MONTHLY PROGRESS REPORT #270
FOR SEPTEMBER 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 September to 30 September 2019.

1. SUMMARY OF REMEDIATION ACTIONS

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of September 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 2.676 billion gallons of water treated and re-injected as of 27 September 2019. The following shutdown(s) of the Frank Perkins Road Treatment Facility occurred during September:

- The Frank Perkins Treatment Facility shut down due to a planned JBCC power outage. The facility shut down at 0745 h on 4 September 2019 and was restarted at 0730 h on 5 September 2019.
- The Frank Perkins Treatment Facility shut down due to a JBCC power supply interruption. The facility shut down at 1500 h on 29 September 2019 and was restarted at 0720 h on 30 September 2019.

The Pew Road Mobile Treatment Unit (MTU) continues to operate at a flow rate of 65 GPM, with over 626.2 million gallons of water treated and re-injected as of 27 September 2019. The following shutdown(s) of the Pew Road MTU occurred during September:

- The Pew Road MTU shut down due to a planned JBCC power outage. The MTU shut down at 0745 h on 4 September 2019 and was restarted at 0827 h on 5 September 2019.
- The Pew Road MTU shut down due to a power supply interruption. The MTU shut down at 1138 h on 11 September 2019 and was restarted at 1240 h on 11 September 2019.
- The Pew Road MTU shut down due to a power supply interruption. The MTU shut down at 1510 h on 11 September 2019 and was restarted at 0730 h on 12 September 2019.
- The Pew Road MTU was turned off for an IX resin exchange. The MTU was turned off at 1100 h on 17 September 2019, CFS performed the exchange on 18 September 2019, and the MTU was restarted at 0745 h on 19 September 2019.
- The Pew Road MTU shut down due to a JBCC power supply interruption. The MTU shut down at 1500 h on 29 September 2019 and was restarted at 0940 h on 30 September 2019.

The Base Boundary MTU continues to operate at a flow rate of 65 gpm, with over 241.9 million gallons of water treated and re-injected as of 27 September 2019. No shutdown(s) of the Base Boundary MTU occurred during September.

The Leading Edge system continues to operate at a flow rate of 100 gpm, with over 165.4 million gallons of water treated and re-injected as of 27 September 2019. No shutdown(s) of the Leading Edge system occurred during September.

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 27 September 2019, over 1.166 billion gallons of water have been treated and re-injected. No shutdown(s) of the Northern Treatment Building occurred in September.

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 27 September 2019, over 1.619 billion gallons of water have been treated and re-injected. The following shutdown(s) of the J-2 Range Northern system occurred during September:

- MTU F shut down at 0420 h on 4 September 2019, due to a “Floor sump high” alarm due to a leaking air bleed valve in MTU E. The MTU was restarted at 0806 h on 4 September 2019.
- MTU F shut down without an alarm. The MTU shut down at 1242 h on 4 September 2019 and was restarted at 0810 h on 5 September 2019.
- MTU F shut down at 1857 h on 5 September 2019, due to a “Floor sump high” alarm due to a leaking air bleed valve in MTU E. The floor sump alarm has been disabled and MTU E GAC vessels 5 and 6 were drained to prevent future shutdowns. The MTU was restarted at 0755 h on 6 September 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 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 on 27 August 2019 and the remaining resin was installed on 18 September 2019. The two former IX resin vessels were removed on 30 September 2019 to be repaired off-post and filled with GAC media. The MTU will remain off pending installation of those two vessels (the fresh resin was installed in the first two formally GAC vessels nearest the influent).

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 27 September 2019, over 1.277 billion gallons of water have been treated and re-injected. No shutdown(s) of MTUs H and I occurred during September.

MTU J continues to operate at a flow rate of 120 gpm. As of 27 September 2019, over 582.7 million gallons of water have been treated and re-injected. The following shutdown(s) of MTU J occurred during September:

- MTU J was turned off to replace ball valves, camlock fittings, and hoses. The MTU was turned off at 0845 h on 27 September 2019 and was restarted at 1000 h on 27 September 2019.

MTU K continues to operate at a flow rate of 125 gpm. As of 27 September 2019, over 699.5 million gallons of water have been treated and re-injected. No shutdown(s) of MTU K occurred during September.

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 27 September 2019, over 1.282 billion gallons of water have been treated and re-injected. The following shutdown(s) of the J-3 Range system occurred during September:

- The system shut down due to an FS-12 shutdown. The system shut down at 1500 h on 4 September 2019 and was restarted at 0805 h on 5 September 2019.
- The system shut down due to an FS-12 shutdown. The system shut down at 1838 h on 5 September 2019 and was restarted at 0839 h on 6 September 2019.
- The System shut down due to a power supply interruption. The System shut down at 2258 h on 14 September 2019 and was restarted at 0831 h on 16 September 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 27 September 2019, over 560.9 million gallons of water have been treated and re-injected. No shutdown(s) of the J-1 Range Southern system occurred during September.

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 27 September 2019, over 750.5 million gallons of water have been treated and re-injected. No shutdown(s) of the J-1 Range Northern MTU occurred during September.

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 27 September 2019, over 1.832 billion gallons of water have been treated and re-injected. The following shutdown(s) of the CIA treatment facility occurred during September:

- 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 was restarted at 0748 h on 3 September 2019.
- The CIA1 MTU shut down due to a planned JBCC power outage. The MTU shut down at 0745 h on 4 September 2019 and was restarted at 1600 h on 4 September 2019.
- The CIA2 MTU shut down due to a planned JBCC power outage. The MTU shut down at 0745 h on 4 September 2019 and was restarted at 0955 h on 5 September 2019.
- The CIA2 MTU shut down due to a JBCC power supply interruption. The MTU shut down at 1500 h on 29 September 2019 and was restarted at 0902 h on 30 September 2019.

