M3	MW-129M3_S22	MS	06/09/2022	Ground Water	96	106
Demolition Area 1	MW-129M3	MW-129M3_S22	N	06/09/2022	Ground Water	96	106
Demolition Area 1	MW-129M3	MW-129M3_S22	SD	06/09/2022	Ground Water	96	106
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-195A	N	06/09/2022	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-195A	N	06/09/2022	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-195A	N	06/09/2022	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-195A	N	06/09/2022	Process Water	0	0
Demolition Area 1	MW-129M2	MW-129M2_S22	N	06/09/2022	Ground Water	116	126
Demolition Area 1	D1LE-EFF	D1LE-EFF-71A	N	06/09/2022	Process Water	0	0
Demolition Area 1	MW-129M1	MW-129M1_S22	N	06/09/2022	Ground Water	136	146
Demolition Area 1	D1LE-MID2	D1LE-MID2-71A	N	06/09/2022	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-71A	N	06/09/2022	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-71A	N	06/09/2022	Process Water	0	0
Demolition Area 1	MW-114M2	MW-114M2_S22	N	06/09/2022	Ground Water	120	130
Demolition Area 1	D1-EFF	D1-EFF-143A	N	06/09/2022	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-143A	N	06/09/2022	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-143A	N	06/09/2022	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-143A	N	06/09/2022	Process Water	0	0
Demolition Area 1	MW-114M1	MW-114M1_S22	N	06/09/2022	Ground Water	177	187
Demolition Area 1	MW-19S	MW-19S_S22	N	06/08/2022	Ground Water	38	48
Demolition Area 1	MW-19S	MW-19S_S22D	FD	06/08/2022	Ground Water	38	48
Demolition Area 1	MW-73S	MW-73S_S22	N	06/08/2022	Ground Water	38.5	48
Demolition Area 1	MW-73S	MW-73S_S22D	FD	06/08/2022	Ground Water	38.5	48
Demolition Area 1	MW-31S	MW-31S_S22	N	06/08/2022	Ground Water	98	103
Demolition Area 1	MW-31S	MW-31S_S22D	FD	06/08/2022	Ground Water	98	103
Demolition Area 1	MW-31M	MW-31M_S22	N	06/08/2022	Ground Water	113	123
Demolition Area 1	MW-31D	MW-31D_S22	N	06/08/2022	Ground Water	133	138
J3 Range	J3-EFF	J3-EFF-189A	N	06/07/2022	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-189A	N	06/07/2022	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-189A	N	06/07/2022	Process Water	0	0
J3 Range	J3-INF	J3-INF-189A	N	06/07/2022	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-72A	N	06/07/2022	Process Water	0	0
J1 Range Southern	J1S-EFF	J1S-EFF-175A	N	06/07/2022	Process Water	0	0
J1 Range Southern	J1S-MID	J1S-MID-175A	N	06/07/2022	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-175A	N	06/07/2022	Process Water	0	0
Central Impact Area	CIA1-EFF	CIA1-EFF-101A	N	06/07/2022	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-101A	N	06/07/2022	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-101A	N	06/07/2022	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-101A	N	06/07/2022	Process Water	0	0
Demolition Area 1	MW-543M2	MW-543M2_S22	N	06/06/2022	Ground Water	91.8	101.8
Demolition Area 1	MW-543M1	MW-543M1_S22	N	06/06/2022	Ground Water	127	137
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-189A	N	06/06/2022	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-189A	N	06/06/2022	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-189A	N	06/06/2022	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-189A	N	06/06/2022	Process Water	0	0
Demolition Area 1	MW-545M4	MW-545M4_S22	N	06/06/2022	Ground Water	72	82
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-189A	N	06/06/2022	Process Water	0	0

