

**MONTHLY PROGRESS REPORT #269
FOR AUGUST 2019**

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 August to 31 August 2019.

1. SUMMARY OF REMEDIATION ACTIONS

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of August 2019.

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, Pew Road, Base Boundary, and the Leading Edge include extraction wells, ex-situ treatment processes 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 gpm, with over 2.669 billion gallons of water treated and re-injected as of 30 August 2019. No shutdowns of the Frank Perkins Road Treatment Facility occurred during August.

The Pew Road Mobile Treatment Unit (MTU) continues to operate at a flow rate of 65 GPM, with over 623.8 million gallons of water treated and re-injected as of 30 August 2019. No shutdowns of the Pew Road MTU occurred during August.

The Base Boundary MTU continues to operate at a flow rate of 65 gpm, with over 239.3 million gallons of water treated and re-injected as of 30 August 2019. No shutdowns of the Base Boundary MTU occurred during August.

The Leading Edge system continues to operate at a flow rate of 100 gpm, with over 161.4 million gallons of water treated and re-injected as of 30 August 2019. The following shutdown of the Leading Edge system occurred during August:

- The Leading Edge MTU shut down at 0114 h on 29 August 2019 due to a "VFD Fault" alarm. The MTU was restarted at 0822 h on 29 August 2019.

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, 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 Treatment Building continues to operate at a flow rate of 225 gpm. As of 30 August 2019, over 1.157 billion gallons of water have been treated and re-injected. The following shutdown of the Northern Treatment Building occurred in August:

- Treatment Building G shut down due to a power supply interruption, caused by thunderstorms. The storm damaged the powerline insulation coil and the fuse and coil in the electrical box, which were replaced by Boston Electric and Telephone Company (BETCo). The system shut down at 0114 h on 29 August 2019 and was restarted at 1030 h on 30 August 2019.

The Northern MTU F continues to operate at a flow rate of 100 gpm while MTU E is off, pending an IX resin exchange. As of 30 August 2019, over 1.616 billion gallons of water have been treated and re-injected. The following shutdowns of the J-2 Range Northern system occurred during August:

- MTU E was turned off due to a high perchlorate concentration in the J2N-MID-1E-155A (port after the IX vessel) at 0734 h on 22 August 2019 and was left off through the end of the week. Carbon Filtration Systems (CFS) was onsite on 27 August 2019 to remove the media from two IX resin vessels and two GAC vessels. All four vessels were inspected and the two IX vessels were found in need of repair. One intact GAC vessel was filled with fresh IX resin. The MTU will remain off pending delivery of the remaining IX resin.
- MTU F shut down at 1054 h on 26 August 2019, due to a “System inlet high flow” alarm due to a communication error between the vault PLC and the MTU PLC, caused by the UPS at the J2EW0002 vault. A new PLC was installed and the MTU was restarted at 1215 h on 26 August 2019.
- MTU F shut down due to a “VFD Fault” alarm. The MTU shut down at 0106 h on 29 August 2019 and was restarted at 0853 h on 29 August 2019.

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 will enter the vadose zone and infiltrate 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 30 August 2019, over 1.267 billion gallons of water have been treated and re-injected. No shutdowns of MTUs H and I occurred during August.

MTU J continues to operate at a flow rate of 120 gpm. As of 30 August 2019, over 577.9 million gallons of water have been treated and re-injected. No shutdowns of MTU J occurred during August.

MTU K continues to operate at a flow rate of 125 gpm. As of 30 August 2019, over 694.5 million gallons of water have been treated and re-injected. No shutdowns of MTU K occurred during August.

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, ex-situ treatment process to remove explosives compounds and perchlorate from the groundwater, and use of the existing Fuel Spill-12 (FS-12) infiltration gallery to return treated water to the aquifer.

The J-3 system is currently operating at 255 gpm. As of 30 August 2019, over 1.273 billion gallons of water have been treated and re-injected. No shutdowns of the J-3 Range system occurred during August.

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, 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 30 August 2019, over 555.8 million gallons of water have been treated and re-injected. The following shutdown of the J-1 Range Southern system occurred during August:

- The system was turned off to repair a leaking sample port (J1S-EW2-INF). The system was turned off at 1005 h on 19 August 2019 and restarted at 1035 h on 19 August 2019.

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, 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 30 August 2019, over 740.4 million gallons of water have been treated and re-injected. No shutdowns of the J-1 Range Northern MTU occurred during August.

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 (IX) resin and granular activated carbon (GAC) 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 30 August 2019, over 1.804 billion gallons of water have been treated and re-injected. The following shutdowns of the CIA treatment facility occurred during August:

- The CIA3 MTU shut down due to a power supply interruption. Thunderstorms knocked out the power and Eversource was onsite on 30 August 2019. The MTU shut down at 0114 h on 29 August 2019 and remained off through the end of the week.

SUMMARY OF ACTIONS TAKEN

CIA

- Performed routine inspections of BEM cover to ensure cover is secure and intact.
- Performed intrusive investigation/re-digs in P3A1.
- Collected cued MetalMapper data for P3A2.
- Performed intrusive investigation in P3A2.

Demolition Area 1

- Exchanged bag filters at the Leading Edge MTU on 19 August 2019.

Demolition Area 2

- No activity.

Small Arms Ranges

- Bollard installation around monitoring wells at B, C, G, Former D, and Former M2 Ranges.
- Grading and gravel installation at C and D Ranges.

J-1 Range

- Exchanged bag filters on 28 August 2019.

J-2 Range

- Exchanged bag filters at MTU F on 02 August 2019.

J-3 Range

- No activity.

L Range

- No activity.

Training Areas

- No activity.

Other

- Process water samples were collected from Central Impact Area, Demolition Area 1, J1 Range Northern, J1 Range Southern, J2 Range Eastern, J2 Range Northern, and J3 Range.
- Groundwater samples were collected from Central Impact Area, J1 Range Southern, J2 Range Northern, J3 Range, and L Range.
- Surface water samples were collected from J3 Range.
- Hydraulic monitoring within J3 Range SPM program.
- Influent and groundwater samples were collected for PFAS from Demolition Area 1, J1 Range Northern, J2 Range Eastern, J2 Range Northern, and J3 Range.
- Vegetation clearing of treatment system galleries and roads and monitoring well access roads and pads.

