MONTHLY PROGRESS REPORT #262
FOR JANUARY 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 to 31 January 2019.

1. SUMMARY OF REMEDIATION ACTIONS

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of January 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 2.616 billion gallons of water treated and re-injected as of 31 January 2019. No Frank Perkins Road Treatment Facility shut downs occurred in the January reporting period.

The Pew Road Mobile Treatment Unit (MTU) is operating at a flow rate of 100 gpm (increased from 65 gpm on 18 June 2019), with over 604.6 million gallons of water treated and re-injected as of 31 January 2019. No Pew Road MTU shut downs occurred in the January reporting period.

The Base Boundary MTU is operating at a flow rate of 65 gpm with over 220.9 million gallons of water treated and re-injected as of 31 January 2019. The following Base Boundary MTU shut down occurred in the January reporting period:

- The Base Boundary MTU was turned off to replace a leaking IX vessel effluent hose. The MTU was turned off at 0825 on 31 January 2019 and was restarted at 0914 on 31 January 2019, resulting in 0.82 hours of downtime.

The Leading Edge system continues to operate at a flow rate of 100 gpm. As of 31 January 2019, over 131.1 million gallons of water treated and re-injected. The following Leading Edge system shut down occurred in the January reporting period:

- The Leading Edge MTU shut down due to a “Phase/Voltage Fault” alarm caused by a power supply interruption. The MTU shut down at 0702 on 25 January 2019 and was restarted at 0751 on 25 January 2019, resulting in 0.82 hours of downtime.

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 31 January 2019, over 1.088 billion gallons of water have been treated and re-injected. No Northern Treatment Building shutdowns occurred in the January reporting period.

The Northern MTUs E and F continue to operate at a flow rate of 250 gpm. As of 31 January 2019, over 1.543 billion gallons of water have been treated and re-injected. The following J-2 Range Northern system shut downs occurred in the January reporting period:

- MTU E shut down due to a power supply interruption. The MTU shut down at 2027 on 21 January 2019 and was restarted at 0850 on 22 January 2019, resulting in 12.38 hours of downtime.
- MTU F shut down due to a power supply interruption. The MTU shut down at 0418 on 22 January 2019 and was restarted at 0818 on 22 January 2019, resulting in 4.00 hours of downtime.
- MTUs E and F shut down due to a “Bag filter inlet high pressure” alarm due to a communication error from the extraction well PLC to the MTU caused by the extremely cold temperatures. The MTUs shut down at 0918 on 22 January 2019 and were restarted in hand control at 1020 on 22 January 2019, resulting in 1.03 hours of downtime. The MTUs were returned to automatic control at 0800 on 23 January 2019, after the cold front had passed.
- MTU E shut down due to a power supply interruption. The MTU shut down at 0548 on 01 February 2019 and was restarted at 0800 on 01 February 2019, resulting in 2.2 hours of downtime.

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 31 January 2019, over 1.192 billion gallons of water have been treated and re-injected. No MTU H and I shutdowns occurred in the January reporting period.

MTU J continues to operate at a flow rate of 120 gpm. As of 31 January 2019, over 542.5 million gallons of water have been treated and re-injected. No MTU J shutdowns occurred in the January reporting period.

MTU K continues to operate at a flow rate of 125 gpm. As of 31 January 2019, over 657.3 million gallons of water have been treated and re-injected. No MTU K shutdowns occurred in the January reporting period.

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 a flow rate of 255 gpm (while J3EW0032 is running at 45 gpm instead of 65 gpm). As of 31 January 2019, over 1.203 billion gallons of water have been treated and re-injected. The following J-3 Range system shut downs occurred in the January reporting period:

- The system shut down due to a power supply interruption. The system shut down at 1345 on 20 January 2019 and was restarted at 0754 on 22 January 2019, resulting in 42.15 hours of downtime.
- The system shut down due to a "Treatment facility storage tank high level" alarm caused by an FS-12 shut down. The system shut down at 1648 on 24 January 2019 and was restarted at 1109 on 25 January 2019, resulting in 18.35 hours of downtime.
- The system shut down due to a "Treatment facility storage tank high level" alarm caused by an FS-12 shut down. The system shut down at 1055 on 29 January 2019 and was restarted at 1249 on 29 January 2019, resulting in 1.9 hours of downtime.

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 31 January 2019, over 519.9 million gallons of water have been treated and re-injected. No J-1 Range Southern system shut downs occurred in the January reporting period.

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 31 January 2019, over 666.1 million gallons of water have been treated and re-injected. No J-1 Range Northern MTU shut downs occurred in the January reporting period.

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 31 January 2019, over 1.584 billion gallons of water have been treated and re-injected. No CIA treatment facility shut downs occurred in the January reporting period.

SUMMARY OF ACTIONS TAKEN

CIA

- Performed routine inspections of BEM cover at the Central Impact Area to ensure cover is secure and intact.
- Conducted investigation of missed QC seeds.
- Groundwater sampling within the Central Impact Area SPM program.

Demolition Area 1

- Groundwater sampling within the Demo 1 GW program.
- Exchanged bag filters at the Pew Road MTU.
- Exchanged bag filters at the Leading Edge MTU.
- Replaced the backwash pump bypass/run contactor at the Frank Perkins Treatment Facility.