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 to 30 June 2022

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-189A	N	06/06/2022	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-189A	N	06/06/2022	Process Water	0	0
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-189A	N	06/06/2022	Process Water	0	0
Demolition Area 1	MW-545M3	MW-545M3_S22	N	06/06/2022	Ground Water	101.5	111.5
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-189A	N	06/06/2022	Process Water	0	0
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-189A	N	06/06/2022	Process Water	0	0
Demolition Area 1	MW-545M2	MW-545M2_S22	N	06/06/2022	Ground Water	142	152
J1 Range Northern	J1N-EFF	J1N-EFF-104A	N	06/06/2022	Process Water	0	0
J1 Range Northern	J1N-MID2	J1N-MID2-104A	N	06/06/2022	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-104A	N	06/06/2022	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-104A	N	06/06/2022	Process Water	0	0
Demolition Area 1	MW-545M1	MW-545M1_S22	N	06/06/2022	Ground Water	162	172
Central Impact Area	CIA2-EFF	CIA2-EFF-101A	N	06/02/2022	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-101A	N	06/02/2022	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-101A	N	06/02/2022	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-101A	N	06/02/2022	Process Water	0	0
Demolition Area 1	MW-211M2	MW-211M2_S22	N	06/02/2022	Ground Water	175	185
Demolition Area 1	MW-211M1	MW-211M1_S22	N	06/02/2022	Ground Water	200	210
Demolition Area 1	MW-663D	MW-663D_S22	N	06/02/2022	Ground Water	240.6	250.6
Demolition Area 1	MW-663D	MW-663D_S22D	FD	06/02/2022	Ground Water	240.6	250.6
Demolition Area 1	MW-664M2	MW-664M2_S22	MS	06/02/2022	Ground Water	218.5	228.5
Demolition Area 1	MW-664M2	MW-664M2_S22	N	06/02/2022	Ground Water	218.5	228.5
Demolition Area 1	MW-664M2	MW-664M2_S22	SD	06/02/2022	Ground Water	218.5	228.5
Central Impact Area	CIA3-EFF	CIA3-EFF-72A	N	06/02/2022	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-72A	N	06/02/2022	Process Water	0	0
Demolition Area 1	MW-664M1	MW-664M1_S22	N	06/02/2022	Ground Water	248.5	258.5
Central Impact Area	CIA3-MID1	CIA3-MID1-72A	N	06/02/2022	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-72A	N	06/02/2022	Process Water	0	0
Demolition Area 1	MW-546M2	MW-546M2_S22	N	06/01/2022	Ground Water	100	110
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-165A	N	06/01/2022	Process Water	0	0
Demolition Area 1	MW-546M1	MW-546M1_S22	N	06/01/2022	Ground Water	140	150
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-INF-J	J2E-INF-J-165A	N	06/01/2022	Process Water	0	0
Demolition Area 1	MW-544M3	MW-544M3_S22	N	06/01/2022	Ground Water	77.5	87.5
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-165A	N	06/01/2022	Process Water	0	0
Demolition Area 1	MW-544M2	MW-544M2_S22	N	06/01/2022	Ground Water	112	122
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-165A	N	06/01/2022	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-165A	N	06/01/2022	Process Water	0	0
Demolition Area 1	MW-544M1	MW-544M1_S22	N	06/01/2022	Ground Water	162	172
Demolition Area 1	MW-544M1	MW-544M1_S22D	FD	06/01/2022	Ground Water	162	172

N = Normal Sample
FD = Field Duplicate

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received June 2022

Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
Demolition Area 2	MW-259M1	MW-259M1_S22	189	199	05/16/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.043	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-262M1	MW-262M1_S22	226	236	05/16/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.17	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-16S	MW-16S_S22	125	135	05/16/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.041	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-161S	MW-161S_S22	145.5	155.5	05/12/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.14	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-161S	MW-161S_S22D	145.5	155.5	05/12/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.13	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-380M2	MW-380M2_S22	205.66	215.66	05/12/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.037	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-404M2	MW-404M2_S22	200.04	210.04	05/11/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.19	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-573M2	MW-573M2_S22	155.4	165.4	05/11/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.17	J	µg/L	0.60		0.037	0.20
Demolition Area 2	MW-573M1	MW-573M1_S22	176.4	186.4	05/11/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.24		µg/L	0.60		0.037	0.20
J3 Range	MW-197M1	MW-197M1_S22	120	125	05/10/2022	SW6850	Perchlorate	0.091	J	µg/L	2.0		0.086	0.20
J1 Range Southern	MW-721M1	MW-721M1_S22	168.1	178.1	05/05/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.33		µg/L	0.60		0.037	0.20
J1 Range Southern	MW-669M2	MW-669M2_S22	201.7	211.7	05/04/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.043	J	µg/L	0.60		0.037	0.20
J1 Range Southern	MW-669M1	MW-669M1_S22	223.7	233.7	05/04/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.26	J	µg/L	0.60		0.037	0.20
J1 Range Southern	MW-669M1	MW-669M1_S22D	223.7	233.7	05/04/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.34	J	µg/L	0.60		0.037	0.20
J1 Range Southern	MW-647M1	MW-647M1_S22	211.3	221.3	05/03/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.082	J	µg/L	0.60		0.037	0.20
J1 Range Southern	MW-402M1	MW-402M1_S22	190.14	200.13	05/02/2022	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.096	J	µg/L	0.60		0.037	0.20

