

**MONTHLY PROGRESS REPORT #259
FOR OCTOBER 2018**

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 29 September 2018 to 26 October 2018.

1. SUMMARY OF REMEDIATION ACTIONS

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of October 2018.

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 2.598 billion gallons of water treated and re-injected as of 26 October 2018. No shut downs occurred in the October 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 2018), with over 589 million gallons of water treated and re-injected as of 26 October 2018. The following Pew Road MTU shut downs occurred in the October reporting period:

- 0317 on 29 September 2018 due to a VFD fault, and was restarted at 0730 on 01 October 2018.

The Base Boundary MTU is operating at a flow rate of 65 gpm with over 213.4 million gallons of water treated and re-injected as of 26 October 2018. No Base Boundary MTU shut downs occurred in the October reporting period.

The Leading Edge system continues to operate at a flow rate of 100 gpm. As of 26 October 2018, over 126.2 million gallons of water treated and re-injected. No Leading Edge system shut downs occurred in the October reporting period.

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 26 October 2018, over 1.049 billion gallons of water have been treated and re-injected. The following Northern Treatment Building shutdown occurred in the October reporting period:

- Unit F shut down at 1140 on 07 October 2018 due to a loss of power caused by a faulty UPS. A new UPS was installed, and the plant was restarted at 1015 on 09 October 2018.

The Northern MTUs E and F continue to operate at a flow rate of 250 gpm. As of 26 October 2018, over 1.548 billion gallons of water have been treated and re-injected. The following J-2 Range Northern MTU E or F shut downs occurred in the October reporting period:

- MTU E and F shut down at 1701 on 04 October 2018 due to a "Floor sump high" alarm, caused by a leaking hose between the lead and lag GAC vessels, and were restarted at 0844 on 05 October 2018.
- MTU E shut down at 0821 on 18 October 2018 (no alarm), and was restarted at 0932 on 18 October 2018
- MTU E shut down at 0306 on 25 October 2018 (no alarm), and was restarted at 0756 on 25 October 2018

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 26 October 2018, over 1.135 billion gallons of water have been treated and re-injected. No MTU H and I shutdowns occurred in the October reporting period.

MTU J continues to operate at a flow rate of 120 gpm. As of 26 October 2018, over 523.9 million gallons of water have been treated and re-injected. No MTU J shutdowns occurred in the October reporting period.

MTU K continues to operate at a flow rate of 125 gpm. As of 26 October 2018, over 660.4 million gallons of water have been treated and re-injected. No MTU K shutdowns occurred in the October 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 26 October 2018, over 1.165 billion gallons of water have been treated and re-injected. The following J-3 Range system shut down occurred in the October reporting period:

- Turned off at 0920 on 23 October 2018 to drain GAC Vessels #001A and #001B. CFS performed GAC exchange on 24 October 2018, and the system was restarted at 0811 on 25 October 2018,

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 26 October 2018, over 507.2 million gallons of water have been treated and re-injected. No J-1 Range Southern system shut downs occurred in the October 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 26 October 2018, over 612.0 million gallons of water have been treated and re-injected. The following J-1 Range Northern MTU shut downs occurred in the October reporting period:

- Extraction well J1NEW0002 shut down at 1945 on 11 October 2018 showing alarm code "Communication Lost" due to a PLC fault at the well panel. The plant used J1NEW0001 at 125gpm until J1NEW0002 was restarted at 0855 on 19 October 2018.

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 26 October 2018, over 1.532 billion gallons of water have been treated and re-injected. No CIA treatment facility shut downs occurred in the October reporting period.

SUMMARY OF ACTIONS TAKEN

CIA

- Performed routine inspections of BEM cover at the CIA to ensure cover is secure and intact, and demo operations.
- Completed Metalmapper recollects and conducted intrusive investigation in Phase 3 Area 1.
- Groundwater sampling within the Central Impact Area SPM program.

Small Arms Ranges

- Collected additional ISM sample from D Range grid DR158W (post-5th lift) for lead analysis.

J1 Range

- Groundwater sampling within the J1 South SPM program.
- Hydraulic monitoring within the J1 South SPM program.

J2 Range

- Groundwater sampling within the J2 East SPM program.

J3 Range

- No Activity.

Training Areas

- Collected Phase 2 ISM samples (12 total) at Former E Range for perchlorate and explosives analyses.

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 collected from Central Impact Area, J1 Range Southern, J2 Range Eastern, and J2 Range Northern.
- Soil samples were collected from D Range and Former E Range.

