

**MONTHLY PROGRESS REPORT #271
FOR OCTOBER 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 October to 31 October 2019.

1. SUMMARY OF REMEDIATION ACTIONS

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of October 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 2.683 billion gallons of water treated and re-injected as of 25 October 2019. No shutdown(s) of the Frank Perkins Road Treatment Facility occurred during October.

The Pew Road Mobile Treatment Unit (MTU) continues to operate at a flow rate of 65 GPM, with over 628.7 million gallons of water treated and re-injected as of 25 October 2019. No shutdown(s) of the Pew Road MTU occurred during October.

The Base Boundary MTU continues to operate at a flow rate of 65 gpm, with over 244.6 million gallons of water treated and re-injected as of 25 October 2019. No shutdown(s) of the Base Boundary MTU occurred during October.

The Leading Edge system continues to operate at a flow rate of 100 gpm, with over 168.6 million gallons of water treated and re-injected as of 25 October 2019. The following shutdown(s) of the Leading Edge system occurred during October:

- The Leading Edge MTU shut down due to a power supply interruption. The MTU shut down at 0930 h on 15 October 2019 and was restarted at 1120 h on 15 October 2019.
- The Leading Edge MTU shut down due to a power supply interruption caused by strong winds felling trees and powerlines. The MTU shut down at 0127 h on 17 October 2019 and was restarted at 1033 h on 21 October 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 25 October 2019, over 1.176 billion gallons of water have been treated and re-injected. No shutdown(s) of the Northern Treatment Building occurred in October.

The Northern MTUs E and F continues to operate at a flow rate of 250 gpm. As of 25 October 2019, over 1.624 billion gallons of water have been treated and re-injected. The following shutdown(s) of the J-2 Range Northern system occurred during October:

- MTU F shut down due to a power supply interruption caused by strong winds. The MTU shut down at 0142 h on 17 October 2019 and was restarted at 0800 h on 17 October 2019.
- MTU E was turned off due to a high perchlorate concentration in the J2N-MID-1E-155A (port after the IX vessel) results. MTU E was turned off at 0734 h on 22 August 2019 and was restarted at 1200 h on 22 October 2019. 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. Two formally GAC vessels (nearest the MTU influent) were filled with fresh IX resin on 27 August and 18 September 2019. The floors were repaired on 21 October 2019. The two former IX resin vessels were removed on 30 September 2019, repaired off-post and filled with GAC media, and reinstalled as the fifth and sixth vessels in series on 22 October 2019.
- MTU F shut down due to a “VFD Fault” alarm caused by a power supply interruption. The MTU shut down at 1705 h on 27 October 2019 and was restarted at 0843 h on 28 October 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 25 October 2019, over 1.287 billion gallons of water have been treated and re-injected. The following shutdown(s) of MTUs H and I occurred during October:

- MTUs H and I shut down due to a power supply interruption caused by strong winds. The MTUs shut down at 0142 h on 17 October 2019 and were restarted at 0744 h on 17 October 2019.

MTU J continues to operate at a flow rate of 120 gpm. As of 25 October 2019, over 587.4 million gallons of water have been treated and re-injected. The following shutdown(s) of MTU J occurred during October:

- MTU J shut down due to a “VFD Fault” alarm, caused by a power supply interruption. The MTU shut down at 0318 h on 21 October 2019 and was restarted at 0933 h on 21 October 2019.

- MTU J was turned off to repair leaks on the IX resin vessels' influent pipe and the guard GAC vessels' effluent pipe. The MTU was turned off at 0845 h on 25 October 2019 and was restarted at 1430 h on 25 October 2019.

MTU K continues to operate at a flow rate of 125 gpm. As of 25 October 2019, over 704.6 million gallons of water have been treated and re-injected. No shutdown(s) of MTU K occurred during October.

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 25 October 2019, over 1.292 billion gallons of water have been treated and re-injected. The following shutdown(s) of the J-3 Range system occurred during October:

- The system shut down due to a power supply interruption caused by strong winds. The facility shut down at 0230 h on 17 October 2019 and was restarted at 0909 h on 17 October 2019.

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 25 October 2019, over 565.3 million gallons of water have been treated and re-injected. The following shutdown(s) of the J-1 Range Southern system occurred during October:

- Extraction well J1SEW0002 was turned off to run J1SEW0001 for SPM sampling. J1SEW0002 was turned off at 1335 h on 29 October 2019 and restarted at 1430 h on 29 October 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 25 October 2019, over 760.1 million gallons of water have been treated and re-injected. The following shutdown(s) of the J-1 Range Northern MTU occurred during October:

- Extraction well J1NEW0001 shut down due to a “VFD Fault” alarm due to a power supply interruption. J1NEW0001 shut down at 1700 h on 27 October 2019 and restarted at 0835 h on 28 October 2019.

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 25 October 2019, over 1.859 billion gallons of water have been treated and re-injected. The following shutdown(s) of the CIA treatment facility occurred during October:

- The CIA1 MTU was turned off to perform a carbon media exchange. The MTU was turned off at 0752 h on 01 October 2019, the exchanged was perform by Carbon Filtration Systems (CFS) on 02 October 2019, and the MTU was restarted at 0750 h on 03 October 2019.

SUMMARY OF ACTIONS TAKEN

CIA

- Performed routine inspections of BEM cover to ensure cover is secure and intact.
- Performed intrusive investigation of P3A2.
- Completed MetalMapper recollects.

Demolition Area 1

- Exchanged bag filters on 11 October 2019.

Demolition Area 2

- No activity.

Small Arms Ranges

- Grading and gravel installation at D Range.
- Guardrail installation at B, C, and D Ranges.
- Seeding at D and Former B Ranges.

J-1 Range

- Hydraulic monitoring within J1 North SPM program.
- Hydraulic monitoring within J1 South SPM program.
- Exchanged bag filters on 18 October 2019.
- Exchanged bag filters on 31 October 2019.

J-2 Range

- No activity.

J-3 Range

- Exchanged bag filters on 17 October 2019.