JBCC IAGWSP Tech Update Meeting Minutes 15 August 2019

Project and Fieldwork Update

The pumps have been installed at the J-1 South new monitoring wells. Long term groundwater monitoring is underway at the J-2 Range. All treatment systems are up and running. There is a hole in one of the ion exchange vessels at one of the J-2 North MTUs. The plant is operating through one vessel until it can be drained, inspected, and fixed. There has not been a breakthrough. The J-3 in-plume well pump was replaced and it is back up and running. The contract is being finalized for the drive points at the Pocasset Baptist Church and they will be installed most likely in September. The CIA wells will be installed after Parsons completes their UXO work later this year.

In the Small Arms Ranges, validated results were received for the post-excavation samples for the 8th lift at D Range. The average was 100 ppm, therefore excavation is complete. Crews have begun grading and backfilling. They will be installing gravel, a retaining wall, and guardrails to continue with site improvements.

In the Central Impact Area for Metal Mapper, Survey Units 1, 2 and 3 are complete and they are working in 4A and 4 B. The dig teams are digging in Phase III Area 1 Survey Units C and D on the re-digs; Survey Units A, B, and E are complete. They are working on C (81% complete) and D (85% complete). The teams are averaging 40 digs per team per day. There are two teams working on Phase III Area 2 Survey Unit 1A (72% complete) and 1B (43% complete). They expect to finish by the end of August and everything is on schedule. The first BEM event is tentatively being planned for August 29th or 30th.

Five Year Review Discussion

A discussion was held on the recently received feedback from MassDEP on the revised Five Year Review report. Specifically, around the question, "If a remedy is taking longer than predicted, is it still protective?" It was agreed that a meeting was needed to determine a resolution and way forward. IAGWSP will propose a meeting date and time.

L Range Decision Document Addendum

A discussion was held on whether or not a Decision Document Addendum was needed for the L Range. It was noted that the cleanup timeframe outlined in the original Decision Document (2027) was not imminent, so an addendum was not needed at this time and could be postponed.

Action Items

The action items were discussed and updated.

JBCC Cleanup Team Meeting

The next meeting of the JBCC Cleanup Team (JBCCCT) has yet to be scheduled (previous meeting was 10 July 2019). 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.

SUMMARY OF DATA RECEIVED

Table 1 summarizes sampling for all media from 1 August to 31 August 2019. Table 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 1 August to 31 August 2019. 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 16 June 2019 to present.

Twelve operable units (OU) are under investigation and cleanup at Camp Edwards. The OUs include: Central Impact Area, Demolition Area 1, Demolition Area 2, Former A Range, J-1 Range, J-2 Range, J-3 Range, L Range, Northwest Corner, Small Arms Ranges, Training Area, and Western Boundary. 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).

2. DELIVERABLES SUBMITTED

Deliverables submitted during the reporting period include the following:

- Monthly Progress Report No. 268 for July 2019 10 August 2019
- Draft L Range 2019 Annual Environmental Monitoring Report 1 August 2019
- Draft Land Use Controls Monitoring Report 8 August 2019
- Final J-1 Range Northern and J-1 Range Southern 2019 Annual Environmental Monitoring Report 9 August 2019
- Final Small Arms Ranges 2019 Annual Environmental Monitoring Report 12 August 2019
- Final Land Use Controls Monitoring Report 15 August 2019

3. SCHEDULED ACTIONS

The following documents are being prepared or revised during September 2019:

- Project Notes on Supplemental Work (Pyrotechnics, Engineer Training Site)
- L Range 2019 Annual Environmental Monitoring Report
- Demolition Area 2 Annual Environmental Monitoring Report
- Demolition Area 1 Annual Environmental Monitoring Report
- Northwest Corner Annual Environmental Monitoring Report
- Addendum for the 2018 Source Report on re-digs
- Five Year Review report
- Work report for J-2 Range geophysical work
- Certificate of Compliance for Western Boundary
- Joint IAGWSP/IRP program fact sheet
- Land Use Controls report