JBCC IAGWSP Tech Update Meeting Minutes 11 October 2018

Project and Fieldwork Update

All drilling is complete. The bladder pumps for the newly installed wells are expected to be delivered the week of October 22nd. IAGWSP suggested it was time to start to consider any additional monitoring wells that may be needed. One potential site is J-1 South, and the recent drive point location results were displayed and reviewed. It was noted that the drivepoint work was intended to help inform if supplemental treatment of some type may be warranted at the site. Several treatment ideas were discussed. IAGWSP will evaluate scenarios and provide a project note on next steps in the near future. IAGWSP will update the regulators early next week on when the project note could be completed. All treatment systems are up and running.

In the CIA, Parsons is down to three dig teams as they are running out of room to work, so they dropped from four teams to three to stay out of each other's way. Areas A and B are both 100% complete, Area C is 64% complete, Area D is 18% complete and Area E is 68% complete. The geophysical team will be doing some Metal Mapper re-shots next week. The dig update status map was displayed and reviewed. Samples will be collected as requested in grid 46-58. The team is still waiting for the LIDAR data. The scoping meeting for next steps in the CIA is scheduled for October 25th.

There has been no new fieldwork in the Training Areas since the last tech meeting. The pyrotechnics samples that were re-run without grinding are still being validated. Next steps for sampling at the Former E Range were discussed. It was noted that under the original project note, there were six grids to be sampled and the plan was if they came back low or non-detect, replicates would be collected in the six grids. A request was made by EPA to cut back on the number of replicates which would allow for some additional grids. MassDEP has now requested some deeper samples based on discussions with ORS. IAGWSP provided historical deeper data from previous investigations. It was noted that based on the conceptual site model, you would not expect concentrations to increase at depth; the higher levels are in the shallow soil. IAGWSP will forward the data from the previous investigations to MassDEP to see if that may suffice.

At the Small Arms Ranges, the stockpiled soil at C and D Range as well as the additional lifts at C Range, D Range and Former B Range will be handled by the new contractor sometime in November.

Action Items

Action items were discussed and updated.

JBCC IAGWSP Tech Update Meeting Minutes 25 October 2018

The bladder pumps for the newly installed wells have been delayed and are now expected to be delivered the week of November 4th. Long term monitoring sampling is underway in J-1 South. All treatment systems are up and running.

In the CIA, Parsons has three dig teams working, they will reduce to two teams the first week in November. Currently, two teams are in Area D and one is in Area C. Areas A and B are both 100% complete, Area C is 85% complete, Area D is 52% complete and Area E is 99% complete. The geophysical team will complete the Metal Mapper re-shots this week. The dig update status map was displayed and reviewed. The intrusive work is scheduled to be finished early December. The scoping meeting for next steps in the CIA is scheduled for after the tech meeting.

In the Training Areas, Dawson is performing sampling at the Former E Range and should be finished today. They are also taking a Small Arms Ranges sample from the western D Range grid. The new contract has been awarded and the team (KGS) should mobilize to the site in early November. They will be disposing of the stockpiled soil at C and D Range as well as performing the additional lifts at C Range, D Range and Former B. Soil from the Former B Range was shipped off-site to the Bourne Landfill in late September. EPA requested that the waste characterization results be forwarded to them.

Action Items

Action items were discussed and updated.

Central Impact Area Annual Environmental Monitoring Report – Presentation

A presentation was provided on the Central Impact Area Annual Environmental Monitoring Report. It was noted that the presentation would cover new work conducted, system performance, annual groundwater sampling results (July 2017 through June 2018) and trends, hydraulic monitoring and groundwater modeling, a comparison to Decision Document criteria, and recommendations.

New work conducted during the reporting period included the one-time sampling of shallow wells screens (M2-04M1, MW-104M2, MW-104S, MW-184M2, MW-37M3 and MW-59S), sampling of several well screens (MW-02M1, MW-100M2, MW-686M1, MW-686M2, MW-687M1, MW-687M2, and MW-695S) located within the CIA boundary and within the Northeast plume that were already recommended for sampling but had not been approved for sampling by the time the annual program was underway. In addition, the CIA-EW2 infiltration gallery was replaced with a reinjection well (IW-660) to improve the degraded capacity. The injection well was constructed using 8 inch diameter casing with 40 foot screen extending from 196-296 feet below ground surface. The well began operations on November 16, 2017. Groundwater level contours from the annual hydraulic surveys indicated that transitioning from an infiltration gallery to an injection well did not result in any appreciable change to groundwater contours/capture zone. System performance summaries with statistics for MTUs CIA 1, CIA 2 and CIA 3 were displayed and reviewed. Plots of treatment systems influent trends were displayed and discussed. Groundwater monitoring results and trends were discussed. Overall, perchlorate ranged from non-detect to 5.2 µg/L (MW-89M2). There were three well locations with concentrations above 2 µg/L. No well locations were above 15 µg/L. RDX concentrations ranged from non-detect to 12.4 µg/L (MW-89M2). There were 41 well locations with concentrations above 0.6 µg/L and 18 well locations that were above 2 µg/L. There were no well locations with RDX concentrations above 20 µg/L. Monitoring well locations, cross-sections and trend plots for perchlorate and RDX were displayed and discussed.