SUMMARY OF ACTIONS TAKEN

CIA

- Performed routine inspections of BEM cover to ensure cover is secure and intact.
- Performed demo operations.
- Performed intrusive investigation P3A2.
- Groundwater sampling within CIA SPM program.

Demolition Area 1

- Exchanged bag filters at Leading Edge MTU on 6 September 2019.
- Exchanged bag filters at Pew Road MTU on 13 September 2019.
- Exchanged bag filters at Leading Edge MTU on 23 September 2019.

Demolition Area 2

- No activity.

Small Arms Ranges

- Completed hydro-seeding at B, C, and G Ranges.
- Began hydro-seeding at Former B and D Ranges.
- Grading and gravel installation at D Range.
- Installation of retaining wall at D Range.

J-1 Range
- Hydraulic monitoring within J1 South SPM program.

J-2 Range
- Hydraulic monitoring within J2 East SPM program.
- Groundwater sampling within J2 North SPM program.
- Groundwater sampling within J2 East SPM program.
- Exchanged bag filters at Building G on 17 September 2019.

J-3 Range
- Exchanged bag filters on 17 September 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 J2 Range Eastern and J2 Range Northern.

JBCC IAGWSP Tech Update Meeting Minutes 12 September 2019

Project and Fieldwork Update
Long term groundwater monitoring is underway at the J-2 North Range; the team will move to the J-2 East Range next. All treatment systems are up and running with the exception of EW-1 at J-2 North MTU E. After inspecting the hole in the ion exchange vessel, it was determined that both IX vessels need to be replaced. They can run the system with two vessels while the others get repaired. It will take approximately 5-6 weeks to get the system back up and running with its current configuration. IAGWSP will draft a project note documenting the proposed fix/way forward. The contract has been awarded for the drive points at the Pocasset Baptist Church and they will be scheduled soon. The J-1 South wells have been installed and sampled; data is expected soon.

In the Small Arms Ranges, they are finishing up site improvement fieldwork, repairing areas of erosion caused by last week's storm, and prepping the D Range for installation of the retaining wall. Hydro seeding in B, Former B, C, D, and G Ranges is scheduled to begin Friday. D Range gravel installation and guardrail installation at B, C, and D Ranges is scheduled for the week of the 22nd. All Small Arms Ranges work should be complete the first week of October, weather permitting, and a completion of work report is pending.

In the Training Areas, the Dawson contract has been awarded and they are preparing work plans. The contract is primarily for work at the Former E Range (20 acres of geophysical and digs). The contract also includes one grid at the KD Range and four grids at the J-3 Range. Finally, the contract includes an acre of vegetation clearance (roads, well pads and downhole) for monitoring wells.

In the Central Impact Area, there is one Metal Mapper team working in Area II; they expect to be completed sometime in October. All the digging in Phase III Area 1 is complete and the teams are focused in Area 2; the digs should be done in mid-November. Phase III Area 1 annual report was revised to include that re-digs be submitted to the agencies in October. MassDEP noted that in a meeting with Fisheries and Wildlife there was a concern that there might be potential conflicts with upcoming hunting events and transect work in the CIA. They were concerned that the stand-off distance at the end of the transects could possibly interfere with the hunt. They asked IAGWSP to coordinate with them to try and avoid any conflicts. IAGWPS will follow-up with natural resources personnel to get a map and review it with Parsons to try to avoid any issues.

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 grid (21_59) 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 21_59. There were 129 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 33 met the dig criteria resulting in a recommended dig rate of 25.6%. The remaining 96 anomalies were dug for QA. Eleven TOI (UXO or UXO-like items) were recovered. For the classification results, 95 clutter items were correctly classified, 19.49% of the clutter was incorrectly classified as “likely- TOI” therefore meeting the goal of reduction of clutter digs by 70%.

The incorrect classification was caused by the nature of the clutter - large amounts of metal debris throughout grid, which can overwhelm the model. The clutter dig rate is unavoidable in the conditions of this grid. It was noted that a total of three UXO items, five UXO-like items, and two seed items were correctly classified.

The current status and path forward was reviewed. In Phase III Area 1, the re-digs are complete through ACE QA. The initial MetalMapper data collection in Phase III Area 2 is complete. There are some re-shoots needed in survey units 4 and 5; they will be collected upon completion of initial data processing/analysis (estimated mid-October). The cued data for survey units 1, 2, and 3 were approved by USACE. Survey unit 4 analysis is complete except for necessary reshoots, and analysis of survey unit 5 is ongoing. All validation grids have been selected and excavation of EM61 targets in validation grids will be performed as soon as AGC digs in those grids are complete. Phase III Area 2 digs are expected to be complete in late November. A status map showing work conducted as of August 2019 was displayed.

JBCC IAGWSP Tech Update Meeting Minutes 26 September 2019

Project and Fieldwork Update

Long term groundwater monitoring is underway at the J-2 East Range. The contract has been awarded for the drive points at the Pocasset Baptist Church, work and safety plans are pending approval, and they are tentatively scheduled to begin by end of October. All treatment systems are up and running with the exception of EW-1 at J-2 North MTU E. On 30 September, the two damaged vessels will be removed. It is anticipated to take two to three weeks to complete repairs. While the vessels are out of the container, the floor will be inspected.

In the Small Arms Ranges, they are continuing with site improvement fieldwork. The D Range retaining wall is almost complete. Hydro seeding was completed at B Range, C Range, and G Range. Former C Range was hand seeded because they were unable to get the equipment up the road. The gravel path to E Range will be done early next week, and D Range gravel and guardrail will be installed over the next two weeks.

In the Training Areas, the Dawson's initial schedule has them excavating the primary target area during December, then begin geophysical surveys at Former E Range and J-3 Range in January 2020.

In the Central Impact Area, there was no activity this week due to range firing. The team completed Phase III Area 2 Metal Mapping last week, but there are some additional re-collects. They completed digs in Phase III Area 1 a couple of weeks ago and are continuing with digs in Phase III Area 2. They are still on track to complete all digs by mid-November. IAGWSP noted that they recently had an intern with USACE count the craters from the LIDAR imaging, and they are currently working on a table that has the number of craters per grid and a figure showing the contouring of craters per grid.