TABLE 1
Sampling Progress: 1 August to 31 August 2019

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	MW-302M2	MW-302M2_F19	N	08/29/2019	Ground Water	194.35	204.43
J2 Range Northern	MW-348M2	MW-348M2_F19	N	08/29/2019	Ground Water	206.54	216.54
J2 Range Northern	MW-331M2	MW-331M2_F19	N	08/29/2019	Ground Water	195.27	205.27
J2 Range Northern	MW-331M1	MW-331M1_F19	N	08/29/2019	Ground Water	235.41	245.41
J2 Range Northern	MW-589M2	MW-589M2_F19	N	08/28/2019	Ground Water	211	221
J2 Range Northern	MW-589M2	MW-589M2_F19D	FD	08/28/2019	Ground Water	211	221
J2 Range Northern	MW-589M1	MW-589M1_F19	N	08/28/2019	Ground Water	240	250
J2 Range Northern	MW-327M2	MW-327M2_F19	N	08/28/2019	Ground Water	265.01	275.01
J2 Range Northern	MW-327M1	MW-327M1_F19	N	08/28/2019	Ground Water	296.06	306.04
J2 Range Northern	MW-345M2	MW-345M2_F19	N	08/28/2019	Ground Water	236.62	246.62
J2 Range Northern	MW-612M2	MW-612M2_F19	N	08/27/2019	Ground Water	267	277
J2 Range Northern	MW-612M1	MW-612M1_F19	N	08/27/2019	Ground Water	297	307
J2 Range Northern	J2EW3-MW1-B	J2EW3-MW1-B_F19	N	08/27/2019	Ground Water	210.66	220.66
J2 Range Northern	J2EW3-MW1-C	J2EW3-MW1-C_F19	N	08/27/2019	Ground Water	245.66	255.66
J1 Range Southern	MW-721M2	MW-721M2_R1	N	08/27/2019	Ground Water	138.5	148.5
J1 Range Southern	MW-721M1	MW-721M1_R1	N	08/27/2019	Ground Water	168.1	178.1
J1 Range Southern	MW-720M2	MW-720M2_R1	N	08/26/2019	Ground Water	126.2	136.2
J1 Range Southern	MW-720M1	MW-720M1_R1	N	08/26/2019	Ground Water	146.6	156.6
J1 Range Southern	MW-722M2	MW-722M2_R1	N	08/26/2019	Ground Water	93.9	103.9
J1 Range Southern	MW-722M1	MW-722M1_R1	N	08/26/2019	Ground Water	114.2	124.2
J3 Range	MW-247M3	MW-247M3_F19	N	08/21/2019	Ground Water	95	105
J3 Range	MW-247M2	MW-247M2_F19	N	08/21/2019	Ground Water	125	135
J3 Range	MW-247M1	MW-247M1_F19	N	08/21/2019	Ground Water	180	190
J3 Range	MW-157M3	MW-157M3_F19	N	08/21/2019	Ground Water	70	80
J3 Range	MW-157M2	MW-157M2_F19	N	08/21/2019	Ground Water	110	120
J3 Range	MW-157M1	MW-157M1_F19	N	08/21/2019	Ground Water	154	164
J3 Range	MW-250M3	MW-250M3_F19	N	08/20/2019	Ground Water	95	105
J3 Range	MW-250M3	MW-250M3_F19D	FD	08/20/2019	Ground Water	95	105
J3 Range	MW-250M2	MW-250M2_F19	N	08/20/2019	Ground Water	145	155
J3 Range	MW-250M2	MW-250M2_F19D	FD	08/20/2019	Ground Water	145	155
J3 Range	MW-250M1	MW-250M1_F19	N	08/20/2019	Ground Water	185	195
J3 Range	J3EW0032	J3EW0032_F19	N	08/20/2019	Ground Water	102	152
J3 Range	J3EW0032	J3EW0032_F19D	FD	08/20/2019	Ground Water	102	152
J3 Range	90EW0001	90EW0001_F19	N	08/20/2019	Ground Water	83.1	143.83
J3 Range	J3EWIP2	J3EWIP2_F19	N	08/20/2019	Ground Water	149.5	169.5
J3 Range	J3EWIP2	J3EWIP2_F19D	FD	08/20/2019	Ground Water	149.5	169.5
J3 Range	J3EWIP1	J3EWIP1_F19	N	08/20/2019	Ground Water	153	193
J3 Range	MW-359M2	MW-359M2_F19	N	08/19/2019	Ground Water	148.62	158.62
J3 Range	MW-198M4	MW-198M4_F19	N	08/19/2019	Ground Water	70	75
J3 Range	MW-198M4	MW-198M4_F19D	FD	08/19/2019	Ground Water	70	75
J3 Range	MW-198M3	MW-198M3_F19	N	08/19/2019	Ground Water	100	105
J3 Range	MW-198M2	MW-198M2_F19	N	08/19/2019	Ground Water	120	125
J3 Range	MW-198M1	MW-198M1_F19	N	08/19/2019	Ground Water	150	155
J3 Range	MW-155M1	MW-155M1_F19	N	08/15/2019	Ground Water	124	134
J3 Range	MW-142M2	MW-142M2_F19	N	08/15/2019	Ground Water	140	150
J3 Range	MW-227M3	MW-227M3_F19	N	08/15/2019	Ground Water	65	75
J3 Range	MW-227M2	MW-227M2_F19	N	08/15/2019	Ground Water	110	120
J3 Range	MW-227M2	MW-227M2_F19D	FD	08/15/2019	Ground Water	110	120
J3 Range	MW-227M1	MW-227M1_F19	N	08/15/2019	Ground Water	130	140
J3 Range	MW-197M3	MW-197M3_F19	N	08/14/2019	Ground Water	60.2	65.2
J3 Range	MW-197M3	MW-197M3_F19D	FD	08/14/2019	Ground Water	60.2	65.2
J3 Range	MW-197M2	MW-197M2_F19	N	08/14/2019	Ground Water	80.2	85.2
J3 Range	MW-653M2	MW-653M2_F19	N	08/14/2019	Ground Water	59.3	69.3
J3 Range	MW-653M1	MW-653M1_F19	N	08/14/2019	Ground Water	147.5	157.5
J3 Range	MW-576M3	MW-576M3_F19	N	08/13/2019	Ground Water	98.9	108.9
J3 Range	MW-576M2	MW-576M2_F19	N	08/13/2019	Ground Water	133.9	143.9
J3 Range	MW-576M2	MW-576M2_F19D	FD	08/13/2019	Ground Water	133.9	143.9
J3 Range	MW-576M1	MW-576M1_F19	N	08/13/2019	Ground Water	173.9	183.9

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 August to 31 August 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J3 Range	MW-636M2	MW-636M2_F19	N	08/13/2019	Ground Water	110.5	120.5
J3 Range	MW-636M1	MW-636M1_F19	N	08/12/2019	Ground Water	141.6	151.6
J3 Range	MW-143M3	MW-143M3_F19	N	08/12/2019	Ground Water	107	112
J3 Range	MW-143M2	MW-143M2_F19	N	08/12/2019	Ground Water	117	122
J3 Range	MW-143M1	MW-143M1_F19	N	08/12/2019	Ground Water	144	154
J3 Range	MW-144M2	MW-144M2_F19	N	08/08/2019	Ground Water	130	140
J3 Range	RS0011OSNK	RS0011OSNK_F19	N	08/08/2019	Ground Water	0	0
J3 Range	MW-243M2	MW-243M2_F19	N	08/08/2019	Ground Water	84.5	94.5
J3 Range	MW-243M1	MW-243M1_F19	N	08/08/2019	Ground Water	114.5	124.5
J3 Range	MW-701M2	MW-701M2_F19	N	08/08/2019	Ground Water	147.5	157.5
J3 Range	MW-701M1	MW-701M1_F19	N	08/08/2019	Ground Water	177	187
J3 Range	MW-637M3	MW-637M3_F19	N	08/07/2019	Ground Water	174.1	184.1
J1 Range Southern	J1S-EFF	J1S-EFF-141A	N	08/07/2019	Process Water	0	0
J1 Range Southern	J1S-MID	J1S-MID-141A	N	08/07/2019	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-141A	N	08/07/2019	Process Water	0	0
J3 Range	MW-637M2	MW-637M2_F19	N	08/07/2019	Ground Water	214.1	224.1
J3 Range	MW-637M2	MW-637M2_F19D	FD	08/07/2019	Ground Water	214.1	224.1
J3 Range	MW-637M1	MW-637M1_F19	N	08/07/2019	Ground Water	236.1	246.1
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-131A	N	08/07/2019	Process Water	0	0
J3 Range	MW-343M2	MW-343M2_F19	N	08/07/2019	Ground Water	166.82	171.82
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-J	J2E-INF-J-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-131A	N	08/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-131A	N	08/07/2019	Process Water	0	0
J3 Range	MW-343M1	MW-343M1_F19	N	08/07/2019	Ground Water	214.83	224.83
J2 Range Eastern	J2E-INF-I	J2E-INF-I-131A	N	08/07/2019	Process Water	0	0
J3 Range	J3-MW-1-B	J3-MW-1-B_F19	N	08/06/2019	Ground Water	175.61	185.61
J3 Range	J3-EFF	J3-EFF-155A	N	08/06/2019	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-155A	N	08/06/2019	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-155A	N	08/06/2019	Process Water	0	0
J3 Range	J3-INF	J3-INF-155A	N	08/06/2019	Process Water	0	0
J3 Range	J3-MW-1-C	J3-MW-1-C_F19	N	08/06/2019	Ground Water	203.61	213.61
Demolition Area 1	PR-EFF	PR-EFF-161A	N	08/06/2019	Process Water	0	0
Demolition Area 1	PR-MID-2	PR-MID-2-161A	N	08/06/2019	Process Water	0	0
Demolition Area 1	PR-MID-1	PR-MID-1-161A	N	08/06/2019	Process Water	0	0
Demolition Area 1	PR-INF	PR-INF-161A	N	08/06/2019	Process Water	0	0
J3 Range	90MP0059B	90MP0059B_F19	N	08/06/2019	Ground Water	116.39	118.89
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-161A	N	08/06/2019	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-161A	N	08/06/2019	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-161A	N	08/06/2019	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-161A	N	08/06/2019	Process Water	0	0
J3 Range	90MW0054	90MW0054_F19	N	08/06/2019	Ground Water	107	112
Demolition Area 1	D1LE-EFF	D1LE-EFF-37A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1LE-MID2	D1LE-MID2-37A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-37A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-37A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1-EFF	D1-EFF-109A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-109A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-109A	N	08/06/2019	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-109A	N	08/06/2019	Process Water	0	0