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 and J1 Range Southern.

JBCC IAGWSP Tech Update Meeting Minutes 10 October 2019

Project and Fieldwork Update

Long term groundwater monitoring is underway at the J-1 Range South. The drive points at the Pocasset Baptist Church are tentatively scheduled to begin November 4th. CIA drilling will commence after Parsons de-mobilizes. All treatment systems are up and running with the exception of EW-1 at J-2 North MTU E. The two damaged vessels have been removed and are off-site being repaired. It is anticipated they will be back in two weeks. The floor of the container will be repaired at the same time the vessels are being re-installed.

In the Small Arms Ranges, site improvement fieldwork at B, C, and D Ranges is continuing. Currently, guardrails are being installed. Hydro seeding will be completed next week.

In the Central Impact Area, Metal Mapper recollects should finish this week weather permitting. The team continues with digs, but their completion date has been pushed to the end of November.

MassDEP noted that Eversource will be performing their soil moving during the end of November or beginning of December. They will forward the haul routes to the group.

Action Items

The action items were discussed and updated.

Demolition Area 1 Annual Monitoring Report Presentation

A presentation was provided on the Demolition Area 1 Annual Monitoring Report. During the reporting period (July 2018 to June 2019), no new investigative work was conducted, however the base boundary extraction well was retrofitted with a packer assembly.

Treatment system performance, sampling locations, groundwater monitoring results, and trends were reviewed and discussed. For Zone 1 (source to Frank Perkins Road), the maximum RDX concentration was 2.91 ppb (MW-19S) and the maximum perchlorate concentration was 0.24 ppb (MW-165M2). For Zone 2 (Frank Perkins Road to Pew Road), the maximum RDX concentration was 0.77 ppb (MW-341M2) and the maximum perchlorate concentration was 1.37 ppb (MW- 341M2). For Zone 3 (Pew Road to Base Boundary), the maximum RDX concentration was 1.61 ppb (MW-663D) and the maximum perchlorate concentration was 19.4 ppb (MW-663D). For Zone 4 (off-base), RDX was detected in on sample at 0.16 ppb (MW-556M1) and the maximum perchlorate concentration was 2.72 ppb (MW-611M1).

Results of hydraulic monitoring and a capture zone analysis were discussed. For the aquifer hydraulic monitoring, one site-wide synoptic water level round was conducted during the reporting period. Hydraulic

monitoring observations were consistent with past reporting periods. A hydraulic monitoring event was performed in July to assess the base boundary extraction well packering. For the capture zone analysis, the capture zones were developed manually and later compared to model simulated capture zones. Contamination in Zone 1 (principally RDX) is adequately being captured by D1-EW-4 and D1-EW501. Perchlorate contamination in Zone 2 above the Pew Rd extraction well silt/clay layer is below RDX and perchlorate screening values. D1-EW-2 flow rate reduced to 65 gpm in February 2019. Perchlorate contamination in Zone 3 west of MW-341M2 and south of MW-663D were outside D1-EW-3 capture zone. However water levels in Zone 3 under packer conditions show an expanded capture zone. The Zone 4 perchlorate plume is within capture zone of D1-EW-5. Contamination downgradient of the extraction well is predicted to attenuate/discharge to Buzzards Bay within 3-4 years.

Measured vs. model predicted mass removal statistics were reviewed and discussed. The total perchlorate removed for the reporting period for all systems was 0.42 pounds and RDX was 0.14 pounds. Decision Document (DD) cleanup timelines were discussed. The DD estimated perchlorate would clean up in 2025; this was based on the 2013 technical memorandum. Current cleanup predictions using the updated plume shell predicts perchlorate will be below 2 ppb before 2025 consistent with Addendum No. 2 to the DD. The DD estimates RDX will clean up by 2022. Current predictions indicate all plumes are expected to be reduced to below the RBC of 0.6 ppb by 2022 in accordance with timelines outlined in the Decision Document, with the exception of the plume upgradient of D1-EW-501. The plume shell updated with data through June 2019 using drift function indicates RDX will be below the RBC by 2022 with the exception of upgradient of D1-EW-501 and segment downgradient of MW-663D. It is predicted all will be below RBC by 2024.

IAGWSP is recommending measuring water levels two more times for the base boundary system to see if capture zone expands as a result of packering. In addition, IAGWSP is recommending a similar model analysis is done for the leading edge system (D1-EW-5) to determine if deep capture is feasible via packering. For the chemical monitoring network, in Zone 1 IAGWSP recommends removing the following wells from the perchlorate program due to very low detections: D1-EW-4 (0.08 ppb–maximum), D1-EW-501 (0.12 ppb–maximum), MW-139M2 (0.083 ppb–maximum), MW-165M1 (0.075 ppb–maximum), MW-165M2 (0.3 ppb–maximum), MW-274 (formerly D1- EW-1) (0.15 ppb–maximum) and MW-432 (formerly D1-EW-502) (0.14 ppb). There are no changes recommended for the monitoring programs in Zones 2 or 3. In Zone 4, the following are proposed to be removed from the explosives monitoring program: MW-582 M1/M2, MW-598 M1/M2, MW-610 M1/M2, MW-611 M1/M2, MW-641 M1/M2, and MW-642 M1/M2. Neither RDX nor any other explosive compound has been detected in these wells since sampling commenced in 2013. MassDEP comments have been received on the monitoring report; EPA comments are pending.

Demolition Area 2 Annual Monitoring Report Presentation

A presentation was provided on the Demolition Area 2 Annual Monitoring Report. During the reporting period (June 2018 to May 2019), no new field work was conducted. Sampling locations, groundwater monitoring results, and trends were reviewed and discussed. In fall 2018, RDX was detected in five of ten monitoring wells sampled at a maximum concentration of 0.31 ppb (MW- 161S). In spring 2019, RDX was detected in eight of twenty-one samples at concentrations ranging from 0.09 ppb (MS-573M2) to 0.52 ppb (MW-404M2). No samples exceeded the 0.6 ppb risk- based level or the 2 ppb EPA Lifetime Health Advisory. No other explosive compounds were detected during this reporting period.