IAGWSP noted that as the team performs its UXO removal work along the transects, they may be able to determine a correlation between the number of UXO and the number of craters. IAGWSP will forward the information on to the agencies. MassDEP noted that in a meeting with Fisheries and Wildlife, there was a concern that there might be potential conflicts with upcoming hunting events and transect work in the CIA. They were concerned that the stand-off distance at the end of the transects could possibly interfere with the hunt. They asked IAGWSP to coordinate with them to try and avoid any conflicts. IAGWPS will follow-up with natural resources personnel to get a map and review it with Parsons to try to avoid any issues.

MassDEP noted that Natural Resources staff were interested in the overall plan for Former E Range. They are performing advance work for the MPMG Range and the safety danger range goes across Former E Range. They will be cutting firebreaks and are concerned about the level of munitions removal in that area. MassDEP will set up a meeting to discuss.

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 September to 30 September 2019. Table 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 1 September to 30 September 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. 269 for August 2019	10 September 2019
• Draft Demolition Area 2 2019 Annual Environmental Monitoring Report	13 September 2019
• Draft Demolition Area 1 2019 Annual Environmental Monitoring Report	16 September 2019
• Draft Northwest Corner 2019 Annual Environmental Monitoring Report	20 September 2019
• Post DD Confirmatory Geophysical and Soil Investigation at J-2 Range Phase 2 Findings Final Project Note	30 September 2019

3. SCHEDULED ACTIONS

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

- 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
- Updated 2018 Source Report to include re-digs
- Five Year Review Report
- Certificate of Compliance for Western Boundary
- Joint IAGWSP/IRP program fact sheet

TABLE 1
Sampling Progress: 1 September to 30 September 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 Eastern	MW-667M2	MW-667M2_F19	N	09/26/2019	Ground Water	277.3	287.3
J2 Range Eastern	MW-667M2	MW-667M2_F19D	FD	09/26/2019	Ground Water	277.3	287.3
J2 Range Eastern	MW-667M1	MW-667M1_F19	N	09/26/2019	Ground Water	302.3	312.3
J2 Range Eastern	MW-667M1	MW-667M1_F19D	FD	09/26/2019	Ground Water	302.3	312.3
J2 Range Eastern	MW-170M2	MW-170M2_F19	N	09/26/2019	Ground Water	198	208
J2 Range Eastern	MW-170M1	MW-170M1_F19	N	09/26/2019	Ground Water	265	275
J2 Range Eastern	MW-307M3	MW-307M3_F19	N	09/25/2019	Ground Water	125.8	135.82
J2 Range Eastern	MW-215M2	MW-215M2_F19	N	09/25/2019	Ground Water	205	215
J2 Range Eastern	MW-215M1	MW-215M1_F19	N	09/25/2019	Ground Water	240	250
J2 Range Eastern	J2MW-01M2	J2MW-01M2_F19	N	09/24/2019	Ground Water	245	255
J2 Range Eastern	J2MW-01M1	J2MW-01M1_F19	N	09/24/2019	Ground Water	275	285
J2 Range Eastern	J2MW-02PZ	J2MW-02PZ_F19	N	09/24/2019	Ground Water	191	201
J2 Range Eastern	J2MW-02M2	J2MW-02M2_F19	N	09/24/2019	Ground Water	236	246
J2 Range Eastern	J2MW-02M1	J2MW-02M1_F19	N	09/24/2019	Ground Water	271	281
J2 Range Eastern	MW-321M2	MW-321M2_F19	N	09/23/2019	Ground Water	155.67	165.67