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 August to 31 August 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J3 Range	MW-218M3	MW-218M3_F19	N	08/06/2019	Ground Water	78	83
J1 Range Northern	J1N-EFF	J1N-EFF-70A	N	08/05/2019	Process Water	0	0
J1 Range Northern	J1N-MID2	J1N-MID2-70A	N	08/05/2019	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-70A	N	08/05/2019	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-70A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-155A	N	08/05/2019	Process Water	0	0
J2 Range Northern	MW-630M1	MW-630M1_F19	N	08/01/2019	Ground Water	217	227
J2 Range Northern	MW-632M2	MW-632M2_F19	N	08/01/2019	Ground Water	229.5	239.5
J2 Range Northern	MW-632M1	MW-632M1_F19	N	08/01/2019	Ground Water	254.5	264.5
Central Impact Area	CIA2-EFF	CIA2-EFF-67A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-67A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-67A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-67A	N	08/01/2019	Process Water	0	0
J2 Range Northern	MW-619M2	MW-619M2_F19	N	08/01/2019	Ground Water	234.1	244.1
Central Impact Area	CIA1-EFF	CIA1-EFF-67A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-67A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-67A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-67A	N	08/01/2019	Process Water	0	0
J2 Range Northern	MW-619M1	MW-619M1_F19	N	08/01/2019	Ground Water	255.1	265.1
Central Impact Area	CIA3-EFF	CIA3-EFF-38A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-38A	N	08/01/2019	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-38A	N	08/01/2019	Process Water	0	0
J2 Range Northern	MW-620M1	MW-620M1_F19	N	08/01/2019	Ground Water	268.6	278.6
Central Impact Area	CIA3-INF	CIA3-INF-38A	N	08/01/2019	Process Water	0	0

TABLE 2
VALIDATED EXPLOSIVES AND PERCHLORATE RESULTS
Data Received August 2019

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
J2 Range Northern	MW-330M2	MW-330M2_F19	238.01	248.04	07/25/2019	SW6850	Perchlorate	0.29		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-587M2	MW-587M2_F19	220	230	07/25/2019	SW6850	Perchlorate	43.4		ug/L	2.0	X	0.27	2.0
J2 Range Northern	MW-587M2	MW-587M2_F19D	220	230	07/25/2019	SW6850	Perchlorate	45.2		ug/L	2.0	X	0.27	2.0
J2 Range Northern	MW-587M1	MW-587M1_F19	250	260	07/25/2019	SW6850	Perchlorate	11.3		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-587M1	MW-587M1_F19D	250	260	07/25/2019	SW6850	Perchlorate	11.0		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19	162	172	07/25/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.071	J	ug/L	7.3		0.015	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19	162	172	07/25/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.2		ug/L	400		0.025	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19	162	172	07/25/2019	SW6850	Perchlorate	2.0		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19	162	172	07/25/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	4.8		ug/L	0.60	X	0.036	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19D	162	172	07/25/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.072	J	ug/L	7.3		0.015	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19D	162	172	07/25/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.1		ug/L	400		0.025	0.20
J2 Range Northern	MW-289M2	MW-289M2_F19D	162	172	07/25/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	4.5		ug/L	0.60	X	0.036	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19	305	315	07/25/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.048	J	ug/L	7.3		0.015	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19	305	315	07/25/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.35		ug/L	400		0.025	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19	305	315	07/25/2019	SW6850	Perchlorate	0.50		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19	305	315	07/25/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.1		ug/L	0.60	X	0.036	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19D	305	315	07/25/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.053	J	ug/L	7.3		0.015	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19D	305	315	07/25/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.34		ug/L	400		0.025	0.20
J2 Range Northern	MW-289M1	MW-289M1_F19D	305	315	07/25/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.9		ug/L	0.60	X	0.036	0.20
J2 Range Northern	MW-631M2	MW-631M2_F19	200.1	210.1	07/24/2019	SW6850	Perchlorate	0.21		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-631M1	MW-631M1_F19	233.1	243.1	07/24/2019	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-621M2	MW-621M2_F19	219.4	229.4	07/24/2019	SW6850	Perchlorate	2.6		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-296M2	MW-296M2_F19	214.98	224.98	07/24/2019	SW6850	Perchlorate	0.057	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-296M1	MW-296M1_F19	255.08	265.08	07/24/2019	SW6850	Perchlorate	0.57		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-588M2	MW-588M2_F19	198	208	07/18/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.41	J	ug/L	0.60		0.036	0.20
J2 Range Northern	MW-588M2	MW-588M2_F19	198	208	07/18/2019	SW6850	Perchlorate	1.7		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-702M2	MW-702M2_F19	208.1	218.1	07/18/2019	SW6850	Perchlorate	0.081	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-702M1	MW-702M1_F19	277.5	287.5	07/18/2019	SW6850	Perchlorate	0.51		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-703M2	MW-703M2_F19	224.1	234.1	07/18/2019	SW6850	Perchlorate	1.2		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-703M1	MW-703M1_F19	248	258	07/18/2019	SW6850	Perchlorate	0.30		ug/L	2.0		0.027	0.20
J3 Range	90PZ0211	90PZ0211_F19	80	110	07/17/2019	SW6850	Perchlorate	0.067	J	ug/L	2.0		0.027	0.20
J3 Range	MW-217M2	MW-217M2_F19	138	143	07/17/2019	SW6850	Perchlorate	0.46		ug/L	2.0		0.027	0.20
J3 Range	MW-295M2	MW-295M2_F19	117	127	07/15/2019	SW6850	Perchlorate	0.091	J	ug/L	2.0		0.027	0.20
J3 Range	MW-295M1	MW-295M1_F19	145	155	07/15/2019	SW6850	Perchlorate	0.45		ug/L	2.0		0.027	0.20
J3 Range	MW-193S	MW-193S_F19	32.5	37.5	07/15/2019	SW6850	Perchlorate	0.11	J	ug/L	2.0		0.027	0.20
J3 Range	MW-193M1	MW-193M1_F19	57.5	62.5	07/15/2019	SW6850	Perchlorate	0.076	J	ug/L	2.0		0.027	0.20
L Range	MW-242M1	MW-242M1_F19	235	245	07/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.75		ug/L	0.60	X	0.036	0.20
L Range	MW-651M1	MW-651M1_F19	242.3	252.3	07/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.4		ug/L	0.60	X	0.036	0.20
L Range	MW-595M1	MW-595M1_F19	255.3	265.3	07/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.3		ug/L	0.60	X	0.036	0.20
L Range	MW-595M1	MW-595M1_F19D	255.3	265.3	07/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.3		ug/L	0.60	X	0.036	0.20
J3 Range	MW-163S	MW-163S_F19	38	48	07/09/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.16	J	ug/L	400		0.025	0.20
J3 Range	MW-163S	MW-163S_F19	38	48	07/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.2		ug/L	0.60	X	0.036	0.20
J3 Range	MW-163S	MW-163S_F19	38	48	07/09/2019	SW6850	Perchlorate	3.4		ug/L	2.0	X	0.027	0.20
J3 Range	MW-163S	MW-163S_F19D	38	48	07/09/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.15	J	ug/L	400		0.025	0.20
J3 Range	MW-163S	MW-163S_F19D	38	48	07/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.2		ug/L	0.60	X	0.036	0.20