Small Arms Ranges

- Groundwater sampling within the Small Arms Ranges LTM program.

J2 Range

- Groundwater sampling within the J2 East SPM program.
- Groundwater sampling within the J2 North SPM program.
- Hydraulic monitoring within the J2 East SPM program.

J3 Range

- Groundwater sampling within the J3 Range SPM program.

L Range

- Groundwater sampling within the L Range LTM program.

Training Areas

- Groundwater sampling within the Training Areas LTM program.

Other

- Process water samples were collected from the 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 B Range, C Range, the Central Impact Area, CS-10 (ARNG), Demolition Area 1, G Range, GA Range, GB Range, J2 Range Eastern, J2 Range Northern, J3 Range, and L Range.

JBCC IAGWSP Tech Update Meeting Minutes 24 January 2019

Project and Fieldwork Update

Currently there is no drilling. Long term monitoring sampling is underway in the Small Arms Ranges and will be moving to the Central Impact Area next. All treatment systems are up and running. There are

potential monitoring well locations for J-1 south awaiting project note approval. There is also a project note for additional shallow monitoring wells in the CIA.

Since the last tech update, soil removal at D Range, C Range, and Former B Range has been conducted. Based on the post-excavation soil sampling results, additional lifts are required at D Range (Eastern portion of grid under former stockpile) and Former B Range (base of hill). In the Small Arms Range, KGS will be mobilizing back out in the spring to do the additional lifts. All stockpiled soil has been moved off-site.

Central Impact Area 100% Verification Grid Presentation

A presentation was provided on the results of the CIA Phase 3 Area 1 100% dig validation. A figure showing the current grid (48_57) as well as the first grid selected for validation (39_35) 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 48_57. There were 564 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 248 met the dig criteria resulting in a recommended dig rate of 44%. The remaining 316 anomalies were dug for QA. Thirty-two TOI (UXO or UXO-like items) were recovered. For the classification results, 310 clutter items were correctly classified, and 41.8% of the clutter was incorrectly classified as “likely-TOI” therefore not meeting the goal of reduction of clutter digs by 70%.

This was caused by the nature of the clutter: large amounts of metal debris throughout the grid overwhelmed the model and the higher than anticipated clutter dig rate was unavoidable due to the conditions of this particular grid. This was consistent with the results seen over the last several years. It was noted that a total of nine UXO items, 16 UXO-like items and one seed items were correctly classified.

A photo of the incorrectly classified TOI was displayed and discussed. There were six UXO items, all 81mm mortars. They were all deeper than the consistent detection depth. In addition, the large distances between the EM61 targets, modeled MetalMapper source locations, and recovered MEC items indicate that other metal was actually what was detected and modeled and these UXO were recovered incidentally when clearing the 1m radius holes. In addition to the incorrectly classified TOI, there was an intrusive failure. Two UXO recovered from EM61 digs within the 1m dig radius of a MetalMapper classified dig (holes were not cleared). USACE instructed Parsons to perform a root cause analysis. The analysis determined that there was incomplete hole clearance and a misinterpretation of stop-dig rules in areas saturated with small buried metal (not sanitizing the ground of all pieces of metal, but must remove detectable TOI). The area was in a relatively higher metal density grid (next to Tank Alley) and the UXO was deeper than the consistent detection depth for 81mm mortars. Additionally, there was inadequate documentation of dig results & inadequate review for anomaly resolution. Because of this, Parsons performed an initial corrective action consisting of a re-dig of the adjacent grids (47_57 and 49_57), which exhibit similar levels of saturation, with increased diligence in chasing smaller ring-offs and better documentation. If UXO is found, the team will evaluate the need for additional rework.

The results of the initial corrective action were that three additional UXO items were recovered from previously dug holes (81mm at 18cm, 81mm at 61cm, 60mm at 95cm; Dec 14 & 18). Additionally, USACE and Parsons determined that numerous seed items were not recovered during 1 meter clearance of their seeded locations. USACE issued a “Form 6048” to Parsons to document these critical deficiencies (Dec 19) which required an official response by Jan 3. Twenty-two (of 175) were not recovered (dig dates ranging from 8/20-11/21) and the failure to recover seeds was not noticed until end of season (Dec).

During the 100% dig and corrective action, UXO was recovered from holes previously declared ‘clear’ and therefore the initial intrusive results cannot be trusted as complete. USACE Contracting Officer issued Letter of Concern to Parsons.

It was determined that the causes of the failure were due to several factors. First, inadequate hole clearance. In an attempt to balance the need for increased dig production and clearing 1m digs, too much metal was left in the ground. USACE advised Parsons in July that grids need not be ‘sanitized’ of all tiny frag/rust flakes, as long as the TOI was recovered. There were subjective decisions made by UXO Techs that analog responses were due to sources too small to be UXO. This decision making was not well defined nor documented, and not what was expected by USACE. Secondly, there was inadequate geophysicist review of dig results. The dig results were accepted by Parsons geophysicists even though the documented results in many cases do not adequately explain the expected source. There was reliance on expectations (‘we know lots of metal at every hole’) versus what was actually documented and complacency given the significant amount of non-TOI metal. Finally, there was a failure to recognize problems until the end of season because no one was tracking seed item recovery as the digging progressed.