J2 Range Eastern	MW-321M1	MW-321M1_F19	N	09/23/2019	Ground Water	174.61	184.61
J2 Range Eastern	MW-335M2	MW-335M2_F19	N	09/23/2019	Ground Water	215.25	225.25
J2 Range Eastern	MW-335M1	MW-335M1_F19	N	09/23/2019	Ground Water	255.2	265.2
J2 Range Eastern	J2MW-05M2	J2MW-05M2_F19	N	09/19/2019	Ground Water	185	195
J2 Range Eastern	J2MW-05M1	J2MW-05M1_F19	N	09/19/2019	Ground Water	225	235
J2 Range Eastern	MW-665M3	MW-665M3_F19	N	09/19/2019	Ground Water	175.2	185.2
J2 Range Eastern	MW-665M2	MW-665M2_F19	N	09/19/2019	Ground Water	205.2	215.2
J2 Range Eastern	MW-665M2	MW-665M2_F19D	FD	09/19/2019	Ground Water	205.2	215.2
J2 Range Eastern	MW-665M1	MW-665M1_F19	N	09/19/2019	Ground Water	225.2	235.2
J2 Range Eastern	MW-685M1	MW-685M1_F19	N	09/18/2019	Ground Water	166.2	176.2
J2 Range Eastern	MW-668M1	MW-668M1_F19	N	09/18/2019	Ground Water	168.7	178.7
J2 Range Eastern	MW-668M1	MW-668M1_F19D	FD	09/18/2019	Ground Water	168.7	178.7
J2 Range Eastern	MW-666M3	MW-666M3_F19	N	09/18/2019	Ground Water	199.8	209.8
J2 Range Eastern	MW-666M2	MW-666M2_F19	N	09/18/2019	Ground Water	219.8	229.8
J2 Range Eastern	MW-666M1	MW-666M1_F19	N	09/18/2019	Ground Water	244.8	254.8
J2 Range Eastern	MW-666M1	MW-666M1_F19D	FD	09/18/2019	Ground Water	244.8	254.8
J2 Range Northern	J2EW0003	J2EW0003_F19	N	09/18/2019	Ground Water	202	232
J2 Range Eastern	MW-365M2	MW-365M2_F19	N	09/17/2019	Ground Water	205.52	215.52
J2 Range Eastern	MW-436M1	MW-436M1_F19	N	09/17/2019	Ground Water	295.47	305.47
J2 Range Eastern	MW-366M2	MW-366M2_F19	N	09/17/2019	Ground Water	175	185
J2 Range Eastern	MW-366M1	MW-366M1_F19	N	09/17/2019	Ground Water	215	225
J2 Range Eastern	MW-708S	MW-708S_F19	N	09/17/2019	Ground Water	107.7	117.7
J2 Range Eastern	MW-707S	MW-707S_F19	N	09/16/2019	Ground Water	110.3	120.3
J2 Range Eastern	MW-706S	MW-706S_F19	N	09/16/2019	Ground Water	112.7	122.7
J2 Range Eastern	MW-709S	MW-709S_F19	N	09/16/2019	Ground Water	106.2	116.2
J2 Range Eastern	MW-705M2	MW-705M2_F19	N	09/16/2019	Ground Water	185.9	195.9
J2 Range Eastern	MW-705M1	MW-705M1_F19	N	09/16/2019	Ground Water	209.7	219.7
J2 Range Eastern	MW-339M2	MW-339M2_F19	N	09/12/2019	Ground Water	213	223
J2 Range Eastern	MW-339M1	MW-339M1_F19	N	09/12/2019	Ground Water	233	243
J2 Range Eastern	MW-393M2	MW-393M2_F19	N	09/12/2019	Ground Water	218.16	228.16
J2 Range Eastern	MW-393M1	MW-393M1_F19	N	09/12/2019	Ground Water	268.02	278.02
J2 Range Eastern	MW-393D	MW-393D_F19	N	09/12/2019	Ground Water	313.56	323.56
J2 Range Eastern	MW-368M3	MW-368M3_F19	N	09/11/2019	Ground Water	155.5	165.5
J2 Range Eastern	MW-368M2	MW-368M2_F19	N	09/11/2019	Ground Water	202.73	212.73
J2 Range Eastern	MW-368M2	MW-368M2_F19D	FD	09/11/2019	Ground Water	202.73	212.73
J2 Range Eastern	MW-368M1	MW-368M1_F19	N	09/11/2019	Ground Water	237.35	247.35
J2 Range Eastern	MW-368M1	MW-368M1_F19D	FD	09/11/2019	Ground Water	237.35	247.35
J2 Range Eastern	MW-324M2	MW-324M2_F19	N	09/11/2019	Ground Water	203.74	214.74
J2 Range Northern	MW-324M2	MW-324M2_F19	N	09/11/2019	Ground Water	203.74	214.74
J2 Range Eastern	MW-324M1	MW-324M1_F19	N	09/11/2019	Ground Water	234.85	244.85
J2 Range Eastern	J2MW-04M2	J2MW-04M2_F19	N	09/10/2019	Ground Water	210	220
J2 Range Eastern	J2MW-04M1	J2MW-04M1_F19	N	09/10/2019	Ground Water	257	267
J2 Range Northern	MW-305M1	MW-305M1_F19	N	09/10/2019	Ground Water	202.82	212.82