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

**TABLE 2
VALIDATED EXPLOSIVES AND PERCHLORATE RESULTS
Data Received August 2019**

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
J3 Range	MW-163S	MW-163S_F19D	38	48	07/09/2019	SW6850	Perchlorate	3.2		ug/L	2.0	X	0.027	0.20
J3 Range	MW-232M2	MW-232M2_F19	61	66	07/09/2019	SW6850	Perchlorate	0.13	J	ug/L	2.0		0.027	0.20
J3 Range	MW-232M1	MW-232M1_F19	77.5	82.5	07/09/2019	SW6850	Perchlorate	0.39		ug/L	2.0		0.027	0.20
J3 Range	MW-232M1	MW-232M1_F19	77.5	82.5	07/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.52		ug/L	0.60		0.036	0.20
J3 Range	90PZ0204	90PZ0204_F19	80	85	07/02/2019	SW6850	Perchlorate	0.044	J	ug/L	2.0		0.027	0.20
J3 Range	MW-329M2	MW-329M2_F19	150.05	160.05	07/02/2019	SW6850	Perchlorate	0.91		ug/L	2.0		0.027	0.20
J3 Range	MW-329M1	MW-329M1_F19	179.96	189.96	07/02/2019	SW6850	Perchlorate	0.11	J	ug/L	2.0		0.027	0.20
Northwest Corner	RSNW06	RSNW06_S19	0	0	06/27/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.050	J	ug/L	0.60		0.036	0.20
Northwest Corner	RSNW06	RSNW06_S19	0	0	06/27/2019	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-519M1	MW-519M1_S19	198	208	06/25/2019	SW6850	Perchlorate	0.12	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-519M1	MW-519M1_S19D	198	208	06/25/2019	SW6850	Perchlorate	0.13	J	ug/L	2.0		0.027	0.20

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

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

KGS 2019 PFAS MW&INF

Demolition Area 1

Location	D1-INF	FPR-2-INF	MW-258M1	MW-663D	PR-INF
Field Sample ID	D1-INF_PFA19	FPR-2-INF_PFA19	MW-258M1_PFA19	MW-663D_PFA19	PR-INF_PFA19
Sampling Depth	0.00 - 0.00	0.00 - 0.00	109.00 - 119.00	240.60 - 250.60	0.00 - 0.00
Sampling Date	06/24/2019	06/25/2019	06/19/2019	06/24/2019	06/25/2019
SDG	320517141	320517141	320515981	320517141	320517141
Sample Type	Normal	Normal	Normal	Normal	Normal
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	18.0 U	19.0 U	20.0 U	20.0 U	20.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.10 U	9.50 U	9.80 U	9.80 U	9.80 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.10 U	9.50 U	9.80 U	9.80 U	9.80 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.10 U	9.50 U	9.80 U	9.80 U	9.80 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.910 U	0.950 U	0.980 U	0.980 U	0.980 U
Perfluorobutanesulfonic acid (PFBS)	0.910 U	0.950 U	0.980 U	0.980 U	0.980 U
Perfluorobutanoic acid (PFBA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U
Perfluorodecane sulfonate	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U
Perfluorodecanoic acid (PFDA)	0.910 U	0.950 U	0.980 U	2.20	0.980 U
Perfluorododecanoic acid (PFDoA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U
Perfluoroheptanoic acid (PFHpA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U
Perfluorohexanesulfonic acid (PFHxS)	0.910 U	0.950 U	0.980 U	0.980 U	2.00 U
Perfluorohexanoic acid (PFHxA)	0.910 U	0.950 U	0.980 U	0.980 U	0.980 U
Perfluorononanoic acid (PFNA)	1.40 U	1.40 U	1.50 U	1.00 J	1.50 U
Perfluorooctanesulfonamide (FOSA)	2.70 U	2.80 U	2.90 U	3.00 U	2.90 U
Perfluorooctanesulfonic acid (PFOS)	2.70 U	2.80 U	2.90 U	3.00 U	2.90 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.40 U	1.50 U	1.50 U	1.50 U
Perfluoropentanoic acid (PFPA)	0.910 U	0.950 U	0.980 U	0.460 J	0.980 U
Perfluorotetradecanoic acid (PFTA)	2.70 U	2.80 U	2.90 U	3.00 U	2.90 U
Perfluorotridecanoic acid (PFTTrDA)	2.70 U	2.80 U	2.90 U	3.00 U	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U	1.40 U	1.50 U	1.20 J	1.50 U
†PFOS + PFOA (EPA)	0.00	0.00	0.00	0.00	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	0.00	0.00	0.00	3.20	0.00