Figures showing RDX trend plots and the model predicted plumes vs. observed concentrations were displayed. Decision Document cleanup timelines were discussed. The estimates presented in the 2015 Decision Document addendum of below Health Advisory (2 ppb) by 2016, below Risk- Based Level (0.6 ppb) by 2018, and below Background Level (0.25 ppb) by 2025 are still accurate. It was noted that during the reporting period, no monitoring wells exceeded 2 ppb or 0.6 ppb. The maximum detected

concentration was 0.52 ppb (MW404M2). IAGWSP is not proposing any changes to the monitoring network at this time. IAGWSP does recommend creating a new plume shell for the 2020 annual report as the prior plume shell was created with data through 2014.

JBCC IAGWSP Tech Update Meeting Minutes 31 October 2019

Project and Fieldwork Update

The drive points at the Pocasset Baptist Church have been delayed until November 18th due to rig availability. The two J-2 North MTU E damaged vessels were returned and restarted on October 22nd. As long as they two extraction wells can run continuously for the next two weeks, PFAS sampling will be done around November 12th. CIA drilling will commence early next year after Parsons de-mobilizes.

In the Small Arms Ranges, contractors finished the remaining improvement fieldwork (hydroseeding and guardrails) at B, C, and D Ranges. A completion of work report is pending. The geophysical and EM-61 surveys at the Training Areas and J-3 Ranges are scheduled for February – April 2020. Soil excavation at KD Range is scheduled for early February.

UXO work continues in the Central Impact Area. Parsons added a sixth team this week. They are continuing with digs and anticipate to be completed by Thanksgiving.

The LIDAR maps were displayed and discussed. Benton Williams (USACE) explained the process for the contouring on the LIDAR maps. He noted that he went through a grid system and collected a count of both large and small craters within each grid and imported into an Excel file. Using that grid system, contour maps were produced to show density of craters both large and small; trying to discern which areas were potential target areas and if—based on the size of craters—a certain size of munition was used in an area. Benton noted he's been working with USACE GIS staff to determine if there's a way to more easily collect the crater count without doing it by hand. In the collection, they specifically focused on counting grids where new transects and new collection of data would be taking place, allowing for a crater count comparison to the actual munition density in the grid. As more information comes in, they can better determine if there is a genuine correlation between crater density and the number of MEC items recovered.

Looking at the map of UXO count in the southwestern corner, you can see that there doesn't seem to be much of a correlation. This makes sense because found craters imply that there was detonation/proper functioning of the munition. As more data are collected and compared to the rest of the grids as transects are dug, we should be able to verify that hypothesis.

A series of figures showing the LIDAR data and small and large craters with crater and UXO counts per grid were displayed and discussed.

Action Items

The action items were discussed and updated.

Central Impact Area 100% Verification Grid Presentation

A presentation was provided on the results of the CIA Phase 3 Area 2 100% dig validation. A figure showing the validation grids (22_42, 44_57, and 54_53) 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 was displayed along with the results for grid 54_53. It was noted that Metal Mapper data were collected for all EM61 anomalies in 1/8-acre (22_42 and 44_57) and ¼-acre (54_53) grids. For grid 22_42, there were 159 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 38 met the dig criteria resulting in a recommended dig rate of 23.9%. The remaining 123 anomalies were dug for QA. Five TOI (UXO or UXO-like items) were recovered. For the classification results, 123 clutter items were correctly classified, 21.15% of the clutter was incorrectly classified as “likely- TOI” therefore meeting the goal of reduction of clutter digs by 70%.

The incorrect classification becomes more common for good matches to smaller munitions than for large piles of frag matching large munitions in lower density grids – smaller frag modeled more accurately. Eighteen of 38 predicted sources for digs were smaller than 60mm (37mm, small ISO, or 2.36-in rocket warhead).

For grid 44_57, there were 343 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 103 met the dig criteria resulting in a recommended dig rate of 30.0%. The remaining 214 anomalies were dug for QA. Eighteen TOI (UXO or UXO-like items) were recovered. For the classification results, 241 clutter items were correctly classified, 26.07% of the clutter was incorrectly classified as “likely- TOI” therefore meeting the goal of reduction of clutter digs by 70%.

This grid was more like previous grids than 22_42, with most predicted sources 60mm or greater, only 12 of 104 smaller than 60mm. There was larger frag and/or larger quantities of frag recovered. They were classified as digs because they are large objects or because the number of sources overwhelms the model.

For grid 54_53, there were 490 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 112 met the dig criteria resulting in a recommended dig rate of 22.9%. The remaining 385 anomalies were dug for QA. Twenty-two TOI (UXO or UXO-like items) were recovered. One additional TOI was recovered outside of the grid boundary. For the classification results, 384 clutter items were correctly classified, 19.337% of the clutter was incorrectly classified as “likely-TOI” therefore meeting the goal of reduction of clutter digs by 70%.

This grid was similar to 44_57, with most predicted sources 60mm or greater, only 6 of 112 were smaller than 60mm. There was larger frag and/or larger quantities of frag recovered. They were classified as digs because they are large objects or because the number of sources overwhelms the model. The incorrectly classified TOI was an 81mm at 55cm depth. The depth of the item, potentially offset from the EM61 target was the reason for the poor model of source and non-TOI classification.

The current status and path forward was reviewed. In Phase III Area 1, the re-digs are complete through USACE QA. The Phase 3 Area 2 Metal Mapper data collection and classification is complete. Data and target lists have been approved by USACE and all QC/QA seeds were within 1m of a dig location. The Phase 3 Area 2 survey unit 1 digs are complete and through USACE QA. Survey Unit 2 digs are complete with the exception of a few QC re-checks. Excavation is ongoing in Survey Units 3, 4, and 5. All validation grids have been selected and excavation of EM61 targets in remaining validation grids (SUs 3B and 4A) will be performed as soon as AGC digs in those grids are complete. Phase 3 Area 2 digging is expected to be complete in late November/early December. A status map showing work conducted as of October 25 2019 was displayed.