J = Estimated Result
MDL = Method Detection Limit
RL = Reporting Limit

MCL/HA= Either the MCL or Lowest Health Advisory Limit
July 8, 2022

All results from 1 January to 30 June 2022
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Joint Base Cape Cod, IAGWSP

KGS 2022 J2 North PFAS Spring - J2 Range Eastern

Location	MW-128S	MW-48D	MW-48M2	MW-48S	MW-49D	MW-49M1
Field Sample ID	MW-128S_S22	MW-48D_S22	MW-48M2_S22	MW-48S_S22	MW-49D_S22	MW-49M1_S22
Sampling Depth	87.00 - 97.00	221.00 - 231.00	161.00 - 171.00	99.00 - 109.00	185.00 - 195.00	160.00 - 170.00
Sampling Date	01/11/2022	01/04/2022	01/04/2022	01/05/2022	01/03/2022	01/03/2022
SDG	320838001	320836321	320836321	320837121	320836321	320836321
Sample Type	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
Perfluorobutanesulfonic acid	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
Perfluorobutanoic acid (PFBA)	0.480 U	0.470 U	0.490 U	0.500 U	0.500 U	0.480 U
Perfluorodecanesulfonic acid (PFDS)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluorodecanoic acid (PFDA)	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
Perfluorododecanoic acid (PFDoA)	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
Perfluoroheptanesulfonic acid (PFHpS)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	0.960 U	0.950 U	0.990 U	1.00 U	1.00 U	0.960 U
Perfluorohexane sulfonate (PFHxS)	**4.30**	0.950 U	0.990 U	**0.600 J**	1.00 U	0.960 U
Perfluorohexanoic acid (PFHxA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluorononanoic acid (PFNA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluorooctanesulfonamide (PFOSA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluorooctanesulfonic acid (PFOS)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluoropentanoic acid (PFPeA)	0.480 U	0.470 U	0.490 U	0.500 U	0.500 U	0.480 U
Perfluorotetradecanoic acid (PFTeDA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluorotridecanoic acid (PFTrDA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
Perfluoroundecanoic acid (PFUnA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U	1.40 U
†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**4.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
§Sum of All Compounds Detected	**4.30**	**0.00**	**0.00**	**0.600**	**0.00**	**0.00**