Two aquifer hydraulic analysis events were discussed. In October 2017, water levels ranged from 37.72' msl at MW-350M2 (north) to 53.01' msl at MW-207M2 (south). In February 2018, water levels ranged from 37.55' msl at MW-250M2 (north) to 65.34' msl at MW-487M2 (south) and the horizontal gradient in Zone 1 was approximately 0.00182 ft/ft; in Zone 2 it was 0.00368 ft/ft. Measured and model-predicted concentrations and plume figures were shown and discussed. No modifications are recommended for plant operations, sampling, wellfield extraction rates or hydraulic or chemical monitoring programs at this time.

JBCC Cleanup Team Meeting

The next JBCC Cleanup Team (JBCCCT) meeting has yet to be scheduled (previous meeting was 29 August 2018). The Cleanup Team meeting discusses late breaking news and responses to action items, as well as updates from the IAGWSP and the Installation Restoration Program (IRP). The JBCCCT meetings provide a forum for community input regarding issues related to both the IRP and the IAGWSP.

SUMMARY OF DATA RECEIVED

Table 1 summarizes sampling for all media from 1 October to 31 October 2018. Table 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 1 October to 31 October 2018. The October treatment system influent summary is not included due to no validated perchlorate 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:

- RDX and Perchlorate Attenuation Factor Study 09 Oct 18
- Monthly Progress Report No. 258 for September 2018 10 Oct 18
- Draft Demolition Area 1 2018 Annual Environmental Monitoring Report 11 Oct 18
- Draft Central Impact Area 2018 Annual Environmental Monitoring Report 12 Oct 18
- Final J-1 Range Northern and J-1 Range Southern 2018 Annual Environmental Monitoring Report 18 Oct 18

3. SCHEDULED ACTIONS

The following documents were being prepared or revised during October 2018:

Training Areas

- Final Training Areas Decision Document

Annual Reports/ Environmental Monitoring Reports/Work Plans

- Draft Demolition Area 1 Annual Monitoring Report
- Draft CIA draft Annual Monitoring Report

Central Impact Area

- 2019 Workplan

Miscellaneous

- Certificates of Compliance
- Draft Five Year Review report
- Groundwater model and project note for an active treatment alternative supporting the L Range Decision Document addendum
- J-2 Range geophysical completion of work report
- J-3 Geophysical and Soil Technical Memorandum
- PFAS sampling project note
- Recommendations for disposal of the rockets found in the CIA and on the J-2 Range
- Technology evaluation and attenuation study reports

TABLE 1
Sampling Progress: 1 October to 31 October 2018

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J1 Range Southern	MW-647M2	MW-647M2_F18	N	10/30/2018	Ground Water	189.3	199.3
Central Impact Area	CIA2-EFF	CIA2-EFF-58A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-58A	N	10/30/2018	Process Water	0	0
J1 Range Southern	MW-647M1	MW-647M1_F18	N	10/30/2018	Ground Water	211.3	221.3
J1 Range Southern	MW-647M1	MW-647M1_F18D	FD	10/30/2018	Ground Water	211.3	221.3
Central Impact Area	CIA2-MID1	CIA2-MID1-58A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-58A	N	10/30/2018	Process Water	0	0
J1 Range Southern	J1S-EW1-INF	J1S-EW1-INF_F18	N	10/30/2018	Ground Water	0	0
J1 Range Southern	J1S-EW2-INF	J1S-EW2-INF_F18	N	10/30/2018	Ground Water	0	0
Central Impact Area	CIA1-EFF	CIA1-EFF-58A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-58A	N	10/30/2018	Process Water	0	0
J1 Range Southern	MW-488PZ	MW-488PZ_F18	N	10/30/2018	Ground Water	119.3	129.3
Central Impact Area	CIA1-MID1	CIA1-MID1-58A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-58A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA3-EFF	CIA3-EFF-29A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-29A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-29A	N	10/30/2018	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-29A	N	10/30/2018	Process Water	0	0
Central Impact Area	MW-695S	MW-695S_F18	N	10/29/2018	Ground Water	130	140
Central Impact Area	MW-695S	MW-695S_F18D	FD	10/29/2018	Ground Water	130	140
J1 Range Southern	J1S-EFF	J1S-EFF-132A	N	10/29/2018	Process Water	0	0
J1 Range Southern	J1S-MID	J1S-MID-132A	N	10/29/2018	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-132A	N	10/29/2018	Process Water	0	0
J1 Range Southern	MW-592M2	MW-592M2_F18	N	10/29/2018	Ground Water	158	168
J3 Range	J3-EFF	J3-EFF-146A	N	10/29/2018	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-146A	N	10/29/2018	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-146A	N	10/29/2018	Process Water	0	0
J3 Range	J3-INF	J3-INF-146A	N	10/29/2018	Process Water	0	0
J1 Range Southern	MW-592M1	MW-592M1_F18	N	10/29/2018	Ground Water	201	211
J1 Range Southern	MW-645M2	MW-645M2_F18	N	10/29/2018	Ground Water	143.5	153.5
J1 Range Southern	MW-645M1	MW-645M1_F18	N	10/29/2018	Ground Water	183.5	193.5