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 September to 30 September 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-340M2	MW-340M2_F19	N	09/10/2019	Ground Water	215.83	225.08
J2 Range Northern	MW-340M1	MW-340M1_F19	N	09/10/2019	Ground Water	255.85	265.85
J2 Range Northern	J2EW3-MW-2-B	J2EW3-MW-2-B_F19	N	09/09/2019	Ground Water	216.16	226.16
J1 Range Southern	J1S-EFF	J1S-EFF-142A	N	09/09/2019	Process Water	0	0
J1 Range Southern	J1S-MID	J1S-MID-142A	N	09/09/2019	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-142A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2EW3-MW-2-C	J2EW3-MW-2-C_F19	N	09/09/2019	Ground Water	251.13	261.13
J2 Range Northern	J2EW2-MW2-B	J2EW2-MW2-B_F19	N	09/09/2019	Ground Water	209.79	219.79
J3 Range	J3-EFF	J3-EFF-156A	N	09/09/2019	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-156A	N	09/09/2019	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-156A	N	09/09/2019	Process Water	0	0
J3 Range	J3-INF	J3-INF-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2EW2-MW2-C	J2EW2-MW2-C_F19	N	09/09/2019	Ground Water	243.83	253.81
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-EFF-F	J2N-EFF-F-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-156A	N	09/09/2019	Process Water	0	0
J2 Range Northern	J2N-INF-F	J2N-INF-F-156A	N	09/09/2019	Process Water	0	0
J1 Range Northern	J1N-EFF	J1N-EFF-71A	N	09/09/2019	Process Water	0	0
J1 Range Northern	J1N-MID2	J1N-MID2-71A	N	09/09/2019	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-71A	N	09/09/2019	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-71A	N	09/09/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-J	J2E-INF-J-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-132A	N	09/05/2019	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-132A	N	09/05/2019	Process Water	0	0
Central Impact Area	CIA3-EFF	CIA3-EFF-39A	N	09/05/2019	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-39A	N	09/05/2019	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-39A	N	09/05/2019	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-39A	N	09/05/2019	Process Water	0	0
J2 Range Northern	MW-322M1	MW-322M1_F19	N	09/04/2019	Ground Water	245.77	255.77
J2 Range Northern	MW-293M2	MW-293M2_F19	N	09/04/2019	Ground Water	196.42	206.42
J2 Range Northern	MW-586M2	MW-586M2_F19	N	09/04/2019	Ground Water	211	221
J2 Range Northern	MW-586M1	MW-586M1_F19	N	09/04/2019	Ground Water	237	247
J2 Range Northern	MW-586M1	MW-586M1_F19D	FD	09/04/2019	Ground Water	237	247
J2 Range Northern	J2EW1-MW1-B	J2EW1-MW1-B_F19	N	09/03/2019	Ground Water	205.82	215.82
Central Impact Area	CIA2-EFF	CIA2-EFF-68A	N	09/03/2019	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-68A	N	09/03/2019	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-68A	N	09/03/2019	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-68A	N	09/03/2019	Process Water	0	0
Central Impact Area	CIA1-EFF	CIA1-EFF-68A	N	09/03/2019	Process Water	0	0
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_F19	N	09/03/2019	Ground Water	240.8	250.8
Central Impact Area	CIA1-MID2	CIA1-MID2-68A	N	09/03/2019	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-68A	N	09/03/2019	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-68A	N	09/03/2019	Process Water	0	0