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

KGS 2019 PFAS MW&INF

J1 Range Northern

Location	J1N-INF2	J1N-INF2	MW-136S	MW-564M1	MW-590M2
Field Sample ID	J1N-INF2_PFA19	J1N-INF2_PFA19R	MW-136S_PFA19	MW-564M1_PFA19	MW-590M2_PFA19
Sampling Depth	0.00 - 0.00	0.00 - 0.00	107.00 - 117.00	227.00 - 237.00	238.00 - 248.00
Sampling Date	06/17/2019	07/30/2019	06/24/2019	06/24/2019	06/24/2019
SDG	320514661	320528231	320517141	320517141	320517141
Sample Type	Normal	Normal	Normal	Normal	Normal
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	19.0 U	19.0 U	20.0 U	18.0 U	19.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.30 U	9.60 U	9.80 U	9.20 U	9.60 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.30 U	9.60 U	9.80 U	9.20 U	9.60 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.30 U	9.60 U	9.80 U	9.20 U	9.60 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.930 U	0.960 U	0.980 U	0.920 U	0.960 U
Perfluorobutanesulfonic acid (PFBS)	0.930 U	0.960 U	0.980 U	0.920 U	0.960 U
Perfluorobutanoic acid (PFBA)	1.90 U	1.40 U	0.990 J	1.40 U	1.40 U
Perfluorodecane sulfonate	1.40 U	1.40 U	1.50 U	1.40 U	1.40 U
Perfluorodecanoic acid (PFDA)	0.930 U	0.960 U	0.980 U	0.920 U	0.960 U
Perfluorododecanoic acid (PFDoA)	1.40 U	1.40 U	1.50 U	1.40 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	1.40 U	1.40 U	1.50 U	1.40 U	1.40 U
Perfluorohexanesulfonic acid (PFHxS)	0.930 U	1.90 U	2.00 U	1.80 U	0.960 U
Perfluorohexanoic acid (PFHxA)	0.930 U	0.960 U	0.980 U	0.920 U	0.960 U
Perfluorononanoic acid (PFNA)	1.40 U	1.40 U	1.50 U	1.40 U	1.40 U
Perfluorooctanesulfonamide (FOSA)	1.80 J	2.90 U	2.90 U	2.80 U	2.90 U
Perfluorooctanesulfonic acid (PFOS)	4.90	2.90 U	1.40 J	2.80 U	2.90 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.40 U	2.40	1.40 U	1.40 U
Perfluoropentanoic acid (PFPA)	0.930 U	0.960 U	0.980 U	0.920 U	0.960 U
Perfluorotetradecanoic acid (PFTA)	2.80 U	2.90 U	2.90 U	2.80 U	2.90 U
Perfluorotridecanoic acid (PFTTrDA)	2.80 U	2.90 U	2.90 U	2.80 U	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U	1.40 U	1.50 U	1.40 U	1.40 U
†PFOS + PFOA (EPA)	4.90	0.00	3.80	0.00	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	4.90	0.00	3.80	0.00	0.00

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KGS 2019 PFAS MW&INF

J2 Range Eastern

Location	J2E-INF-I	J2E-INF-J	J2E-INF-K	MW-307M3	MW-307M3	MW-368M1
Field Sample ID	J2E-INF-I_PFA19	J2E-INF-J_PFA19	J2E-INF-K_PFA19	MW-307M3_PFA19	MW-307M3_PFA19D	MW-368M1_PFA19
Sampling Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	125.80 - 135.82	125.80 - 135.82	237.35 - 247.35
Sampling Date	06/20/2019	06/20/2019	06/20/2019	06/18/2019	06/18/2019	06/18/2019
SDG	320515981	320515981	320515981	320514662	320514662	320514662
Sample Type	Normal	Normal	Normal	Normal	Field Duplicate	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)	19.0 U	19.0 U	20.0 U	18.0 U	19.0 U	17.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.70 U	9.30 U	9.80 U	9.00 U	9.60 U	8.50 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.70 U	9.30 U	9.80 U	9.00 U	9.60 U	8.50 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.70 U	9.30 U	9.80 U	9.00 U	9.60 U	8.50 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.970 U	0.930 U	0.980 U	0.900 U	0.960 U	0.850 U
Perfluorobutanesulfonic acid (PFBS)	0.970 U	0.930 U	0.980 U	0.900 U	0.960 U	0.850 U
Perfluorobutanoic acid (PFBA)	1.50 U	1.40 U	1.50 U	1.80 U	1.90 U	1.70 U
Perfluorodecane sulfonate	1.50 U	1.40 U	1.50 U	1.30 U	1.40 U	1.30 U
Perfluorodecanoic acid (PFDA)	0.970 U	0.930 U	0.980 U	0.900 U	0.960 U	1.40 J
Perfluorododecanoic acid (PFDoA)	1.50 U	1.40 U	1.50 U	1.30 U	1.40 U	0.450 J
Perfluoroheptanoic acid (PFHpA)	1.50 U	1.40 U	1.50 U	1.30 U	1.40 U	1.30 U
Perfluorohexanesulfonic acid (PFHxS)	0.970 U	0.930 U	0.980 U	0.900 U	0.960 U	0.850 U
Perfluorohexanoic acid (PFHxA)	0.970 U	0.930 U	0.980 U	0.900 U	0.960 U	0.850 U
Perfluorononanoic acid (PFNA)	1.50 U	1.40 U	1.50 U	0.880 J	0.730 J	0.650 J
Perfluorooctanesulfonamide (FOSA)	2.90 U	2.80 U	2.90 U	2.70 U	2.90 U	2.60 U
Perfluorooctanesulfonic acid (PFOS)	2.90 U	2.80 U	2.90 U	2.70 U	2.90 U	2.60 U
Perfluorooctanoic acid (PFOA)	1.50 U	1.40 U	1.50 U	1.30 U	1.40 U	1.30 U
Perfluoropentanoic acid (PFPA)	0.970 U	0.930 U	0.980 U	0.900 U	0.960 U	0.850 U
Perfluorotetradecanoic acid (PFTA)	2.90 U	2.80 U	2.90 U	2.70 U	2.90 U	2.60 U
Perfluorotridecanoic acid (PFTTrDA)	2.90 U	2.80 U	2.90 U	2.70 U	2.90 U	2.60 U
Perfluoroundecanoic acid (PFUnA)	1.50 U	1.40 U	1.50 U	1.30 U	1.40 U	4.90
†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	0.880	0.730	2.05