JBCC Cleanup Team Meeting

The next meeting of the JBCC Cleanup Team (JBCCCT) has yet to be scheduled (previous meeting was 9 October 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 October to 31 October 2019. Table 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 1 October to 31 October 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. 270 for September 2019 10 October 2019
- Final Northwest Corner 2019 Annual Environmental Monitoring Report 16 October 2019
- Final Demolition Area 2 2019 Annual Environmental Monitoring Report 17 October 2019
- Final L Range 2019 Annual Environmental Monitoring Report 17 October 2019
- Certificate of Completion for Groundwater Monitoring at Western Boundary Groundwater Plume 22 October 2019
- Draft Central Impact Area 2019 Annual Environmental Monitoring Report 30 October 2019
- Draft Demolition Area 1 2019 Annual Environmental Monitoring Report 31 October 2019

3. SCHEDULED ACTIONS

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

- Demolition Area 1 Annual Environmental Monitoring Report
- Central Impact Area Environmental Monitoring Report
- Updated 2018 Source Report to include re-digs
- Five Year Review Report

TABLE 1
Sampling Progress: 1 October to 31 October 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J1 Range Southern	MW-527M1	MW-527M1_F19	N	10/30/2019	Ground Water	165	175
J1 Range Southern	MW-523M1	MW-523M1_F19	N	10/30/2019	Ground Water	158	168
J1 Range Southern	MW-522M2	MW-522M2_F19	N	10/30/2019	Ground Water	165	175
J1 Range Southern	MW-522M1	MW-522M1_F19	N	10/30/2019	Ground Water	198	208
J1 Range Southern	J1S-EW1-INF	J1S-EW1-INF_F19	N	10/29/2019	Process Water	0	0
J1 Range Southern	J1S-EW2-INF	J1S-EW2-INF_F19	N	10/29/2019	Process Water	0	0
J1 Range Southern	MW-482M3	MW-482M3_F19	N	10/29/2019	Ground Water	98.18	108.18
J1 Range Southern	MW-482M2	MW-482M2_F19	N	10/29/2019	Ground Water	172.64	182.64
J1 Range Southern	MW-482M2	MW-482M2_F19D	FD	10/29/2019	Ground Water	172.64	182.64
J1 Range Southern	DP-389	DP-389_F19	N	10/28/2019	Ground Water	157.7	162.7
J1 Range Southern	MW-528M1	MW-528M1_F19	N	10/28/2019	Ground Water	117	127
J1 Range Southern	MW-131S	MW-131S_F19	N	10/28/2019	Ground Water	96	106
J1 Range Southern	MW-483M1	MW-483M1_F19	N	10/24/2019	Ground Water	139.52	149.52
J1 Range Southern	MW-488PZ	MW-488PZ_F19	N	10/24/2019	Ground Water	119.28	129.28
J1 Range Southern	MW-488M1	MW-488M1_F19	N	10/24/2019	Ground Water	149.62	159.62
J1 Range Southern	MW-521M1	MW-521M1_F19	N	10/23/2019	Ground Water	158	168
J1 Range Southern	MW-645M2	MW-645M2_F19	N	10/23/2019	Ground Water	143.5	153.5
J1 Range Southern	MW-645M1	MW-645M1_F19	N	10/23/2019	Ground Water	183.5	193.5
J1 Range Southern	MW-645M1	MW-645M1_F19D	FD	10/23/2019	Ground Water	183.5	193.5
J1 Range Southern	MW-481M2	MW-481M2_F19	N	10/23/2019	Ground Water	146.28	156.28
J1 Range Southern	MW-481M1	MW-481M1_F19	N	10/23/2019	Ground Water	189.74	199.74
J1 Range Southern	MW-398M2	MW-398M2_F19	N	10/22/2019	Ground Water	131.53	141.53
J1 Range Southern	MW-398M1	MW-398M1_F19	N	10/22/2019	Ground Water	172.15	182.15
J1 Range Southern	DP-379	DP-379_F19	N	10/22/2019	Ground Water	184.3	189.3
J1 Range Southern	MW-480M2	MW-480M2_F19	N	10/17/2019	Ground Water	143.57	153.57
J1 Range Southern	MW-403M2	MW-403M2_F19	N	10/17/2019	Ground Water	127.26	137.36
J1 Range Southern	MW-403M1	MW-403M1_F19	N	10/17/2019	Ground Water	159.9	169.89
J1 Range Southern	MW-669M2	MW-669M2_F19	N	10/17/2019	Ground Water	201.7	211.7
J1 Range Southern	MW-669M2	MW-669M2_F19D	FD	10/17/2019	Ground Water	201.7	211.7
J1 Range Southern	MW-669M1	MW-669M1_F19	N	10/17/2019	Ground Water	223.7	233.7
J1 Range Southern	MW-524M1	MW-524M1_F19	N	10/16/2019	Ground Water	148	158
J1 Range Southern	MW-524M1	MW-524M1_F19D	FD	10/16/2019	Ground Water	148	158
J1 Range Southern	MW-646M2	MW-646M2_F19	N	10/16/2019	Ground Water	168	178
J1 Range Southern	MW-646M1	MW-646M1_F19	N	10/16/2019	Ground Water	198	208
J1 Range Southern	MW-591M2	MW-591M2_F19	N	10/16/2019	Ground Water	165	175
J1 Range Southern	MW-591M1	MW-591M1_F19	N	10/16/2019	Ground Water	200	210
J1 Range Southern	MW-670M2	MW-670M2_F19	N	10/15/2019	Ground Water	198.5	208.5
J1 Range Southern	MW-670M1	MW-670M1_F19	N	10/15/2019	Ground Water	220.5	230.5
J1 Range Southern	MW-402M2	MW-402M2_F19	N	10/15/2019	Ground Water	155.24	165.27
J1 Range Southern	MW-402M1	MW-402M1_F19	N	10/15/2019	Ground Water	190.14	200.13
J1 Range Southern	MW-647M2	MW-647M2_F19	N	10/10/2019	Ground Water	189.3	199.3
J1 Range Southern	MW-647M1	MW-647M1_F19	N	10/10/2019	Ground Water	211.3	221.3
J1 Range Southern	MW-647M1	MW-647M1_F19D	FD	10/10/2019	Ground Water	211.3	221.3
J1 Range Southern	MW-592M2	MW-592M2_F19	N	10/10/2019	Ground Water	158	168
J1 Range Southern	MW-592M1	MW-592M1_F19	N	10/10/2019	Ground Water	201	211
Central Impact Area	MW-625M2	MW-625M2_F19	N	10/09/2019	Ground Water	230	240
Central Impact Area	MW-625M1	MW-625M1_F19	N	10/09/2019	Ground Water	260	270
Central Impact Area	MW-699M2	MW-699M2_F19	N	10/09/2019	Ground Water	221	231
Central Impact Area	MW-699M1	MW-699M1_F19	N	10/09/2019	Ground Water	261.5	271.5
Central Impact Area	MW-695S	MW-695S_F19	N	10/09/2019	Ground Water	130	140
Central Impact Area	MW-695S	MW-695S_F19D	FD	10/09/2019	Ground Water	130	140
J1 Range Southern	MW-360M2	MW-360M2_F19	N	10/08/2019	Ground Water	102	112
Central Impact Area	CIA2-EFF	CIA2-EFF-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA1-EFF	CIA1-EFF-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-69A	N	10/08/2019	Process Water	0	0