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 September to 30 September 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
Demolition Area 1	D1LE-EFF	D1LE-EFF-38A	N	09/03/2019	Process Water	0	0
Demolition Area 1	D1LE-MID2	D1LE-MID2-38A	N	09/03/2019	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-38A	N	09/03/2019	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-38A	N	09/03/2019	Process Water	0	0
Demolition Area 1	D1-EFF	D1-EFF-110A	N	09/03/2019	Process Water	0	0
J2 Range Northern	MW-313M3	MW-313M3_F19	N	09/03/2019	Ground Water	195.07	205.57
Demolition Area 1	D1-MID-2	D1-MID-2-110A	N	09/03/2019	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-110A	N	09/03/2019	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-110A	N	09/03/2019	Process Water	0	0
Demolition Area 1	PR-EFF	PR-EFF-162A	N	09/03/2019	Process Water	0	0
Demolition Area 1	PR-MID-2	PR-MID-2-162A	N	09/03/2019	Process Water	0	0
Demolition Area 1	PR-MID-1	PR-MID-1-162A	N	09/03/2019	Process Water	0	0
Demolition Area 1	PR-INF	PR-INF-162A	N	09/03/2019	Process Water	0	0
J2 Range Northern	MW-313M2	MW-313M2_F19	N	09/03/2019	Ground Water	215.46	225.49
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-162A	N	09/03/2019	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-162A	N	09/03/2019	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-162A	N	09/03/2019	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-162A	N	09/03/2019	Process Water	0	0
J2 Range Northern	MW-313M1	MW-313M1_F19	N	09/03/2019	Ground Water	255.42	265.42
J2 Range Northern	MW-313M1	MW-313M1_F19D	FD	09/03/2019	Ground Water	255.42	265.42

N = Normal Sample
FD = Field Duplicate

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received September 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-302M2	MW-302M2_F19	194.35	204.43	08/29/2019	SW6850	Perchlorate	0.040	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-348M2	MW-348M2_F19	206.54	216.54	08/29/2019	SW6850	Perchlorate	0.18	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-331M2	MW-331M2_F19	195.27	205.27	08/29/2019	SW6850	Perchlorate	0.22		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-331M1	MW-331M1_F19	235.41	245.41	08/29/2019	SW6850	Perchlorate	0.071	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-589M2	MW-589M2_F19	211	221	08/28/2019	SW6850	Perchlorate	5.7		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-589M2	MW-589M2_F19D	211	221	08/28/2019	SW6850	Perchlorate	5.8		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-589M1	MW-589M1_F19	240	250	08/28/2019	SW6850	Perchlorate	0.13	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-327M2	MW-327M2_F19	265.01	275.01	08/28/2019	SW6850	Perchlorate	0.23		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-345M2	MW-345M2_F19	236.62	246.62	08/28/2019	SW6850	Perchlorate	0.042	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-612M2	MW-612M2_F19	267	277	08/27/2019	SW6850	Perchlorate	0.045	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-612M1	MW-612M1_F19	297	307	08/27/2019	SW6850	Perchlorate	0.042	J	ug/L	2.0		0.027	0.20
J2 Range Northern	J2EW3-MW1-B	J2EW3-MW1-B_F19	210.66	220.66	08/27/2019	SW6850	Perchlorate	0.069	J	ug/L	2.0		0.027	0.20
J2 Range Northern	J2EW3-MW1-C	J2EW3-MW1-C_F19	245.66	255.66	08/27/2019	SW6850	Perchlorate	3.2		ug/L	2.0	X	0.027	0.20
J1 Range Southern	MW-721M2	MW-721M2_R1	138.5	148.5	08/27/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.11	J	ug/L	0.60		0.036	0.20
J1 Range Southern	MW-720M2	MW-720M2_R1	126.2	136.2	08/26/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.5		ug/L	0.60	X	0.036	0.20
J1 Range Southern	MW-720M2	MW-720M2_R1	126.2	136.2	08/26/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.6		ug/L	400		0.025	0.20
J1 Range Southern	MW-722M1	MW-722M1_R1	114.2	124.2	08/26/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.72		ug/L	400		0.025	0.20
J1 Range Southern	MW-722M1	MW-722M1_R1	114.2	124.2	08/26/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.7		ug/L	0.60	X	0.036	0.20
J3 Range	MW-247M3	MW-247M3_F19	95	105	08/21/2019	SW6850	Perchlorate	0.063	J	ug/L	2.0		0.027	0.20
J3 Range	MW-247M2	MW-247M2_F19	125	135	08/21/2019	SW6850	Perchlorate	0.10	J	ug/L	2.0		0.027	0.20
J3 Range	MW-157M3	MW-157M3_F19	70	80	08/21/2019	SW6850	Perchlorate	0.076	J	ug/L	2.0		0.027	0.20
J3 Range	MW-157M2	MW-157M2_F19	110	120	08/21/2019	SW6850	Perchlorate	0.054	J	ug/L	2.0		0.027	0.20
J3 Range	MW-157M1	MW-157M1_F19	154	164	08/21/2019	SW6850	Perchlorate	0.21		ug/L	2.0		0.027	0.20
J3 Range	MW-250M3	MW-250M3_F19	95	105	08/20/2019	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.027	0.20
J3 Range	MW-250M3	MW-250M3_F19	95	105	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.19	J	ug/L	400		0.025	0.20
J3 Range	MW-250M3	MW-250M3_F19	95	105	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.49		ug/L	0.60		0.036	0.20
J3 Range	MW-250M3	MW-250M3_F19D	95	105	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.19	J	ug/L	400		0.025	0.20
J3 Range	MW-250M3	MW-250M3_F19D	95	105	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.50		ug/L	0.60		0.036	0.20
J3 Range	MW-250M2	MW-250M2_F19	145	155	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.15	J	ug/L	0.60		0.036	0.20
J3 Range	MW-250M2	MW-250M2_F19	145	155	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.83		ug/L	400		0.025	0.20
J3 Range	MW-250M2	MW-250M2_F19	145	155	08/20/2019	SW6850	Perchlorate	1.9		ug/L	2.0		0.027	0.20
J3 Range	MW-250M2	MW-250M2_F19D	145	155	08/20/2019	SW6850	Perchlorate	1.9		ug/L	2.0		0.027	0.20
J3 Range	MW-250M1	MW-250M1_F19	185	195	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.053	J	ug/L	400		0.025	0.20
J3 Range	MW-250M1	MW-250M1_F19	185	195	08/20/2019	SW6850	Perchlorate	0.062	J	ug/L	2.0		0.027	0.20
J3 Range	J3EW0032	J3EW0032_F19	102	152	08/20/2019	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	J3EW0032	J3EW0032_F19	102	152	08/20/2019	SW6850	Perchlorate	0.52		ug/L	2.0		0.027	0.20
J3 Range	J3EW0032	J3EW0032_F19	102	152	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.52		ug/L	0.60		0.036	0.20
J3 Range	J3EW0032	J3EW0032_F19D	102	152	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.17	J	ug/L	400		0.025	0.20
J3 Range	J3EW0032	J3EW0032_F19D	102	152	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.60		ug/L	0.60		0.036	0.20
J3 Range	90EW0001	90EW0001_F19	83.1	143.83	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.067	J	ug/L	400		0.025	0.20
J3 Range	90EW0001	90EW0001_F19	83.1	143.83	08/20/2019	SW6850	Perchlorate	0.21		ug/L	2.0		0.027	0.20
J3 Range	J3EWIP2	J3EWIP2_F19	149.5	169.5	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.24		ug/L	400		0.025	0.20