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J2 Range Eastern

Location	MW-368M2	MW-667M1
Field Sample ID	MW-368M2_PFAS19	MW-667M1_PFAS19
Sampling Depth	202.73 - 212.73	302.30 - 312.30
Sampling Date	06/18/2019	06/17/2019
SDG	320514662	320514661
Sample Type	Normal	Normal
PFAS 21 Cmps	Results (ng/L)	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	18.0 U	18.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	8.80 U	9.00 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	8.80 U	9.00 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	8.80 U	9.00 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.880 U	0.900 U
Perfluorobutanesulfonic acid (PFBS)	0.880 U	0.900 U
Perfluorobutanoic acid (PFBA)	1.30 U	1.80 U
Perfluorodecane sulfonate	1.30 U	1.40 U
Perfluorodecanoic acid (PFDA)	0.800 J	4.30
Perfluorododecanoic acid (PFDoA)	1.30 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	1.30 U	1.40 U
Perfluorohexanesulfonic acid (PFHxS)	0.880 U	0.900 U
Perfluorohexanoic acid (PFHxA)	0.880 U	0.900 U
Perfluorononanoic acid (PFNA)	1.30 U	2.80
Perfluorooctanesulfonamide (FOSA)	2.60 U	2.70 U
Perfluorooctanesulfonic acid (PFOS)	2.60 U	2.70 U
Perfluorooctanoic acid (PFOA)	1.30 U	1.40 U
Perfluoropentanoic acid (PFPA)	0.880 U	0.900 U
Perfluorotetradecanoic acid (PFTA)	2.60 U	2.70 U
Perfluorotridecanoic acid (PFTTrDA)	2.60 U	2.70 U
Perfluoroundecanoic acid (PFUnA)	2.40	1.60 J
†PFOS + PFOA (EPA)	0.00	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	0.800	7.10

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J2 Range Northern

Location	J2N-INF-E	J2N-INF-F	J2N-INF-F	J2N-INF-G	MW-234M2	MW-313M1
Field Sample ID	J2N-INF-E_PFAS19	J2N-INF-F_PFAS19	J2N-INF-F_PFAS19R	J2N-INF-G_PFAS19	MW-234M2_PFAS19	MW-313M1_PFAS19
Sampling Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	110.00 - 120.00	255.40 - 265.40
Sampling Date	06/18/2019	06/18/2019	07/30/2019	07/30/2019	06/17/2019	06/19/2019
SDG	320514662	320514662	320528231	320528231	320514661	320515981
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)	19.0 U	19.0 U	19.0 U	19.0 U	18.0 U	20.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.30 U	9.30 U	9.60 U	9.70 U	8.80 U	9.80 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.30 U	9.30 U	9.60 U	9.70 U	8.80 U	9.80 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.30 U	9.30 U	9.60 U	9.70 U	8.80 U	9.80 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.930 U	0.400 J	0.500 J	0.970 U	0.880 U	0.980 U
Perfluorobutanesulfonic acid (PFBS)	0.930 U	0.930 U	0.960 U	1.40 J	0.880 U	0.980 U
Perfluorobutanoic acid (PFBA)	1.40 U	1.90 U	1.40 U	1.50 U	1.80 U	0.700 J
Perfluorodecane sulfonate	1.40 U	1.40 U	1.40 U	1.50 U	1.30 U	1.50 U
Perfluorodecanoic acid (PFDA)	0.930 U	0.930 U	0.960 U	0.970 U	0.880 U	1.20 J
Perfluorododecanoic acid (PFDoA)	1.40 U	1.40 U	1.40 U	1.50 U	1.30 U	1.50 U
Perfluoroheptanoic acid (PFHpA)	1.40 U	0.940 J	1.00 J	1.50 U	1.30 U	1.50 U
Perfluorohexanesulfonic acid (PFHxS)	0.930 U	9.90	9.00	1.90 U	0.600 J	0.980 U
Perfluorohexanoic acid (PFHxA)	0.930 U	1.20 J	1.30 J	2.30	0.880 U	0.980 U
Perfluorononanoic acid (PFNA)	1.40 U	1.40 U	1.40 U	1.50 U	1.30 U	1.10 J
Perfluorooctanesulfonamide (FOSA)	2.80 U	2.80 U	2.90 U	2.90 U	2.60 U	2.90 U
Perfluorooctanesulfonic acid (PFOS)	2.80 U	2.80 U	1.10 J	2.90 U	1.90 J	2.90 U
Perfluorooctanoic acid (PFOA)	1.40 U	1.70 J	1.50 J	1.50 U	0.550 J	1.50 U
Perfluoropentanoic acid (PFPA)	0.930 U	0.840 J	1.00 J	1.20 J	0.880 U	0.680 J
Perfluorotetradecanoic acid (PFTA)	2.80 U	2.80 U	2.90 U	2.90 U	2.60 U	2.90 U
Perfluorotridecanoic acid (PFTTrDA)	2.80 U	2.80 U	2.90 U	2.90 U	2.60 U	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U	1.40 U	1.40 U	1.50 U	1.30 U	1.40 J
†PFOS + PFOA (EPA)	0.00	1.70	2.60	0.00	2.45	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	0.00	12.5	12.6	0.00	3.05	2.30