TABLE 1
Sampling Progress: 1 October to 31 October 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
Central Impact Area	CIA1-MID1	CIA1-MID1-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-69A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA3-EFF	CIA3-EFF-40A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-40A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-40A	N	10/08/2019	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-40A	N	10/08/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-133A	N	10/07/2019	Process Water	0	0
J1 Range Southern	MW-400M2	MW-400M2_F19	N	10/07/2019	Ground Water	138.9	148.9
J2 Range Eastern	J2E-INF-J	J2E-INF-J-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-133A	N	10/07/2019	Process Water	0	0
J1 Range Southern	MW-400M1	MW-400M1_F19	N	10/07/2019	Ground Water	192.76	202.75
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-133A	N	10/07/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-133A	N	10/07/2019	Process Water	0	0
J3 Range	J3-EFF	J3-EFF-157A	N	10/03/2019	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-157A	N	10/03/2019	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-157A	N	10/03/2019	Process Water	0	0
J3 Range	J3-INF	J3-INF-157A	N	10/03/2019	Process Water	0	0
Demolition Area 1	PR-EFF	PR-EFF-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	PR-MID-2	PR-MID-2-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	PR-MID-1	PR-MID-1-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	PR-INF	PR-INF-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-163A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1LE-EFF	D1LE-EFF-39A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1LE-MID2	D1LE-MID2-39A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-39A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-39A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1-EFF	D1-EFF-111A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-111A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-111A	N	10/03/2019	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-111A	N	10/03/2019	Process Water	0	0
Central Impact Area	MW-623M3	MW-623M3_F19	N	10/02/2019	Ground Water	275	285
J1 Range Southern	J1S-EFF	J1S-EFF-143A	N	10/02/2019	Process Water	0	0
J1 Range Southern	J1S-MID	J1S-MID-143A	N	10/02/2019	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-143A	N	10/02/2019	Process Water	0	0
Central Impact Area	MW-623M2	MW-623M2_F19	N	10/02/2019	Ground Water	291.8	301.8
Central Impact Area	MW-623M1	MW-623M1_F19	N	10/02/2019	Ground Water	340	350
Central Impact Area	MW-624M2	MW-624M2_F19	N	10/01/2019	Ground Water	254	264
Central Impact Area	MW-624M1	MW-624M1_F19	N	10/01/2019	Ground Water	284	294
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-157A	N	10/01/2019	Process Water	0	0
J2 Range Northern	J2N-INF-F	J2N-INF-F-157A	N	10/01/2019	Process Water	0	0

TABLE 1
Sampling Progress: 1 October to 31 October 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
Central Impact Area	MW-710M1	MW-710M1_F19	N	10/01/2019	Ground Water	247.5	257.5
J1 Range Northern	J1N-EFF	J1N-EFF-72A	N	10/01/2019	Process Water	0	0
J1 Range Northern	J1N-MID2	J1N-MID2-72A	N	10/01/2019	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-72A	N	10/01/2019	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-72A	N	10/01/2019	Process Water	0	0
Central Impact Area	MW-617M1	MW-617M1_F19	N	10/01/2019	Ground Water	175.8	185.8