The recommended corrective action going forward is to re-dig all Phase 3 Area 1 MetalMapper classified dig locations and polygons, with the exception of the first 100% grid and the two that were already re-dug. Additional seeds will be placed at some re-dig locations. The QAPP/SOPs will be updated with additional details for dig procedures and required documentation and responsibilities for checking seeds. The USACE QASP will be updated with defined tasks and a schedule for review.

The current status and path forward was reviewed. In Phase III Area 1, EM61 and MetalMapper 2X2 data collection and analysis are complete. The team is working on revisions to the QAPP/SOPs/dig procedures. The Draft 2018 Annual Report will be submitted on time and will note remaining work required for resolution. The re-dig will occur in the spring as the next 15 acres begin. A status map showing work conducted as of January 2019 was displayed.

Action Items

The action items were discussed and updated.

J-2 Range Eastern Annual Environmental Monitoring Report Presentation

A presentation was provided on the J-2 Range Eastern Annual Environmental Monitoring Report. It was noted that during the reporting period (November 2017 to October 2018), new work included one new profile at J2EW0004 stagnation zone (BH-705) to further define the magnitude and extent of perchlorate and explosives. Monitoring wells (MW-705M1/M2) were constructed at various depths based on profile concentrations of perchlorate and RDX but well data for MW-705M1/M2 was not available at the time of report preparation. The J-2 Range Eastern groundwater treatment system performance statistics were reviewed and discussed. During the reporting period, at MTU J, 60.4 million gallons of groundwater were treated, 0.26 pounds of perchlorate and 0.06 pounds of RDX were removed. At MTUs H and I, 116.8 million gallons of water were treated, 1.40 pounds of perchlorate and 0.31 pounds of RDX were removed. At MTU K, 63.5 million gallons of water were treated, 0.57 pounds of perchlorate and 0.23 pounds of RDX were removed.

Sampling locations, groundwater monitoring results, and trends were reviewed and discussed. Perchlorate concentrations ranged from non-detect to 31.9 µg/L (MW-368M1), and there were 10 wells with concentrations above 2 µg/L and 1 well with concentrations above 15 µg/L. RDX concentrations ranged from non-detect to 9.4 µg/L (MW-368M2), and there were 5 wells with concentrations above 0.6

µg/L, 5 wells with concentrations above 2 µg/L, and no wells greater than 20 µg/L. Trend plots and cross-sections were reviewed. An overview of the hydraulic analyses completed in February and September 2018 was presented. It was noted that the numerical model indicates that the perchlorate and RDX plumes are being captured and that stagnation points downgradient of each extraction well are creating a disjointed plume.

Decision Document cleanup timelines were discussed. Perchlorate and RDX measurements indicate that the plumes are reasonably well predicted, but the expected overall cleanup time is 15 years longer than the Decision Document timeline, likely the result of the statistical mapping of contamination to lower K units that may not be realistic.

IAGWSP recommends making no modifications to plant operations, sampling, or extraction rates. IAGWSP recommends adding well screens MW-705M1/M2 to the chemical and hydraulic monitoring programs.

J-2 Range Northern Annual Environmental Monitoring Report Presentation

A presentation was provided on the J-2 Range Northern Annual Environmental Monitoring Report. It was noted that during the reporting period (November 2017 to October 2018), new work included three new profiles (BH-702/BH-703/BH-704), which were completed to further define the magnitude and extent of perchlorate and explosives. Monitoring wells (MW-702M1/M2, MW-703M1/M2 and MW-704M1/M2) were constructed at various depths based on profile concentrations of perchlorate and RDX, but well data was not available at the time of report preparation. Northern groundwater treatment system performance statistics were reviewed and discussed. During the reporting period at MTUs E and F (Wood Road), 123.6 million gallons of groundwater were treated, and 2.94 pounds of perchlorate and 0.49 pounds of RDX were removed. At MTU G (Jefferson Road), 117.3 million gallons of water were treated, and 0.49 pounds of perchlorate and zero pounds of RDX were removed.

Sampling locations, groundwater monitoring results, and trends were reviewed and discussed. Perchlorate concentrations ranged from non-detect to 68.6 µg/L (MW-587M2); there were 13 wells with concentrations above 2 µg/L and 1 well with concentrations above 15 µg/L. RDX concentrations ranged from non-detect to 4.2 µg/L (MW-289M2); there were 3 wells with concentrations above 0.6 µg/L, one well with concentrations above 2 µg/L, and no wells with concentrations above 20 µg/L. An overview of the hydraulic analysis completed in August 2018 was presented. It was noted that the numerical model indicates that the perchlorate plume is being captured and that the smaller plumelets are expected to diminish based on long-term modeling. Also, stagnation points downgradient of each extraction well are creating a disjointed plume.

Decision Document cleanup timelines were discussed. Perchlorate measurements indicate that the plume is reasonably well predicted, but expected overall cleanup time is 18 years longer than the Decision Document timeline, likely the result of the statistical mapping of contamination to lower K units that may not be realistic. IAGWSP recommends making no modifications to plant operations, sampling or extraction rates. IAGWSP recommends adding six well screens (MW-702M1/M2, MW-703M1/M2 and MW-704M1/M2) to the hydraulic and chemical monitoring program.