All results from 1 January to 30 June 2022
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Location	MW-49M2	MW-49M3	MW-49S
Field Sample ID	MW-49M2_S22	MW-49M3_S22	MW-49S_S22
Sampling Depth	130.00 - 140.00	100.50 - 110.50	68.50 - 78.00
Sampling Date	01/03/2022	01/03/2022	01/03/2022
SDG	320836321	320836321	320836321
Sample Type	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.980 U	0.960 U	0.960 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.50 U	1.40 U	1.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.980 U	0.960 U	0.960 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.980 U	0.960 U	0.960 U
Perfluorobutanesulfonic acid	0.980 U	0.960 U	0.960 U
Perfluorobutanoic acid (PFBA)	0.490 U	0.480 U	0.480 U
Perfluorodecanesulfonic acid (PFDS)	1.50 U	1.40 U	1.40 U
Perfluorodecanoic acid (PFDA)	0.980 U	0.960 U	0.960 U
Perfluorododecanoic acid (PFDoA)	0.980 U	0.960 U	0.960 U
Perfluoroheptanesulfonic acid (PFHpS)	1.50 U	1.40 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	0.980 U	0.960 U	0.960 U
Perfluorohexane sulfonate (PFHxS)	0.980 U	0.960 U	0.960 U
Perfluorohexanoic acid (PFHxA)	1.50 U	1.40 U	1.40 U
Perfluorononanoic acid (PFNA)	1.50 U	1.40 U	1.40 U
Perfluorooctanesulfonamide (PFOSA)	1.50 U	1.40 U	1.40 U
Perfluorooctanesulfonic acid (PFOS)	1.50 U	1.40 U	1.40 U
Perfluorooctanoic acid (PFOA)	1.50 U	1.40 U	1.40 U
Perfluoropentanoic acid (PFPeA)	0.490 U	0.480 U	0.480 U
Perfluorotetradecanoic acid (PFTeDA)	1.50 U	1.40 U	1.40 U
Perfluorotridecanoic acid (PFTrDA)	1.50 U	1.40 U	1.40 U
Perfluoroundecanoic acid (PFUnA)	1.50 U	1.40 U	1.40 U
†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**	**0.00**	**0.00**
§Sum of All Compounds Detected	**0.00**	**0.00**	**0.00**

All results from 1 January to 30 June 2022
PFAS Summary Report – Groundwater
Joint Base Cape Cod, IAGWSP

KGS 2022 J2 North PFAS Spring - J2 Range Northern

Location	C-4D	C-4D	C-4M	C-4S	C-7D	C-7M
Field Sample ID	C-4D_S22	C-4D_S22D	C-4M_S22	C-4S_S22	C-7D_S22	C-7M_S22
Sampling Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Sampling Date	01/13/2022	01/13/2022	01/13/2022	01/13/2022	01/12/2022	01/12/2022
SDG	320838831	320838831	320838831	320838831	320838831	320838831
Sample Type	**Normal**	**Field Duplicate**	**Normal**	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.960 U	0.950 U	0.920 U	0.950 U	0.930 U	0.950 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.960 U	0.950 U	0.920 U	0.950 U	0.930 U	0.950 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.960 U	0.950 U	0.920 U	0.950 U	0.930 U	0.950 U
Perfluorobutanesulfonic acid	0.960 U	0.950 U	0.920 U	0.950 U	0.930 U	0.950 U
Perfluorobutanoic acid (PFBA)	0.480 U	0.470 U	0.460 U	0.480 U	0.470 U	0.480 U
Perfluorodecanesulfonic acid (PFDS)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorodecanoic acid (PFDA)	**4.30**	**4.50**	**5.90**	**5.30**	**4.80**	**4.20**
Perfluorododecanoic acid (PFDoA)	**0.760 J**	**1.00 J**	**1.60 J**	**1.10 J**	**1.70 J**	**0.960 J**
Perfluoroheptanesulfonic acid (PFHpS)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	0.960 U	0.950 U	0.920 U	0.950 U	0.930 U	0.950 U
Perfluorohexane sulfonate (PFHxS)	0.960 U	0.950 U	0.920 U	0.950 U	0.930 U	0.950 U
Perfluorohexanoic acid (PFHxA)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorononanoic acid (PFNA)	**0.900 J**	**0.930 J**	**1.30 J**	**1.90**	1.40 U	1.40 U
Perfluorooctanesulfonamide (PFOSA)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanesulfonic acid (PFOS)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoropentanoic acid (PFPeA)	0.480 U	0.470 U	0.460 U	0.480 U	0.470 U	0.480 U
Perfluorotetradecanoic acid (PFTeDA)	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorotridecanoic acid (PFTrDA)	1.40 U	1.40 U	1.40 U	**0.970 J**	**0.940 J**	1.40 U
Perfluoroundecanoic acid (PFUnA)	**4.60**	**4.30**	**13.0**	**14.0**	**12.0**	**5.80**
†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**4.30**	**4.50**	**5.90**	**7.20**	**4.80**	**4.20**
§Sum of All Compounds Detected	**10.6**	**10.7**	**21.8**	**23.3**	**19.4**	**11.0**