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 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
Central Impact Area	MW-625M1	MW-625M1_F19	260	270	10/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.50		µg/L	0.60		0.036	0.20
Central Impact Area	MW-699M1	MW-699M1_F19	261.5	271.5	10/09/2019	SW6850	Perchlorate	0.067	J	µg/L	2.0		0.027	0.20
Central Impact Area	MW-699M1	MW-699M1_F19	261.5	271.5	10/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.83		µg/L	0.60	X	0.036	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW8330	1,3,5-Trinitrobenzene	0.040	J	µg/L	1090		0.024	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW6850	Perchlorate	0.081	J	µg/L	2.0		0.027	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW8330	2,4-Dinitrotoluene	0.13	J	µg/L	5.0		0.054	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW8330	2-Amino-4,6-dinitrotoluene	0.21		µg/L	7.3		0.016	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.25		µg/L	7.3		0.015	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW8330	2,4,6-Trinitrotoluene	0.55		µg/L	2.0		0.027	0.20
Central Impact Area	MW-695S	MW-695S_F19	130	140	10/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.62	J	µg/L	0.60	X	0.036	0.20
Central Impact Area	MW-695S	MW-695S_F19D	130	140	10/09/2019	SW8330	1,3,5-Trinitrobenzene	0.047	J	µg/L	1090		0.024	0.20
Central Impact Area	MW-695S	MW-695S_F19D	130	140	10/09/2019	SW8330	2,4-Dinitrotoluene	0.13	J	µg/L	5.0		0.054	0.20
Central Impact Area	MW-695S	MW-695S_F19D	130	140	10/09/2019	SW8330	2-Amino-4,6-dinitrotoluene	0.20		µg/L	7.3		0.016	0.20
Central Impact Area	MW-695S	MW-695S_F19D	130	140	10/09/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.25		µg/L	7.3		0.015	0.20
Central Impact Area	MW-695S	MW-695S_F19D	130	140	10/09/2019	SW8330	2,4,6-Trinitrotoluene	0.55		µg/L	2.0		0.027	0.20
Central Impact Area	MW-695S	MW-695S_F19D	130	140	10/09/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.63	J	µg/L	0.60	X	0.036	0.20
J1 Range Southern	MW-360M2	MW-360M2_F19	102	112	10/08/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.13	J	µg/L	0.60		0.036	0.20
J1 Range Southern	MW-360M2	MW-360M2_F19	102	112	10/08/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.38		µg/L	400		0.025	0.20
J1 Range Southern	MW-400M1	MW-400M1_F19	192.76	202.75	10/07/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.18	J	µg/L	0.60		0.036	0.20
Central Impact Area	MW-623M3	MW-623M3_F19	275	285	10/02/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.13	J	µg/L	400		0.025	0.20
Central Impact Area	MW-623M3	MW-623M3_F19	275	285	10/02/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.17	J	µg/L	0.60		0.036	0.20
Central Impact Area	MW-623M2	MW-623M2_F19	291.8	301.8	10/02/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.087	J	µg/L	0.60		0.036	0.20
Central Impact Area	MW-623M1	MW-623M1_F19	340	350	10/02/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.064	J	µg/L	0.60		0.036	0.20
Central Impact Area	MW-710M1	MW-710M1_F19	247.5	257.5	10/01/2019	SW6850	Perchlorate	0.070	J	µg/L	2.0		0.027	0.20
Central Impact Area	MW-710M1	MW-710M1_F19	247.5	257.5	10/01/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.29		µg/L	0.60		0.036	0.20
Central Impact Area	MW-617M1	MW-617M1_F19	175.8	185.8	10/01/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.47		µg/L	0.60		0.036	0.20
Central Impact Area	MW-616M1	MW-616M1_F19	217.1	227.1	09/30/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.27		µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-319M1	MW-319M1_F19	200.25	210.25	09/30/2019	SW6850	Perchlorate	0.079	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-319M1	MW-319M1_F19	200.25	210.25	09/30/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.082	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-667M2	MW-667M2_F19	277.3	287.3	09/26/2019	SW6850	Perchlorate	0.46		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-667M2	MW-667M2_F19	277.3	287.3	09/26/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.69		µg/L	400		0.025	0.20
J2 Range Eastern	MW-667M2	MW-667M2_F19	277.3	287.3	09/26/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.7		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-667M2	MW-667M2_F19D	277.3	287.3	09/26/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.68		µg/L	400		0.025	0.20
J2 Range Eastern	MW-667M2	MW-667M2_F19D	277.3	287.3	09/26/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.7		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-667M1	MW-667M1_F19	302.3	312.3	09/26/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.52		µg/L	400		0.025	0.20
J2 Range Eastern	MW-667M1	MW-667M1_F19	302.3	312.3	09/26/2019	SW6850	Perchlorate	1.1		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-667M1	MW-667M1_F19	302.3	312.3	09/26/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.4		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-667M1	MW-667M1_F19D	302.3	312.3	09/26/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.54		µg/L	400		0.025	0.20
J2 Range Eastern	MW-667M1	MW-667M1_F19D	302.3	312.3	09/26/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.5		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-170M2	MW-170M2_F19	198	208	09/26/2019	SW6850	Perchlorate	0.12	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-170M1	MW-170M1_F19	265	275	09/26/2019	SW6850	Perchlorate	0.28		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-307M3	MW-307M3_F19	125.8	135.82	09/25/2019	SW6850	Perchlorate	1.2		µg/L	2.0		0.027	0.20