N = Normal Sample
FD = Field Duplicate

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Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J1 Range Southern	MW-645M1	MW-645M1_F18D	FD	10/29/2018	Ground Water	183.5	193.5
J1 Range Southern	MW-398M2	MW-398M2_F18	N	10/25/2018	Ground Water	131.53	141.53
J1 Range Southern	MW-398M1	MW-398M1_F18	N	10/25/2018	Ground Water	172.15	182.15
Former E Range	SSEH17	E_H17_D	N	10/25/2018	Soil	0.5	1
Former E Range	SSEH17	E_H17_C	FD	10/25/2018	Soil	0	0.25
Former E Range	SSEH17	E_H17_B	N	10/25/2018	Soil	0	0.25
J1 Range Southern	DP-379	DP-379_F18	N	10/25/2018	Ground Water	184.3	189.3
Former E Range	SSEE11	E_E11_D	N	10/25/2018	Soil	0.5	1
Former E Range	SSEE11	E_E11_C	FD	10/25/2018	Soil	0	0.25
Former E Range	SSEE11	E_E11_B	N	10/25/2018	Soil	0	0.25
Former E Range	SSED7	E_D7_A	N	10/25/2018	Soil	0	0.25
Former E Range	SSEF5	E_F5_D	N	10/25/2018	Soil	0.5	1
Former E Range	SSEF5	E_F5_C	FD	10/25/2018	Soil	0	0.25
Former E Range	SSEF5	E_F5_B	N	10/25/2018	Soil	0	0.25
Former E Range	SSEE3	E_E3_A	N	10/25/2018	Soil	0	0.25
J1 Range Southern	MW-481M2	MW-481M2_F18	N	10/24/2018	Ground Water	146.28	156.28
J1 Range Southern	MW-481M1	MW-481M1_F18	N	10/24/2018	Ground Water	189.74	199.74
J1 Range Southern	MW-480M2	MW-480M2_F18	N	10/24/2018	Ground Water	143.57	153.57
J1 Range Southern	MW-482M3	MW-482M3_F18	N	10/24/2018	Ground Water	98.18	108.18
J1 Range Southern	MW-482M2	MW-482M2_F18	N	10/24/2018	Ground Water	172.64	182.64
J1 Range Southern	MW-482M2	MW-482M2_F18D	FD	10/24/2018	Ground Water	172.64	182.64
Former E Range	SSEC14	E_C14_A	N	10/24/2018	Soil	0	0.25
D Range	SDDR158WEST	DR158W_B	N	10/24/2018	Soil	0	0.25
J1 Range Southern	MW-488M1	MW-488M1_F18	N	10/23/2018	Ground Water	149.62	159.62
J1 Range Southern	MW-483M1	MW-483M1_F18	N	10/23/2018	Ground Water	139.52	149.52
J1 Range Southern	MW-528M1	MW-528M1_F18	N	10/23/2018	Ground Water	117	127
J1 Range Southern	MW-360M2	MW-360M2_F18	N	10/23/2018	Ground Water	102	112
J1 Range Southern	MW-360M2	MW-360M2_F18D	FD	10/23/2018	Ground Water	102	112
J1 Range Southern	MW-131S	MW-131S_F18	N	10/23/2018	Ground Water	96	106
Central Impact Area	MW-441M2	MW-441M2_F18	N	10/18/2018	Ground Water	109.5	119.5
Central Impact Area	MW-616M1	MW-616M1_F18	N	10/18/2018	Ground Water	217.1	227.1