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Location	C-7S	J2EW3-MW1-A	J2EW3-MW1-B	J2EW3-MW1-C	J2EW3-MW-2-A	J2EW3-MW-2-B
Field Sample ID	C-7S_S22	J2EW3-MW1-A_S22	J2EW3-MW1-B_S22	J2EW3-MW1-C_S22	J2EW3-MW-2-A_S22	J2EW3-MW-2-B_S22
Sampling Depth	0.00 - 0.00	145.66 - 155.66	210.66 - 220.66	245.66 - 255.66	151.16 - 161.16	216.16 - 226.16
Sampling Date	01/12/2022	01/05/2022	01/05/2022	01/05/2022	01/06/2022	01/06/2022
SDG	320838831	320837121	320837121	320837121	320836691	320836691
Sample Type	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.990 U	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.990 U	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.990 U	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
Perfluorobutanesulfonic acid	0.990 U	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
Perfluorobutanoic acid (PFBA)	0.490 U	0.490 U	0.490 U	0.460 U	0.500 U	0.510 U
Perfluorodecanesulfonic acid (PFDS)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluorodecanoic acid (PFDA)	**2.20**	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
Perfluorododecanoic acid (PFDoA)	**1.70 J**	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
Perfluoroheptanesulfonic acid (PFHpS)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluoroheptanoic acid (PFHpA)	0.990 U	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
Perfluorohexane sulfonate (PFHxS)	0.990 U	0.990 U	0.990 U	0.930 U	1.00 U	1.00 U
Perfluorohexanoic acid (PFHxA)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluorononanoic acid (PFNA)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluorooctanesulfonamide (PFOSA)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluorooctanesulfonic acid (PFOS)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluorooctanoic acid (PFOA)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluoropentanoic acid (PFPeA)	0.490 U	0.490 U	0.490 U	0.460 U	0.500 U	0.510 U
Perfluorotetradecanoic acid (PFTeDA)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluorotridecanoic acid (PFTrDA)	1.50 U	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
Perfluoroundecanoic acid (PFUnA)	**13.0**	1.50 U	1.50 U	1.40 U	1.50 U	1.50 U
†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**2.20**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
§Sum of All Compounds Detected	**16.9**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	Location	J2EW3-MW-2-C	J2N-EFF-E	J2N-EFF-F	J2N-EFF-G	MW-293M1	MW-296M1
	Field Sample ID	J2EW3-MW-2-C_S22	J2N-EFF-E_S22	J2N-EFF-F_S22	J2N-EFF-G_S22	MW-293M1_S22	MW-296M1_S22
	Sampling Depth	251.13 - 261.13	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	255.08 - 265.08
	Sampling Date	01/06/2022	01/10/2022	01/10/2022	01/10/2022	01/11/2022	01/10/2022
	SDG	320836691	320838001	320838001	320838001	320838001	320838001
	Sample Type	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps		Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)		0.950 U	0.970 U	**1.20 J**	0.950 U	0.960 U	0.940 U
8:2 Fluorotelomer sulfonate (8:2 FTS)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)		0.950 U	0.970 U	0.960 U	0.950 U	0.960 U	0.940 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)		0.950 U	0.970 U	0.960 U	0.950 U	**0.590 J**	0.940 U
Perfluorobutanesulfonic acid		**1.30 J**	0.970 U	0.960 U	0.950 U	0.960 U	0.940 U
Perfluorobutanoic acid (PFBA)		**0.380 J**	0.490 U	**0.250 J**	**0.290 J**	0.480 U	**0.310 J**
Perfluorodecanesulfonic acid (PFDS)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorodecanoic acid (PFDA)		0.950 U	0.970 U	0.960 U	0.950 U	**14.0**	0.940 U
Perfluorododecanoic acid (PFDoA)		0.950 U	0.970 U	0.960 U	0.950 U	**1.30 J**	**0.780 J**
Perfluoroheptanesulfonic acid (PFHpS)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoroheptanoic acid (PFHpA)		0.950 U	0.970 U	0.960 U	0.950 U	0.960 U	0.940 U
Perfluorohexane sulfonate (PFHxS)		**1.20 J**	0.970 U	0.960 U	0.950 U	0.960 U	0.940 U
Perfluorohexanoic acid (PFHxA)		**1.70 J**	1.50 U	**1.00 J**	**1.60 J**	1.40 U	1.40 U
Perfluorononanoic acid (PFNA)		1.40 U	1.50 U	1.40 U	1.40 U	**20.0**	**0.570 J**
Perfluorooctanesulfonamide (PFOSA)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanesulfonic acid (PFOS)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanoic acid (PFOA)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoropentanoic acid (PFPeA)		**0.900 J**	0.490 U	**0.620 J**	**0.510 J**	0.480 U	0.470 U
Perfluorotetradecanoic acid (PFTeDA)		1.40 U	1.50 U	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorotridecanoic acid (PFTrDA)		1.40 U	1.50 U	1.40 U	1.40 U	**0.990 J**	1.40 U
Perfluoroundecanoic acid (PFUnA)		1.40 U	1.50 U	1.40 U	1.40 U	**15.0**	**3.20**
	†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
	‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**	**0.00**	**0.00**	**0.00**	**34.0**	**0.00**
	§Sum of All Compounds Detected	**5.48**	**0.00**	**3.07**	**2.40**	**51.9**	**4.86**