J-3 Range Annual Environmental Monitoring Report Presentation

A presentation was provided on the J-3 Range Annual Environmental Monitoring Report. It was noted that during the reporting period (August 2017 to August 2018), a profile boring, BH-701, was advanced adjacent to the MW-227 well cluster. Groundwater profile samples were collected at 10-foot intervals,

beginning just below the bottom of MW-227M1 (-21 ft MSL), to the bedrock surface (-103 ft MSL). All samples were non-detect for both perchlorate and explosives. Two monitoring well screens were constructed: MW-701M1 (screened -60 to -70 ft MSL) and MW-701M2 (screened -30 to -40 ft MSL). In addition, updated plumes for both perchlorate and RDX were developed in March 2018 and were utilized for the fate and transport modeling associated with this annual report. The J-3 Range treatment system performance statistics were reviewed and discussed. During the reporting period, 116.8 million gallons of groundwater were treated, and 1.42 pounds of perchlorate and 0.40 pounds of RDX were removed.

Sampling locations, groundwater monitoring results, and trends were reviewed and discussed. The maximum perchlorate concentration in Zone 1 (Source Area to Base Boundary) was 3.4 µg/L (MW-136S), and the maximum RDX concentration was 5.5µg/L (MW-576M2). In Zone 2 (Downgradient of Base Boundary), the maximum perchlorate concentration was 7.7 µg/L (MW-227M2), and the maximum RDX concentration was 1.2 µg/L (MW-250M3). An overview of the hydraulic analysis completed in July 2018 was presented. It was noted that the hydraulic data/hydraulic gradients were consistent with past reporting periods and that the flow direction is generally north to south with convergent flow near the extraction wells.

The modeled vs. observed plume comparison was discussed. The groundwater flow model plume shell was updated in March of 2018, and the simulated migration incorporated 2018 data. Notable observations were that in the downgradient area, the measured plumes were consistent with the model predicted plumes. In the source area, the observed plumes depict the source area contamination where the model predicted plume forward migrates it. The capture zone analysis was developed using reverse particle tracking and shows that the existing system appears to be adequately capturing the plumes.

Surface water monitoring of Snake Pond and the J-3 Wetland were discussed. For Snake Pond, there were two sampling events (May and June 2018); explosives were all non-detect, and perchlorate samples were below the reporting limit. The results were consistent with past reporting periods. The J-3 wetland data was also consistent with previous monitoring; it indicated a poor hydraulic connection between the aquifer and wetland and no evidence of impact from the operation of the J-3 system on wetland water levels.

IAGWSP recommends that the two newly constructed well screens, MW-701M1/M2, be added to the chemical monitoring network and sampled for both perchlorate and explosives on an annual basis. A proposal remains to discontinue Snake Pond surface water sampling pending a Sandwich Board of Health review. Surface water sampling will continue according to the currently approved schedule pending a final decision. There are no recommendations for the fate and transport modeling, as a plume shell update completed in March 2018.

JBCC Cleanup Team Meeting

The next JBCC Cleanup Team (JBCCCT) meeting has yet to be scheduled (previous meeting was 29 August 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 January to 31 January 2019. Validated detections of explosives compounds and perchlorate for all groundwater results received from 1 January to 31 January 2019. The January treatment system influent summary is not included due to no validated perchlorate or explosives results available at report submittal time. 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.

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 Areas, 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. 261 for December 2018 — 10 Jan 2019
- 2018 JBCC CIA Annual Report_Draft_Rev0 — 17 Jan 2019
- Demolition Area 1 Pew Road Optimization Project Note — 29 Jan 2019
- Final Demolition Area 1 2018 Annual Environmental Monitoring Report, dated January 2018 — 31 Jan 2019

3. SCHEDULED ACTIONS

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

<u>Training Areas</u>

- Final Training Areas Decision Document

<u>Annual Reports/ Environmental Monitoring Reports/Work Plans</u>

- Final Demolition Area 1 Annual Monitoring Report
- Final Northwest Corner Annual Monitoring Report
- Draft CIA Annual Monitoring Report response to comments (RTCs)
- Draft J-2 Range Northern and J-2 Range Eastern Annual Monitoring Report RTCs
- Draft J-3 Range Annual Monitoring Report RTCs

<u>Central Impact Area</u>

- 2018 CIA Source Removal Annual Report
- 2019 Work Plan

<u>Miscellaneous</u>

- Draft Five Year Review Report
- J-2 Range Geophysical Completion of Work Report and additional well locations
- Certificates of Compliance
- PFAS sampling project note RTCs and revised Work Plan
- CIA and J-2 Range rocket disposal recommendations
- J-1 South project note for additional well locations