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

**TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 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 Eastern	MW-215M2	MW-215M2_F19	205	215	09/25/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.13	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-215M2	MW-215M2_F19	205	215	09/25/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.23		µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-215M2	MW-215M2_F19	205	215	09/25/2019	SW6850	Perchlorate	1.3		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-215M1	MW-215M1_F19	240	250	09/25/2019	SW6850	Perchlorate	0.80		µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-01M2	J2MW-01M2_F19	245	255	09/24/2019	SW6850	Perchlorate	1.4		µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-01M1	J2MW-01M1_F19	275	285	09/24/2019	SW6850	Perchlorate	0.060	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-01M1	J2MW-01M1_F19	275	285	09/24/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.064	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	J2MW-02PZ	J2MW-02PZ_F19	191	201	09/24/2019	SW6850	Perchlorate	0.095	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-02M2	J2MW-02M2_F19	236	246	09/24/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.092	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	J2MW-02M2	J2MW-02M2_F19	236	246	09/24/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.55		µg/L	400		0.025	0.20
J2 Range Eastern	J2MW-02M2	J2MW-02M2_F19	236	246	09/24/2019	SW6850	Perchlorate	1.7		µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-02M1	J2MW-02M1_F19	271	281	09/24/2019	SW6850	Perchlorate	0.52		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-321M2	MW-321M2_F19	155.67	165.67	09/23/2019	SW6850	Perchlorate	0.22		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-321M1	MW-321M1_F19	174.61	184.61	09/23/2019	SW6850	Perchlorate	0.28		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-335M2	MW-335M2_F19	215.25	225.25	09/23/2019	SW6850	Perchlorate	0.075	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-05M2	J2MW-05M2_F19	185	195	09/19/2019	SW6850	Perchlorate	0.060	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	J2MW-05M1	J2MW-05M1_F19	225	235	09/19/2019	SW6850	Perchlorate	0.076	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-665M3	MW-665M3_F19	175.2	185.2	09/19/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.16	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-665M3	MW-665M3_F19	175.2	185.2	09/19/2019	SW6850	Perchlorate	4.5		µg/L	2.0	X	0.027	0.20
J2 Range Eastern	MW-665M2	MW-665M2_F19	205.2	215.2	09/19/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.20		µg/L	400		0.025	0.20
J2 Range Eastern	MW-665M2	MW-665M2_F19	205.2	215.2	09/19/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.0		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-665M2	MW-665M2_F19	205.2	215.2	09/19/2019	SW6850	Perchlorate	3.8		µg/L	2.0	X	0.027	0.20
J2 Range Eastern	MW-665M2	MW-665M2_F19D	205.2	215.2	09/19/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.21		µg/L	400		0.025	0.20
J2 Range Eastern	MW-665M2	MW-665M2_F19D	205.2	215.2	09/19/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.0		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-665M2	MW-665M2_F19D	205.2	215.2	09/19/2019	SW6850	Perchlorate	3.9		µg/L	2.0	X	0.027	0.20
J2 Range Eastern	MW-665M1	MW-665M1_F19	225.2	235.2	09/19/2019	SW6850	Perchlorate	0.19	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-685M1	MW-685M1_F19	166.2	176.2	09/18/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.043	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-685M1	MW-685M1_F19	166.2	176.2	09/18/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.29		µg/L	400		0.025	0.20
J2 Range Eastern	MW-685M1	MW-685M1_F19	166.2	176.2	09/18/2019	SW6850	Perchlorate	0.42		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-668M1	MW-668M1_F19	168.7	178.7	09/18/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.48		µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-668M1	MW-668M1_F19	168.7	178.7	09/18/2019	SW6850	Perchlorate	27.5		µg/L	2.0	X	0.27	2.0
J2 Range Eastern	MW-668M1	MW-668M1_F19D	168.7	178.7	09/18/2019	SW6850	Perchlorate	27.6		µg/L	2.0	X	0.27	2.0
J2 Range Eastern	MW-666M3	MW-666M3_F19	199.8	209.8	09/18/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.072	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-666M3	MW-666M3_F19	199.8	209.8	09/18/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.11	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-666M3	MW-666M3_F19	199.8	209.8	09/18/2019	SW6850	Perchlorate	1.2		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-666M2	MW-666M2_F19	219.8	229.8	09/18/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.051	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-666M2	MW-666M2_F19	219.8	229.8	09/18/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.16	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-666M2	MW-666M2_F19	219.8	229.8	09/18/2019	SW6850	Perchlorate	1.1		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-666M1	MW-666M1_F19	244.8	254.8	09/18/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.072	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-666M1	MW-666M1_F19	244.8	254.8	09/18/2019	SW6850	Perchlorate	3.7		µg/L	2.0	X	0.027	0.20
J2 Range Eastern	MW-666M1	MW-666M1_F19D	244.8	254.8	09/18/2019	SW6850	Perchlorate	3.7		µg/L	2.0	X	0.027	0.20
J2 Range Northern	J2EW0003	J2EW0003_F19	202	232	09/18/2019	SW6850	Perchlorate	0.36		µg/L	2.0		0.027	0.20