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Location	MW-296M2	MW-48M1	MW-48M3
Field Sample ID	MW-296M2_S22	MW-48M1_S22	MW-48M3_S22
Sampling Depth	214.98 - 224.98	191.00 - 201.00	131.50 - 142.00
Sampling Date	01/10/2022	01/04/2022	01/04/2022
SDG	320838001	320836321	320836321
Sample Type	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.930 U	0.980 U	0.990 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.40 U	1.50 U	1.50 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.930 U	0.980 U	0.990 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.930 U	0.980 U	0.990 U
Perfluorobutanesulfonic acid	0.930 U	0.980 U	0.990 U
Perfluorobutanoic acid (PFBA)	0.460 U	0.490 U	0.490 U
Perfluorodecanesulfonic acid (PFDS)	1.40 U	1.50 U	1.50 U
Perfluorodecanoic acid (PFDA)	**1.20 J**	0.980 U	0.990 U
Perfluorododecanoic acid (PFDoA)	**0.490 J**	0.980 U	0.990 U
Perfluoroheptanesulfonic acid (PFHpS)	1.40 U	1.50 U	1.50 U
Perfluoroheptanoic acid (PFHpA)	0.930 U	0.980 U	0.990 U
Perfluorohexane sulfonate (PFHxS)	0.930 U	0.980 U	0.990 U
Perfluorohexanoic acid (PFHxA)	1.40 U	1.50 U	1.50 U
Perfluorononanoic acid (PFNA)	**1.10 J**	1.50 U	1.50 U
Perfluorooctanesulfonamide (PFOSA)	1.40 U	1.50 U	1.50 U
Perfluorooctanesulfonic acid (PFOS)	1.40 U	1.50 U	1.50 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.50 U	1.50 U
Perfluoropentanoic acid (PFPeA)	0.460 U	0.490 U	0.490 U
Perfluorotetradecanoic acid (PFTeDA)	1.40 U	1.50 U	1.50 U
Perfluorotridecanoic acid (PFTrDA)	1.40 U	1.50 U	1.50 U
Perfluoroundecanoic acid (PFUnA)	**1.20 J**	1.50 U	1.50 U
†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**	**0.00**	**0.00**
§Sum of All Compounds Detected	**3.99**	**0.00**	**0.00**

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KGS 2022 J2 North PFAS Spring - Lima Range