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

MCL/HA= Either the MCL or Lowest Health Advisory Limit

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received September 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	J3EWIP2	J3EWIP2_F19	149.5	169.5	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.33		ug/L	0.60		0.036	0.20
J3 Range	J3EWIP2	J3EWIP2_F19	149.5	169.5	08/20/2019	SW6850	Perchlorate	1.9		ug/L	2.0		0.027	0.20
J3 Range	J3EWIP2	J3EWIP2_F19D	149.5	169.5	08/20/2019	SW6850	Perchlorate	1.9		ug/L	2.0		0.027	0.20
J3 Range	J3EWIP1	J3EWIP1_F19	153	193	08/20/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.11	J	ug/L	0.60		0.036	0.20
J3 Range	J3EWIP1	J3EWIP1_F19	153	193	08/20/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.11	J	ug/L	400		0.025	0.20
J3 Range	J3EWIP1	J3EWIP1_F19	153	193	08/20/2019	SW6850	Perchlorate	0.42		ug/L	2.0		0.027	0.20
J3 Range	MW-359M2	MW-359M2_F19	148.62	158.62	08/19/2019	SW6850	Perchlorate	0.082	J	ug/L	2.0		0.027	0.20
J3 Range	MW-198M4	MW-198M4_F19	70	75	08/19/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.53		ug/L	0.60		0.036	0.20
J3 Range	MW-198M4	MW-198M4_F19	70	75	08/19/2019	SW6850	Perchlorate	0.92		ug/L	2.0		0.027	0.20
J3 Range	MW-198M4	MW-198M4_F19	70	75	08/19/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.5		ug/L	400		0.025	0.20
J3 Range	MW-198M4	MW-198M4_F19D	70	75	08/19/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.60		ug/L	0.60		0.036	0.20
J3 Range	MW-198M4	MW-198M4_F19D	70	75	08/19/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.5		ug/L	400		0.025	0.20
J3 Range	MW-198M3	MW-198M3_F19	100	105	08/19/2019	SW6850	Perchlorate	1.0		ug/L	2.0		0.027	0.20
J3 Range	MW-198M3	MW-198M3_F19	100	105	08/19/2019	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-198M2	MW-198M2_F19	120	125	08/19/2019	SW6850	Perchlorate	0.33		ug/L	2.0		0.027	0.20
J3 Range	MW-155M1	MW-155M1_F19	124	134	08/15/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.045	J	ug/L	0.60		0.036	0.20
J3 Range	MW-155M1	MW-155M1_F19	124	134	08/15/2019	SW6850	Perchlorate	0.15	J	ug/L	2.0		0.027	0.20
J3 Range	MW-142M2	MW-142M2_F19	140	150	08/15/2019	SW6850	Perchlorate	0.11	J	ug/L	2.0		0.027	0.20
J3 Range	MW-227M3	MW-227M3_F19	65	75	08/15/2019	SW6850	Perchlorate	0.069	J	ug/L	2.0		0.027	0.20
J3 Range	MW-227M2	MW-227M2_F19	110	120	08/15/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.046	J	ug/L	0.60		0.036	0.20
J3 Range	MW-227M2	MW-227M2_F19	110	120	08/15/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.9		ug/L	400		0.025	0.20
J3 Range	MW-227M2	MW-227M2_F19	110	120	08/15/2019	SW6850	Perchlorate	2.4		ug/L	2.0	X	0.027	0.20
J3 Range	MW-227M2	MW-227M2_F19D	110	120	08/15/2019	SW6850	Perchlorate	2.4		ug/L	2.0	X	0.027	0.20
J3 Range	MW-197M3	MW-197M3_F19	60.2	65.2	08/14/2019	SW6850	Perchlorate	0.10	J	ug/L	2.0		0.027	0.20
J3 Range	MW-197M3	MW-197M3_F19	60.2	65.2	08/14/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.12	J	ug/L	7.3		0.015	0.20
J3 Range	MW-197M3	MW-197M3_F19	60.2	65.2	08/14/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.42		ug/L	400		0.025	0.20
J3 Range	MW-197M3	MW-197M3_F19D	60.2	65.2	08/14/2019	SW8330	4-Amino-2,6-dinitrotoluene	0.12	J	ug/L	7.3		0.015	0.20
J3 Range	MW-197M3	MW-197M3_F19D	60.2	65.2	08/14/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.42		ug/L	400		0.025	0.20
J3 Range	MW-197M2	MW-197M2_F19	80.2	85.2	08/14/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.16	J	ug/L	0.60		0.036	0.20
J3 Range	MW-197M2	MW-197M2_F19	80.2	85.2	08/14/2019	SW6850	Perchlorate	0.19	J	ug/L	2.0		0.027	0.20
J3 Range	MW-197M2	MW-197M2_F19	80.2	85.2	08/14/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.47		ug/L	400		0.025	0.20
J3 Range	MW-653M2	MW-653M2_F19	59.3	69.3	08/14/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.12	J	ug/L	0.60		0.036	0.20
J3 Range	MW-653M1	MW-653M1_F19	147.5	157.5	08/14/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.057	J	ug/L	0.60		0.036	0.20
J3 Range	MW-653M1	MW-653M1_F19	147.5	157.5	08/14/2019	SW6850	Perchlorate	0.18	J	ug/L	2.0		0.027	0.20
J3 Range	MW-653M1	MW-653M1_F19	147.5	157.5	08/14/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.49		ug/L	400		0.025	0.20
J3 Range	MW-576M3	MW-576M3_F19	98.9	108.9	08/13/2019	SW6850	Perchlorate	0.070	J	ug/L	2.0		0.027	0.20
J3 Range	MW-576M2	MW-576M2_F19	133.9	143.9	08/13/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.032	J	ug/L	400		0.025	0.20
J3 Range	MW-576M2	MW-576M2_F19	133.9	143.9	08/13/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.072	J	ug/L	0.60		0.036	0.20
J3 Range	MW-576M2	MW-576M2_F19	133.9	143.9	08/13/2019	SW6850	Perchlorate	0.21		ug/L	2.0		0.027	0.20
J3 Range	MW-576M2	MW-576M2_F19D	133.9	143.9	08/13/2019	SW6850	Perchlorate	0.21		ug/L	2.0		0.027	0.20
J3 Range	MW-576M1	MW-576M1_F19	173.9	183.9	08/13/2019	SW6850	Perchlorate	0.85		ug/L	2.0		0.027	0.20
J3 Range	MW-636M2	MW-636M2_F19	110.5	120.5	08/13/2019	SW6850	Perchlorate	0.084	J	ug/L	2.0		0.027	0.20