TABLE 1
Sampling Progress: 1 January to 31 January 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
B Range	MW-455S	MW-455S_S19	N	01/22/2019	Ground Water	117.57	127.57
B Range	MW-490S	MW-490S_S19	N	01/17/2019	Ground Water	108.08	118.08
B Range	MW-539M1	MW-539M1_S19	N	01/16/2019	Ground Water	113.00	123.00
B Range	MW-537M1	MW-537M1_S19	N	01/16/2019	Ground Water	106.00	116.00
B Range	MW-72S	MW-72S_S19	N	01/16/2019	Ground Water	106.00	116.00
B Range	MW-72S	MW-72S_S19D	FD	01/16/2019	Ground Water	106.00	116.00
C Range	MW-491S	MW-491S_S19	N	01/17/2019	Ground Water	146.93	156.93
C Range	MW-456S	MW-456S_S19	N	01/17/2019	Ground Water	150.34	160.34
Central Impact Area	MW-442M2	MW-442M2_S19	N	01/30/2019	Ground Water	215.30	225.30
Central Impact Area	MW-442M1	MW-442M1_S19	N	01/30/2019	Ground Water	247.60	257.60
Central Impact Area	MW-03M2	MW-03M2_S19	N	01/30/2019	Ground Water	180.00	185.00
Central Impact Area	MW-204M2	MW-204M2_S19	N	01/30/2019	Ground Water	76.00	86.00
Central Impact Area	MW-204M1	MW-204M1_S19	N	01/30/2019	Ground Water	141.00	151.00
Central Impact Area	MW-123S	MW-123S_S19	N	01/22/2019	Ground Water	139.00	149.00
Central Impact Area	MW-455S	MW-455S_S19	N	01/22/2019	Ground Water	117.57	127.57
Central Impact Area	MW-72S	MW-72S_S19	N	01/16/2019	Ground Water	106.00	116.00
Central Impact Area	MW-72S	MW-72S_S19D	FD	01/16/2019	Ground Water	106.00	116.00
Central Impact Area	CIA1-EFF	CIA1-EFF-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA1-MID2	CIA1-MID2-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA1-MID1	CIA1-MID1-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA1-INF	CIA1-INF-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA2-EFF	CIA2-EFF-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA2-MID2	CIA2-MID2-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA2-MID1	CIA2-MID1-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA2-INF	CIA2-INF-60A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA3-EFF	CIA3-EFF-31A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA3-MID2	CIA3-MID2-31A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA3-MID1	CIA3-MID1-31A	N	01/03/2019	Process Water	0.00	0.00
Central Impact Area	CIA3-INF	CIA3-INF-31A	N	01/03/2019	Process Water	0.00	0.00
CS-10 (ARNG)	03MW0709	03MW0709_S19	N	01/23/2019	Ground Water	82.12	87.12
Demolition Area 1	MW-35S	MW-35S_S19	N	01/24/2019	Ground Water	84.00	94.00
Demolition Area 1	MW-36S	MW-36S_S19	N	01/24/2019	Ground Water	73.00	83.00
Demolition Area 1	PR-EFF	PR-EFF-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	PR-MID-2	PR-MID-2-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	PR-MID-1	PR-MID-1-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	PR-INF	PR-INF-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	FPR-2-INF	FPR-2-INF-154A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1LE-EFF	D1LE-EFF-30A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1LE-MID2	D1LE-MID2-30A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1LE-MID1	D1LE-MID1-30A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1LE-INF	D1LE-INF-30A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1-EFF	D1-EFF-102A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1-MID-2	D1-MID-2-102A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1-MID-1	D1-MID-1-102A	N	01/04/2019	Process Water	0.00	0.00
Demolition Area 1	D1-INF	D1-INF-102A	N	01/04/2019	Process Water	0.00	0.00
G Range	MW-470S	MW-470S_S19	N	01/22/2019	Ground Water	76.32	86.32
GA Range	03MW0710	03MW0710_S19	N	01/28/2019	Ground Water	73.60	83.30
GA Range	MW-690S	MW-690S_S19	N	01/23/2019	Ground Water	99.20	109.20
GB Range	03MW0122A	03MW0122A_S19	N	01/23/2019	Ground Water	83.44	93.44
J1 Range Northern	J1N-EFF	J1N-EFF-63A	N	01/02/2019	Process Water	0.00	0.00
J1 Range Northern	J1N-MID2	J1N-MID2-63A	N	01/02/2019	Process Water	0.00	0.00
J1 Range Northern	J1N-MID1	J1N-MID1-63A	N	01/02/2019	Process Water	0.00	0.00
J1 Range Northern	J1N-INF2	J1N-INF2-63A	N	01/02/2019	Process Water	0.00	0.00
J1 Range Southern	J1S-EFF	J1S-EFF-134A	N	01/04/2019	Process Water	0.00	0.00
J1 Range Southern	J1S-MID	J1S-MID-134A	N	01/04/2019	Process Water	0.00	0.00
J1 Range Southern	J1S-INF-2	J1S-INF-2-134A	N	01/04/2019	Process Water	0.00	0.00