Location	MW-236S
Field Sample ID	MW-236S_S22
Sampling Depth	96.00 - 106.00
Sampling Date	01/11/2022
SDG	320838001
Sample Type	**Normal**
PFAS 21 Cmps	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.960 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.960 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.960 U
Perfluorobutanesulfonic acid	0.960 U
Perfluorobutanoic acid (PFBA)	**1.50 J**
Perfluorodecanesulfonic acid (PFDS)	1.40 U
Perfluorodecanoic acid (PFDA)	0.960 U
Perfluorododecanoic acid (PFDoA)	0.960 U
Perfluoroheptanesulfonic acid (PFHpS)	1.40 U
Perfluoroheptanoic acid (PFHpA)	**1.20 J**
Perfluorohexane sulfonate (PFHxS)	0.960 U
Perfluorohexanoic acid (PFHxA)	**1.20 J**
Perfluorononanoic acid (PFNA)	1.40 U
Perfluorooctanesulfonamide (PFOSA)	1.40 U
Perfluorooctanesulfonic acid (PFOS)	**2.30**
Perfluorooctanoic acid (PFOA)	**1.30 J**
Perfluoropentanoic acid (PFPeA)	**0.640 J**
Perfluorotetradecanoic acid (PFTeDA)	1.40 U
Perfluorotridecanoic acid (PFTrDA)	1.40 U
Perfluoroundecanoic acid (PFUnA)	1.40 U
†PFOS + PFOA (EPA)	**3.60**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**2.30**
§Sum of All Compounds Detected	**8.14**

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KGS 2022 J3 Range SPM Spring - J3 Range

Location	J3-EFF	J3-EFF	J3-INF	J3-INF
Field Sample ID	J3-EFF_1Q22	J3-EFF_2Q22	J3-INF_1Q22	J3-INF_2Q22
Sampling Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Sampling Date	01/24/2022	04/28/2022	01/24/2022	04/28/2022
SDG	320842111	320873411	320842111	320873411
Sample Type	**Normal**	**Normal**	**Normal**	**Normal**
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	0.940 U	0.960 U	0.950 U	0.960 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	1.40 U	1.40 U	1.40 U	1.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.940 U	0.960 U	0.950 U	0.960 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.940 U	0.960 U	0.950 U	0.960 U
Perfluorobutanesulfonic acid	0.940 U	0.960 U	0.950 U	0.960 U
Perfluorobutanoic acid (PFBA)	**0.240 J**	0.480 U	**0.250 J**	0.480 U
Perfluorodecanesulfonic acid (PFDS)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorodecanoic acid (PFDA)	0.940 U	0.960 U	0.950 U	0.960 U
Perfluorododecanoic acid (PFDoA)	0.940 U	0.960 U	0.950 U	0.960 U
Perfluoroheptanesulfonic acid (PFHpS)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	0.940 U	0.960 U	0.950 U	0.960 U
Perfluorohexane sulfonate (PFHxS)	0.940 U	0.960 U	**1.10 J**	**0.480 J**
Perfluorohexanoic acid (PFHxA)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorononanoic acid (PFNA)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanesulfonamide (PFOSA)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanesulfonic acid (PFOS)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoropentanoic acid (PFPeA)	0.470 U	0.480 U	0.470 U	0.480 U
Perfluorotetradecanoic acid (PFTeDA)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluorotridecanoic acid (PFTrDA)	1.40 U	1.40 U	1.40 U	1.40 U
Perfluoroundecanoic acid (PFUnA)	1.40 U	1.40 U	1.40 U	1.40 U
†PFOS + PFOA (EPA)	**0.00**	**0.00**	**0.00**	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**	**0.00**	**0.00**	**0.00**
§Sum of All Compounds Detected	**0.240**	**0.00**	**1.35**	**0.480**

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Notes:

ng/L = nanograms per liter; ug/kg = micrograms per kilogram; U = not detected; J = estimated; UJ = estimated non detect
Non detects are calculated as zero in the summations.

Bolded results indicate detections of PFAS

Bolded and highlighted results indicate detection of PFAS above the EPA Lifetime Health Advisory: PFOS + PFOA > 70 ng/L.

Bolded and highlighted results indicate detection of PFAS6 above the MassDEP MCL: PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA > 20 ng/L

† Lifetime Health Advisory, US Environmental Protection Agency, May 2016

The PFOS and PFOA summation includes all detections at and above the DL.

‡ PFAS Maximum Contaminant Level (MCL) Final Amendments ("MCL", 310 CMR 22.00 PFAS MCL Amendments), Massachusetts Department of Environmental Protection, October 2, 2020

The MassDEP PFAS summation includes all quantifiable results reported at and above the LOQ.

§ Sum of All Compounds Detected includes all detections at and above the DL.