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

MCL/HA= Either the MCL or Lowest Health Advisory Limit

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received September 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-143M3	MW-143M3_F19	107	112	08/12/2019	SW6850	Perchlorate	0.064	J	ug/L	2.0		0.027	0.20
J3 Range	MW-143M2	MW-143M2_F19	117	122	08/12/2019	SW6850	Perchlorate	0.068	J	ug/L	2.0		0.027	0.20
J3 Range	MW-143M1	MW-143M1_F19	144	154	08/12/2019	SW6850	Perchlorate	0.22		ug/L	2.0		0.027	0.20
J3 Range	MW-243M2	MW-243M2_F19	84.5	94.5	08/08/2019	SW6850	Perchlorate	0.073	J	ug/L	2.0		0.027	0.20
J3 Range	MW-243M1	MW-243M1_F19	114.5	124.5	08/08/2019	SW6850	Perchlorate	0.16	J	ug/L	2.0		0.027	0.20
J3 Range	MW-637M3	MW-637M3_F19	174.1	184.1	08/07/2019	SW6850	Perchlorate	0.038	J	ug/L	2.0		0.027	0.20
J3 Range	MW-637M2	MW-637M2_F19	214.1	224.1	08/07/2019	SW6850	Perchlorate	3.3		ug/L	2.0	X	0.027	0.20
J3 Range	MW-637M2	MW-637M2_F19D	214.1	224.1	08/07/2019	SW6850	Perchlorate	3.3		ug/L	2.0	X	0.027	0.20
J3 Range	MW-343M1	MW-343M1_F19	214.83	224.83	08/07/2019	SW6850	Perchlorate	0.28		ug/L	2.0		0.027	0.20
J3 Range	J3-MW-1-B	J3-MW-1-B_F19	175.61	185.61	08/06/2019	SW6850	Perchlorate	1.5		ug/L	2.0		0.027	0.20
J3 Range	J3-MW-1-C	J3-MW-1-C_F19	203.61	213.61	08/06/2019	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.027	0.20
J3 Range	90MP0059B	90MP0059B_F19	116.39	118.89	08/06/2019	SW6850	Perchlorate	0.29		ug/L	2.0		0.027	0.20
J3 Range	90MW0054	90MW0054_F19	107	112	08/06/2019	SW6850	Perchlorate	0.56		ug/L	2.0		0.027	0.20
J3 Range	90MW0054	90MW0054_F19	107	112	08/06/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2.5	J	ug/L	400		0.025	0.20
J2 Range Northern	MW-630M1	MW-630M1_F19	217	227	08/01/2019	SW6850	Perchlorate	0.055	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-632M1	MW-632M1_F19	254.5	264.5	08/01/2019	SW6850	Perchlorate	0.094	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-619M2	MW-619M2_F19	234.1	244.1	08/01/2019	SW6850	Perchlorate	0.089	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-619M1	MW-619M1_F19	255.1	265.1	08/01/2019	SW6850	Perchlorate	0.10	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-620M1	MW-620M1_F19	268.6	278.6	08/01/2019	SW6850	Perchlorate	0.089	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-613M1	MW-613M1_F19	267.1	277.1	07/31/2019	SW6850	Perchlorate	0.047	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-318M1	MW-318M1_F19	305.8	315.8	07/31/2019	SW6850	Perchlorate	0.078	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-635M1	MW-635M1_F19	265.4	275.4	07/31/2019	SW6850	Perchlorate	0.076	J	ug/L	2.0		0.027	0.20
J2 Range Northern	J2EW2-MW3-B	J2EW2-MW3-B_F19	212.7	222.7	07/30/2019	SW6850	Perchlorate	1.1		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-585M3	MW-585M3_F19	198.5	208.5	07/23/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.54	J	ug/L	0.60		0.036	0.20
J2 Range Northern	MW-585M3	MW-585M3_F19	198.5	208.5	07/23/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.1	J	ug/L	400		0.025	0.20
J2 Range Northern	MW-585M3	MW-585M3_F19	198.5	208.5	07/23/2019	SW6850	Perchlorate	1.4		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-585M3	MW-585M3_F19D	198.5	208.5	07/23/2019	SW8330	2,4,6-Trinitrotoluene	0.18	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-585M3	MW-585M3_F19D	198.5	208.5	07/23/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.57	J	ug/L	0.60		0.036	0.20
J2 Range Northern	MW-585M3	MW-585M3_F19D	198.5	208.5	07/23/2019	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	1.1	J	ug/L	400		0.025	0.20
J2 Range Northern	MW-585M2	MW-585M2_F19	218.5	228.5	07/23/2019	SW6850	Perchlorate	1.5		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-585M1	MW-585M1_F19	240	250	07/23/2019	SW6850	Perchlorate	0.037	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-585M1	MW-585M1_F19	240	250	07/23/2019	SW8330	2,4,6-Trinitrotoluene	0.081	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-634M3	MW-634M3_F19	170.6	180.6	07/23/2019	SW8330	2,4,6-Trinitrotoluene	0.089	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-634M3	MW-634M3_F19	170.6	180.6	07/23/2019	SW6850	Perchlorate	0.35		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-634M2	MW-634M2_F19	200.6	210.6	07/23/2019	SW8330	2,4,6-Trinitrotoluene	0.11	J	ug/L	2.0		0.027	0.20
J2 Range Northern	MW-634M2	MW-634M2_F19	200.6	210.6	07/23/2019	SW6850	Perchlorate	1.4		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-634M1	MW-634M1_F19	305.6	315.6	07/23/2019	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.077	J	ug/L	0.60		0.036	0.20
J2 Range Northern	MW-634M1	MW-634M1_F19	305.6	315.6	07/23/2019	SW6850	Perchlorate	0.31		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-640M2	MW-640M2_F19	216	226	07/22/2019	SW6850	Perchlorate	1.6		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-640M1	MW-640M1_F19	246	256	07/22/2019	SW6850	Perchlorate	5.1		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-640M1	MW-640M1_F19D	246	256	07/22/2019	SW6850	Perchlorate	4.9		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-622M2	MW-622M2_F19	220.4	230.4	07/22/2019	SW6850	Perchlorate	2.4		ug/L	2.0	X	0.027	0.20

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TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received September 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-622M1	MW-622M1_F19	245.4	255.4	07/22/2019	SW6850	Perchlorate	0.68		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-704M2	MW-704M2_F19	217.8	227.8	07/22/2019	SW6850	Perchlorate	1.2		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-704M1	MW-704M1_F19	244	254	07/22/2019	SW6850	Perchlorate	0.19	J	ug/L	2.0		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_PFAS19	FPR-2-INF_PFAS19	MW-258M1_PFAS19	MW-663D_PFAS19	PR-INF_PFAS19
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 (PFTrDA)	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_PFAS19	FPR-2-INF_PFAS19	MW-258M1_PFAS19	MW-663D_PFAS19	PR-INF_PFAS19
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 (PFTrDA)	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_PFAS19	J1N-INF2_PFAS19R	MW-136S_PFAS19	MW-564M1_PFAS19	MW-590M2_PFAS19
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 (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

Location	J1N-INF2	J1N-INF2	MW-136S	MW-564M1	MW-590M2
Field Sample ID	J1N-INF2_PFAS19	J1N-INF2_PFAS19R	MW-136S_PFAS19	MW-564M1_PFAS19	MW-590M2_PFAS19
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_PFAS19**	**J2E-INF-J_PFAS19**	**J2E-INF-K_PFAS19**	**MW-307M3_PFAS19**	**MW-307M3_PFAS19D**	**MW-368M1_PFAS19**
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 (PFTrDA)	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_PFAS19	J2E-INF-J_PFAS19	J2E-INF-K_PFAS19	MW-307M3_PFAS19	MW-307M3_PFAS19D	MW-368M1_PFAS19
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 (PFTrDA)	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 (PFTrDA)	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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Joint Base Cape Cod, IAGWSP

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 (PFTrDA)	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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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_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	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 (PFTrDA)	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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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 (PFTrDA)	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**

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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 (PFTrDA)	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 (PFTrDA)	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.50 U
†PFOS + PFOA (EPA)	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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_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	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**

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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**

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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 (PFTrDA)	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U
†PFOS + PFOA (EPA)	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**

PFAS Summary Report – Groundwater

Joint Base Cape Cod, IAGWSP

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 (PFTrDA)	2.90 U
Perfluoroundecanoic acid (PFUnA)	1.40 U
†PFOS + PFOA (EPA)	**0.00**
‡PFOS + PFOA + PFDA + PFHpA + PFHxS + PFNA (MassDEP)	**0.00**

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