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 January to 31 January 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-339M1	MW-339M1_S19	N	01/29/2019	Ground Water	233.00	243.00
J2 Range Eastern	MW-368M2	MW-368M2_S19	N	01/29/2019	Ground Water	202.73	212.73
J2 Range Eastern	MW-368M2	MW-368M2_S19D	FD	01/29/2019	Ground Water	202.73	212.73
J2 Range Eastern	MW-324M2	MW-324M2_S19	N	01/29/2019	Ground Water	203.74	214.74
J2 Range Eastern	MW-324M1	MW-324M1_S19	N	01/29/2019	Ground Water	234.85	244.85
J2 Range Eastern	MW-393D	MW-393D_S19	N	01/28/2019	Ground Water	313.56	323.56
J2 Range Eastern	J2MW-04M2	J2MW-04M2_S19	N	01/28/2019	Ground Water	210.00	220.00
J2 Range Eastern	J2MW-04M1	J2MW-04M1_S19	N	01/28/2019	Ground Water	257.00	267.00
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-INF-K	J2E-INF-K-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-INF-J	J2E-INF-J-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Eastern	J2E-INF-I	J2E-INF-I-124A	N	01/07/2019	Process Water	0.00	0.00
J2 Range Northern	MW-324M2	MW-324M2_S19	N	01/29/2019	Ground Water	203.74	214.74
J2 Range Northern	J2EW0001	J2EW0001_S19	N	01/14/2019	Ground Water	179.00	234.00
J2 Range Northern	J2EW0001	J2EW0001_S19D	FD	01/14/2019	Ground Water	179.00	234.00
J2 Range Northern	J2EW0002	J2EW0002_S19	N	01/14/2019	Ground Water	198.00	233.00
J2 Range Northern	J2EW0002	J2EW0002_S19D	FD	01/14/2019	Ground Water	198.00	233.00
J2 Range Northern	J2EW0003	J2EW0003_S19	N	01/14/2019	Ground Water	202.00	232.00
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-INF-G	J2N-INF-G-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-148A	N	01/02/2019	Process Water	0.00	0.00
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-148A	N	01/02/2019	Process Water	0.00	0.00
J3 Range	MW-637M3	MW-637M3_S19	N	01/08/2019	Ground Water	174.10	184.10
J3 Range	MW-637M2	MW-637M2_S19	N	01/08/2019	Ground Water	214.10	224.10
J3 Range	MW-637M2	MW-637M2_S19D	FD	01/08/2019	Ground Water	214.10	224.10
J3 Range	MW-637M1	MW-637M1_S19	N	01/08/2019	Ground Water	236.10	246.10
J3 Range	J3EWIP1	J3EWIP1_S19	N	01/07/2019	Ground Water	153.00	193.00
J3 Range	90EW0001	90EW0001_S19	N	01/07/2019	Ground Water	83.10	143.83
J3 Range	J3EW0032	J3EW0032_S19	N	01/07/2019	Ground Water	102.00	152.00
J3 Range	J3EW0032	J3EW0032_S19D	FD	01/07/2019	Ground Water	102.00	152.00
J3 Range	J3EWIP2	J3EWIP2_S19	N	01/07/2019	Ground Water	149.50	169.50
J3 Range	MW-636M2	MW-636M2_S19	N	01/03/2019	Ground Water	110.50	120.50
J3 Range	MW-636M1	MW-636M1_S19	N	01/03/2019	Ground Water	141.60	151.60
J3 Range	MW-653M2	MW-653M2_S19	N	01/03/2019	Ground Water	59.30	69.30
J3 Range	MW-653M1	MW-653M1_S19	N	01/03/2019	Ground Water	147.50	157.50
J3 Range	90PLT01006	90PLT01006_S19	N	01/08/2019	Process Water	0.00	0.00
J3 Range	J3-EFF	J3-EFF-148A	N	01/07/2019	Process Water	0.00	0.00
J3 Range	J3-MID-2	J3-MID-2-148A	N	01/07/2019	Process Water	0.00	0.00
J3 Range	J3-MID-1	J3-MID-1-148A	N	01/07/2019	Process Water	0.00	0.00
J3 Range	J3-INF	J3-INF-148A	N	01/07/2019	Process Water	0.00	0.00
L Range	MW-153M1	MW-153M1_S19	N	01/14/2019	Ground Water	199.00	209.00
L Range	MW-242M1	MW-242M1_S19	N	01/10/2019	Ground Water	235.00	245.00
L Range	MW-242M1	MW-242M1_S19D	FD	01/10/2019	Ground Water	235.00	245.00

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 January to 31 January 2019

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
L Range	MW-595M2	MW-595M2_S19	N	01/10/2019	Ground Water	205.30	215.30
L Range	MW-595M1	MW-595M1_S19	N	01/10/2019	Ground Water	255.30	265.30
L Range	90MW0031	90MW0031_S19	N	01/10/2019	Ground Water	195.32	200.22
L Range	MW-651M1	MW-651M1_S19	N	01/09/2019	Ground Water	242.30	252.30
L Range	MW-650M1	MW-650M1_S19	N	01/09/2019	Ground Water	260.00	270.00
L Range	MW-596M1	MW-596M1_S19	N	01/09/2019	Ground Water	231.10	241.10
L Range	90MW0034	90MW0034_S19	N	01/09/2019	Ground Water	94.00	99.00