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J2 Range Northern

Location	MW-587M2
Field Sample ID	MW-587M2_PFAS19
Sampling Depth	220.00 - 230.00
Sampling Date	06/19/2019
SDG	320515981
Sample Type	Normal
PFAS 21 Cmps	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	19.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.70 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.70 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.70 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.970 U
Perfluorobutanesulfonic acid (PFBS)	0.970 U
Perfluorobutanoic acid (PFBA)	1.50 U
Perfluorodecane sulfonate	1.50 U
Perfluorodecanoic acid (PFDA)	0.970 U
Perfluorododecanoic acid (PFDoA)	1.50 U
Perfluoroheptanoic acid (PFHpA)	1.50 U
Perfluorohexanesulfonic acid (PFHxS)	0.970 U
Perfluorohexanoic acid (PFHxA)	0.970 U
Perfluorononanoic acid (PFNA)	1.50 U
Perfluorooctanesulfonamide (FOSA)	2.90 U
Perfluorooctanesulfonic acid (PFOS)	2.90 U
Perfluorooctanoic acid (PFOA)	1.50 U
Perfluoropentanoic acid (PFPA)	0.970 U
Perfluorotetradecanoic acid (PFTA)	2.90 U
Perfluorotridecanoic acid (PFTTrDA)	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.50 U
†PFOS + PFOA (EPA)	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	0.00

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KGS 2019 PFAS MW&INF

J3 Range

Location	J3-INF	J3-INF	MW-163S	MW-163S	MW-163S	MW-227M2
Field Sample ID	J3-INF_PFA19	J3-INF_PFA19D	MW-163S_PFA19	MW-163S_PFA19D	MW-163S_PFA19R	MW-227M2_PFA19
Sampling Depth	0.00 - 0.00	0.00 - 0.00	38.00 - 48.00	38.00 - 48.00	38.00 - 48.00	110.00 - 120.00
Sampling Date	06/17/2019	06/17/2019	06/18/2019	06/18/2019	07/30/2019	06/19/2019
SDG	320514661	320514661	320514662	320514662	320528231	320515981
Sample Type	Normal	Field Duplicate	Normal	Field Duplicate	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)	19.0 U	18.0 U	17.0 U	17.0 U	19.0 U	19.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.40 U	9.20 U	8.60 U	8.60 U	9.30 U	9.60 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.40 U	9.20 U	8.60 U	8.60 U	9.30 U	9.60 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.40 U	9.20 U	8.60 U	8.60 U	9.30 U	9.60 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.940 U	0.920 U	0.860 U	0.860 U	0.930 U	0.960 U
Perfluorobutanesulfonic acid (PFBS)	0.940 U	0.920 U	0.860 U	0.860 U	0.930 U	0.960 U
Perfluorobutanoic acid (PFBA)	1.90 U	1.80 U	1.70 U	1.70 U	0.560 J	1.40 U
Perfluorodecane sulfonate	1.40 U	1.40 U	1.30 U	1.30 U	1.40 U	1.40 U
Perfluorodecanoic acid (PFDA)	0.940 U	0.920 U	0.860 U	0.860 U	0.930 U	0.960 U
Perfluorododecanoic acid (PFDoA)	1.70 J	1.40 U	1.30 U	1.30 U	1.40 U	1.40 U
Perfluoroheptanoic acid (PFHpA)	1.40 U	1.40 U	1.30 U	1.30 U	1.40 U	1.40 U
Perfluorohexanesulfonic acid (PFHxS)	1.50 J	1.50 J	0.690 J	0.610 J	1.90 U	0.540 J
Perfluorohexanoic acid (PFHxA)	0.940 U	0.920 U	0.410 J	0.860 U	0.930 U	0.960 U
Perfluorononanoic acid (PFNA)	1.40 U	1.40 U	1.30 U	1.30 U	1.40 U	1.40 U
Perfluorooctanesulfonamide (FOSA)	2.80 U	2.80 U	2.60 U	2.60 U	2.80 U	2.90 U
Perfluorooctanesulfonic acid (PFOS)	2.80 U	2.80 U	12.0	12.0	12.0	2.90 U
Perfluorooctanoic acid (PFOA)	0.520 J	1.40 U	1.70	1.60 J	1.30 J	1.40 U
Perfluoropentanoic acid (PFPA)	0.940 U	0.920 U	0.860 U	0.860 U	0.930 U	0.960 U
Perfluorotetradecanoic acid (PFTA)	2.80 U	2.80 U	2.60 U	2.60 U	2.80 U	2.90 U
Perfluorotridecanoic acid (PFTTrDA)	1.40 J	2.80 U	2.60 U	2.60 U	2.80 U	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U	1.40 U	1.30 U	1.30 U	1.40 U	1.40 U
†PFOS + PFOA (EPA)	0.520	0.00	13.7	13.6	13.3	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	2.02	1.50	14.4	14.2	13.3	0.540

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J3 Range

Location	MW-250M2
Field Sample ID	MW-250M2_PFAS19
Sampling Depth	145.00 - 155.00
Sampling Date	06/20/2019
SDG	320515981
Sample Type	Normal
PFAS 21 Cmps	Results (ng/L)
6:2 Fluorotelomer sulfonate (6:2 FTS)	19.0 U
8:2 Fluorotelomer sulfonate (8:2 FTS)	9.70 U
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	9.70 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	9.70 U
Perfluoro-1-heptanesulfonate (PFHpS)	0.970 U
Perfluorobutanesulfonic acid (PFBS)	0.970 U
Perfluorobutanoic acid (PFBA)	0.710 J
Perfluorodecane sulfonate	1.40 U
Perfluorodecanoic acid (PFDA)	0.970 U
Perfluorododecanoic acid (PFDoA)	1.40 U
Perfluoroheptanoic acid (PFHpA)	1.40 U
Perfluorohexanesulfonic acid (PFHxS)	0.970 U
Perfluorohexanoic acid (PFHxA)	0.970 U
Perfluorononanoic acid (PFNA)	1.40 U
Perfluorooctanesulfonamide (FOSA)	2.90 U
Perfluorooctanesulfonic acid (PFOS)	2.90 U
Perfluorooctanoic acid (PFOA)	1.40 U
Perfluoropentanoic acid (PFPA)	0.970 U
Perfluorotetradecanoic acid (PFTA)	2.90 U
Perfluorotridecanoic acid (PFTTrDA)	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U
†PFOS + PFOA (EPA)	0.00
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	0.00

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Notes:

ng/L = nanograms per liter; ug/kg = micrograms per kilogram; U = not detected; J = estimated

UJ = estimated non detect

The LOQ value will be used to report non-detects when blank contamination occurs

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 PFAS above the MassDEP: PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA > 20 ng/L

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

‡ PFAS-Related revisions to the Massachusetts Contingency Plan ("MCP", 310 CMR 40.0000), Massachusetts Department of Environmental Protection, April 19, 2019