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

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 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 Eastern	MW-365M2	MW-365M2_F19	205.52	215.52	09/17/2019	SW6850	Perchlorate	0.079	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-366M2	MW-366M2_F19	175	185	09/17/2019	SW6850	Perchlorate	0.073	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-366M1	MW-366M1_F19	215	225	09/17/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.12	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-366M1	MW-366M1_F19	215	225	09/17/2019	SW6850	Perchlorate	1.7		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-708S	MW-708S_F19	107.7	117.7	09/17/2019	SW6850	Perchlorate	0.067	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-707S	MW-707S_F19	110.3	120.3	09/16/2019	SW6850	Perchlorate	0.052	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-707S	MW-707S_F19	110.3	120.3	09/16/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.084	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-707S	MW-707S_F19	110.3	120.3	09/16/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.32		µg/L	0.60		0.036	0.20
J2 Range Eastern	MW-706S	MW-706S_F19	112.7	122.7	09/16/2019	SW6850	Perchlorate	0.13	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-709S	MW-709S_F19	106.2	116.2	09/16/2019	SW6850	Perchlorate	0.10	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-705M2	MW-705M2_F19	185.9	195.9	09/16/2019	SW6850	Perchlorate	0.053	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-339M2	MW-339M2_F19	213	223	09/12/2019	SW6850	Perchlorate	0.058	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-339M1	MW-339M1_F19	233	243	09/12/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.12	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-339M1	MW-339M1_F19	233	243	09/12/2019	SW6850	Perchlorate	0.45		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-393M2	MW-393M2_F19	218.16	228.16	09/12/2019	SW6850	Perchlorate	0.055	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-393M1	MW-393M1_F19	268.02	278.02	09/12/2019	SW6850	Perchlorate	0.045	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-393D	MW-393D_F19	313.56	323.56	09/12/2019	SW6850	Perchlorate	0.038	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-368M3	MW-368M3_F19	155.5	165.5	09/11/2019	SW6850	Perchlorate	0.066	J	µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-368M2	MW-368M2_F19	202.73	212.73	09/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	4.6		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-368M2	MW-368M2_F19	202.73	212.73	09/11/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	8.2		µg/L	400		0.025	0.20
J2 Range Eastern	MW-368M2	MW-368M2_F19	202.73	212.73	09/11/2019	SW6850	Perchlorate	9.0		µg/L	2.0	X	0.027	0.20
J2 Range Eastern	MW-368M2	MW-368M2_F19D	202.73	212.73	09/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	4.4		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-368M2	MW-368M2_F19D	202.73	212.73	09/11/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	8.2		µg/L	400		0.025	0.20
J2 Range Eastern	MW-368M2	MW-368M2_F19D	202.73	212.73	09/11/2019	SW6850	Perchlorate	9.0		µg/L	2.0	X	0.027	0.20
J2 Range Eastern	MW-368M1	MW-368M1_F19	237.35	247.35	09/11/2019	SW6850	Perchlorate	38.2		µg/L	2.0	X	0.27	2.0
J2 Range Eastern	MW-368M1	MW-368M1_F19	237.35	247.35	09/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	4.1		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-368M1	MW-368M1_F19D	237.35	247.35	09/11/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	3.8		µg/L	0.60	X	0.036	0.20
J2 Range Eastern	MW-368M1	MW-368M1_F19D	237.35	247.35	09/11/2019	SW6850	Perchlorate	37.8		µg/L	2.0	X	0.27	2.0
J2 Range Eastern	MW-324M2	MW-324M2_F19	203.74	214.74	09/11/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.35	J	µg/L	400		0.025	0.20
J2 Range Eastern	MW-324M2	MW-324M2_F19	203.74	214.74	09/11/2019	SW6850	Perchlorate	0.54		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-324M1	MW-324M1_F19	234.85	244.85	09/11/2019	SW6850	Perchlorate	0.36		µg/L	2.0		0.027	0.20
J2 Range Eastern	MW-324M1	MW-324M1_F19	234.85	244.85	09/11/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.42		µg/L	400		0.025	0.20
J2 Range Eastern	J2MW-04M1	J2MW-04M1_F19	257	267	09/10/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.047	J	µg/L	0.60		0.036	0.20
J2 Range Eastern	J2MW-04M1	J2MW-04M1_F19	257	267	09/10/2019	SW6850	Perchlorate	0.12	J	µg/L	2.0		0.027	0.20
J2 Range Northern	MW-305M1	MW-305M1_F19	202.82	212.82	09/10/2019	SW6850	Perchlorate	0.053	J	µg/L	2.0		0.027	0.20
J2 Range Northern	MW-340M1	MW-340M1_F19	255.85	265.85	09/10/2019	SW6850	Perchlorate	0.044	J	µg/L	2.0		0.027	0.20
J2 Range Northern	J2EW3-MW-2-C	J2EW3-MW-2-C_F19	251.13	261.13	09/09/2019	SW6850	Perchlorate	0.063	J	µg/L	2.0		0.027	0.20
J2 Range Northern	J2EW2-MW2-B	J2EW2-MW2-B_F19	209.79	219.79	09/09/2019	SW6850	Perchlorate	0.040	J	µg/L	2.0		0.027	0.20
J2 Range Northern	J2EW2-MW2-C	J2EW2-MW2-C_F19	243.83	253.81	09/09/2019	SW6850	Perchlorate	0.43		µg/L	2.0		0.027	0.20
J2 Range Northern	MW-322M1	MW-322M1_F19	245.77	255.77	09/04/2019	SW6850	Perchlorate	0.21		µg/L	2.0		0.027	0.20
J2 Range Northern	MW-293M2	MW-293M2_F19	196.42	206.42	09/04/2019	SW6850	Perchlorate	0.22		µg/L	2.0		0.027	0.20
J2 Range Northern	MW-586M2	MW-586M2_F19	211	221	09/04/2019	SW6850	Perchlorate	0.27		µg/L	2.0		0.027	0.20

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

**TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 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-586M1	MW-586M1_F19	237	247	09/04/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.083	J	µg/L	0.60		0.036	0.20
J2 Range Northern	MW-586M1	MW-586M1_F19	237	247	09/04/2019	SW6850	Perchlorate	9.0		µg/L	2.0	X	0.027	0.20
J2 Range Northern	MW-586M1	MW-586M1_F19D	237	247	09/04/2019	SW6850	Perchlorate	8.8		µg/L	2.0	X	0.027	0.20
J2 Range Northern	J2EW1-MW1-B	J2EW1-MW1-B_F19	205.82	215.82	09/03/2019	SW6850	Perchlorate	0.076	J	µg/L	2.0		0.027	0.20
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_F19	240.8	250.8	09/03/2019	SW6850	Perchlorate	4.7		µg/L	2.0	X	0.027	0.20
J2 Range Northern	MW-313M3	MW-313M3_F19	195.07	205.57	09/03/2019	SW6850	Perchlorate	0.047	J	µg/L	2.0		0.027	0.20
J2 Range Northern	MW-313M2	MW-313M2_F19	215.46	225.49	09/03/2019	SW6850	Perchlorate	0.073	J	µg/L	2.0		0.027	0.20
J2 Range Northern	MW-313M1	MW-313M1_F19	255.42	265.42	09/03/2019	SW6850	Perchlorate	3.5		µg/L	2.0	X	0.027	0.20
J2 Range Northern	MW-313M1	MW-313M1_F19D	255.42	265.42	09/03/2019	SW6850	Perchlorate	3.5		µg/L	2.0	X	0.027	0.20

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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	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

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	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

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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 (PFTrDA)	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

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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	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

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

KGS 2019 PFAS MW&INF

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	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

PFAS Summary Report – Groundwater

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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

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

KGS 2019 PFAS MW&INF

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_PFA19	J2N-INF-F_PFA19	J2N-INF-F_PFA19R	J2N-INF-G_PFA19	MW-234M2_PFA19	MW-313M1_PFA19
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	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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Joint Base Cape Cod, IAGWSP

Location	J2N-INF-E	J2N-INF-F	J2N-INF-F	J2N-INF-G	MW-234M2	MW-313M1
Field Sample ID	J2N-INF-E_PFA19	J2N-INF-F_PFA19	J2N-INF-F_PFA19R	J2N-INF-G_PFA19	MW-234M2_PFA19	MW-313M1_PFA19
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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KGS 2019 PFAS MW&INF

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	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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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	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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Location	J3-INF	J3-INF	MW-163S	MW-163S	MW-163S	MW-227M2
Field Sample ID	J3-INF_PFAS19	J3-INF_PFAS19D	MW-163S_PFAS19	MW-163S_PFAS19D	MW-163S_PFAS19R	MW-227M2_PFAS19
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 (PFTrDA)	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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KGS 2019 PFAS MW&INF

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	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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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