N = Normal Sample
FD = Field Duplicate

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received January 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-709S	MW-709S_F18	106.20	116.20	12/10/2018	SW6850	Perchlorate	0.11	J	ug/L	2.0		0.012	0.20
J2 Range Eastern	MW-707S	MW-707S_F18	110.30	120.30	12/10/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.28	J	ug/L	0.60		0.036	0.20
J2 Range Eastern	MW-705M1	MW-705M1_F18	209.70	219.70	12/10/2018	SW6850	Perchlorate	0.43		ug/L	2.0		0.012	0.20
J2 Range Eastern	MW-705M1	MW-705M1_F18D	209.70	219.70	12/10/2018	SW6850	Perchlorate	0.45		ug/L	2.0		0.012	0.20
J2 Range Eastern	MW-706S	MW-706S_F18	112.70	122.70	12/07/2018	SW6850	Perchlorate	0.44		ug/L	2.0		0.012	0.20
J2 Range Northern	MW-702M1	MW-702M1_F18	277.50	287.50	12/07/2018	SW6850	Perchlorate	0.33		ug/L	2.0		0.012	0.20
J2 Range Northern	MW-703M2	MW-703M2_F18	224.10	234.10	12/07/2018	SW6850	Perchlorate	1.2		ug/L	2.0		0.012	0.20
J2 Range Northern	MW-703M1	MW-703M1_F18	248.00	258.00	12/07/2018	SW6850	Perchlorate	0.58		ug/L	2.0		0.012	0.20
J2 Range Northern	MW-704M2	MW-704M2_F18	217.80	227.80	12/06/2018	SW6850	Perchlorate	1.1		ug/L	2.0		0.012	0.20
J2 Range Northern	MW-704M1	MW-704M1_F18	244.00	254.00	12/06/2018	SW6850	Perchlorate	0.24		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-584M2	MW-584M2_F18	228.00	238.00	12/05/2018	SW6850	Perchlorate	0.085	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-584M1	MW-584M1_F18	248.00	258.00	12/05/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.070	J	ug/L	0.60		0.036	0.20
J1 Range Northern	MW-584M1	MW-584M1_F18	248.00	258.00	12/05/2018	SW6850	Perchlorate	2.3		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-541M1	MW-541M1_F18	210.00	220.00	12/04/2018	SW6850	Perchlorate	0.12	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-306M2	MW-306M2_F18	164.69	174.69	12/04/2018	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-306M1	MW-306M1_F18	184.88	194.88	12/04/2018	SW6850	Perchlorate	0.12	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8260C	m,p-Xylene	0.35	J	ug/L		X	0.35	1.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8260C	Chlorobenzene	0.37	J	ug/L		X	0.26	1.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8260C	o-Xylene	0.48	J	ug/L		X	0.23	1.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8260C	Xylenes, Total	0.83	J	ug/L		X	0.23	1.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8270D	2-Methylnaphthalene	0.88	J	ug/L		X	0.79	10.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8260C	Ethylbenzene	1.1		ug/L		X	0.33	1.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8270D	Naphthalene	1.1	J	ug/L		X	0.71	10.0
J1 Range Northern	MW-187D	MW-187D_F18	306.00	316.00	12/04/2018	SW8260C	Benzene	9.5		ug/L		X	0.43	1.0
J1 Range Northern	MW-606M1	MW-606M1_F18	233.30	243.30	12/03/2018	SW6850	Perchlorate	1.1		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-689M2	MW-689M2_F18	231.40	241.40	12/03/2018	SW6850	Perchlorate	0.57		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-689M1	MW-689M1_F18	253.50	263.50	12/03/2018	SW6850	Perchlorate	0.15	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-547M1	MW-547M1_F18	237.00	247.00	11/29/2018	SW6850	Perchlorate	1.5		ug/L	2.0		0.012	0.20
Demolition Area 2	MW-161S	MW-161S_F18	145.50	155.50	11/29/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.31		ug/L	0.60		0.036	0.20
Demolition Area 2	MW-161S	MW-161S_F18D	145.50	155.50	11/29/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.29		ug/L	0.60		0.036	0.20
Demolition Area 2	MW-160S	MW-160S_F18	137.50	147.50	11/29/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.17	J	ug/L	0.60		0.036	0.20
Demolition Area 2	MW-572M1	MW-572M1_F18	164.90	174.90	11/29/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.18	J	ug/L	0.60		0.036	0.20
Demolition Area 2	MW-573M2	MW-573M2_F18	155.40	165.40	11/28/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.30		ug/L	0.60		0.036	0.20
Demolition Area 2	MW-655M1	MW-655M1_F18	178.00	188.00	11/28/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.14	J	ug/L	0.60		0.036	0.20
J1 Range Northern	MW-245M2	MW-245M2_F18	204.00	214.00	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	39.2		ug/L	0.60	X	0.14	0.80
J1 Range Northern	MW-245M2	MW-245M2_F18	204.00	214.00	11/27/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	5.9		ug/L	400		0.025	0.20
J1 Range Northern	MW-245M2	MW-245M2_F18	204.00	214.00	11/27/2018	SW6850	Perchlorate	7.5		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-245M2	MW-245M2_F18D	204.00	214.00	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	35.9		ug/L	0.60	X	0.14	0.80
J1 Range Northern	MW-245M2	MW-245M2_F18D	204.00	214.00	11/27/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	5.7		ug/L	400		0.025	0.20
J1 Range Northern	MW-245M2	MW-245M2_F18D	204.00	214.00	11/27/2018	SW6850	Perchlorate	7.7		ug/L	2.0	X	0.012	0.20

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

MCL/HA= Either the MCL or Lowest Health Advisory Limit
February 11, 2019

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received January 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
J1 Range Northern	MW-245M1	MW-245M1_F18	244.00	254.00	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.11	J	ug/L	0.60		0.036	0.20
J1 Range Northern	MW-245M1	MW-245M1_F18	244.00	254.00	11/27/2018	SW6850	Perchlorate	0.46		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-346M3	MW-346M3_F18	175.00	185.00	11/27/2018	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-346M2	MW-346M2_F18	205.28	215.28	11/27/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.25		ug/L	400		0.025	0.20
J1 Range Northern	MW-346M2	MW-346M2_F18	205.28	215.28	11/27/2018	SW6850	Perchlorate	0.37		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-346M2	MW-346M2_F18	205.28	215.28	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	3.4		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-346M2	MW-346M2_F18D	205.28	215.28	11/27/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.26		ug/L	400		0.025	0.20
J1 Range Northern	MW-346M2	MW-346M2_F18D	205.28	215.28	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	3.4		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-346M1	MW-346M1_F18	245.00	255.00	11/27/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.060	J	ug/L	400		0.025	0.20
J1 Range Northern	MW-346M1	MW-346M1_F18	245.00	255.00	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	11.1		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-346M1	MW-346M1_F18	245.00	255.00	11/27/2018	SW6850	Perchlorate	14.1		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-346M1	MW-346M1_F18D	245.00	255.00	11/27/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.085	J	ug/L	400		0.025	0.20
J1 Range Northern	MW-346M1	MW-346M1_F18D	245.00	255.00	11/27/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	11.5		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-346M1	MW-346M1_F18D	245.00	255.00	11/27/2018	SW6850	Perchlorate	14.4		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-549M1	MW-549M1_F18	227.40	237.40	11/26/2018	SW6850	Perchlorate	3.0		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-657M2	MW-657M2_F18	208.30	218.30	11/26/2018	SW8330	Picric acid	0.11	J	ug/L	365		0.020	0.20
J1 Range Northern	MW-657M1	MW-657M1_F18	240.30	250.30	11/26/2018	SW8330	Picric acid	0.13	J	ug/L	365		0.020	0.20
J1 Range Northern	MW-369M1	MW-369M1_F18	254.07	264.07	11/26/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.15	J	ug/L	400		0.025	0.20
J1 Range Northern	MW-369M1	MW-369M1_F18	254.07	264.07	11/26/2018	SW6850	Perchlorate	0.36		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-369M1	MW-369M1_F18	254.07	264.07	11/26/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.92		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-564M1	MW-564M1_F18	227.00	237.00	11/19/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.61		ug/L	400		0.025	0.20
J1 Range Northern	MW-564M1	MW-564M1_F18	227.00	237.00	11/19/2018	SW6850	Perchlorate	14.8		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-564M1	MW-564M1_F18	227.00	237.00	11/19/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	3.1		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-564M1	MW-564M1_F18D	227.00	237.00	11/19/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.57		ug/L	400		0.025	0.20
J1 Range Northern	MW-564M1	MW-564M1_F18D	227.00	237.00	11/19/2018	SW6850	Perchlorate	14.4		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-564M1	MW-564M1_F18D	227.00	237.00	11/19/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	3.2		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-605M1	MW-605M1_F18	220.20	230.20	11/19/2018	SW6850	Perchlorate	0.043	J	ug/L	2.0		0.012	0.20
J1 Range Northern	MW-349M1	MW-349M1_F18	229.00	239.00	11/16/2018	SW6850	Perchlorate	0.51		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-349M1	MW-349M1_F18	229.00	239.00	11/16/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.84		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-326M3	MW-326M3_F18	165.24	175.26	11/16/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.18	J	ug/L	400		0.025	0.20
J1 Range Northern	MW-326M3	MW-326M3_F18	165.24	175.26	11/16/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.0		ug/L	0.60	X	0.036	0.20
J1 Range Northern	MW-326M2	MW-326M2_F18	196.27	206.28	11/16/2018	SW6850	Perchlorate	2.4		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-326M2	MW-326M2_F18	196.27	206.28	11/16/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	22.3		ug/L	0.60	X	0.072	0.40
J1 Range Northern	MW-326M2	MW-326M2_F18	196.27	206.28	11/16/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	8.7		ug/L	400		0.025	0.20
J1 Range Northern	MW-326M2	MW-326M2_F18D	196.27	206.28	11/16/2018	SW6850	Perchlorate	2.5		ug/L	2.0	X	0.012	0.20
J1 Range Northern	MW-326M2	MW-326M2_F18D	196.27	206.28	11/16/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	22.4		ug/L	0.60	X	0.072	0.40
J1 Range Northern	MW-326M2	MW-326M2_F18D	196.27	206.28	11/16/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	8.7		ug/L	400		0.025	0.20
J1 Range Northern	MW-326M1	MW-326M1_F18	250.01	260.01	11/16/2018	SW6850	Perchlorate	0.82		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-567M1	MW-567M1_F18	215.50	225.50	11/15/2018	SW6850	Perchlorate	1.8		ug/L	2.0		0.012	0.20
J1 Range Northern	MW-164M2	MW-164M2_F18	157.00	167.00	11/15/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.12	J	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
February 11, 2019

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received January 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
J1 Range Northern	MW-164M2	MW-164M2_F18	157.00	167.00	11/15/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.14	J	ug/L	0.60		0.036	0.20

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

MCL/HA= Either the MCL or Lowest Health Advisory Limit
February 11, 2019