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Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
Central Impact Area	MW-617M1	MW-617M1_F18	N	10/18/2018	Ground Water	175.8	185.8
Central Impact Area	MW-623M3	MW-623M3_F18	N	10/17/2018	Ground Water	275	285
Central Impact Area	MW-623M2	MW-623M2_F18	N	10/17/2018	Ground Water	291.8	301.8
Central Impact Area	MW-623M1	MW-623M1_F18	N	10/17/2018	Ground Water	340	350
Central Impact Area	MW-624M2	MW-624M2_F18	N	10/16/2018	Ground Water	254	264
Central Impact Area	MW-624M1	MW-624M1_F18	N	10/16/2018	Ground Water	284	294
Central Impact Area	MW-625M2	MW-625M2_F18	N	10/16/2018	Ground Water	230	240
Central Impact Area	MW-625M1	MW-625M1_F18	N	10/16/2018	Ground Water	260	270
J2 Range Eastern	MW-307M3	MW-307M3_F18	N	10/15/2018	Ground Water	125.8	135.82
J2 Range Eastern	MW-319M2	MW-319M2_F18	N	10/15/2018	Ground Water	165.17	175.17
J2 Range Eastern	MW-319M1	MW-319M1_F18	N	10/15/2018	Ground Water	200.25	210.25
J2 Range Eastern	MW-324M2	MW-324M2_F18	N	10/15/2018	Ground Water	203.74	214.74
J2 Range Northern	MW-324M2	MW-324M2_F18	N	10/15/2018	Ground Water	203.74	214.74
J2 Range Eastern	MW-324M1	MW-324M1_F18	N	10/15/2018	Ground Water	234.85	244.85
J2 Range Eastern	MW-170M2	MW-170M2_F18	N	10/11/2018	Ground Water	198	208
J2 Range Eastern	MW-170M1	MW-170M1_F18	N	10/11/2018	Ground Water	265	275
J2 Range Eastern	MW-321M2	MW-321M2_F18	N	10/11/2018	Ground Water	155.67	165.67
J2 Range Eastern	MW-321M1	MW-321M1_F18	N	10/11/2018	Ground Water	174.61	184.61
J2 Range Eastern	J2MW-01M2	J2MW-01M2_F18	N	10/10/2018	Ground Water	245	255
J2 Range Eastern	J2MW-01M1	J2MW-01M1_F18	N	10/10/2018	Ground Water	275	285
J2 Range Eastern	J2MW-02PZ	J2MW-02PZ_F18	N	10/10/2018	Ground Water	191	201
J2 Range Eastern	J2MW-02M2	J2MW-02M2_F18	N	10/10/2018	Ground Water	236	246
J2 Range Eastern	J2MW-02M1	J2MW-02M1_F18	N	10/10/2018	Ground Water	271	281
J2 Range Eastern	MW-357M1	MW-357M1_F18	N	10/09/2018	Ground Water	274.51	284.51
J2 Range Eastern	MW-215M2	MW-215M2_F18	N	10/09/2018	Ground Water	205	215
J2 Range Eastern	MW-215M1	MW-215M1_F18	N	10/09/2018	Ground Water	240	250
J2 Range Eastern	MW-351M2	MW-351M2_F18	N	10/09/2018	Ground Water	233.67	243.67
J2 Range Eastern	MW-351M1	MW-351M1_F18	N	10/09/2018	Ground Water	278.64	288.64
Demolition Area 1	PR-EFF	PR-EFF-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	PR-MID-2	PR-MID-2-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	PR-MID-1	PR-MID-1-151A	N	10/04/2018	Process Water	0	0

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TABLE 1
Sampling Progress: 1 October to 31 October 2018

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	PR-INF	PR-INF-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-151A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1LE-EFF	D1LE-EFF-27A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1LE-MID2	D1LE-MID2-27A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-27A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-27A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1-EFF	D1-EFF-99A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-99A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-99A	N	10/04/2018	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-99A	N	10/04/2018	Process Water	0	0
J2 Range Eastern	MW-310M1	MW-310M1_F18	N	10/03/2018	Ground Water	171.4	181.4
J3 Range	J3-EFF	J3-EFF-145A	N	10/03/2018	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-145A	N	10/03/2018	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-145A	N	10/03/2018	Process Water	0	0
J3 Range	J3-INF	J3-INF-145A	N	10/03/2018	Process Water	0	0
J1 Range Southern	J1S-EFF	J1S-EFF-131A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	MW-354M2	MW-354M2_F18	N	10/03/2018	Ground Water	234.8	244.8
J1 Range Southern	J1S-MID	J1S-MID-131A	N	10/03/2018	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-131A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	MW-354M1	MW-354M1_F18	N	10/03/2018	Ground Water	274.52	284.52
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	MW-335M2	MW-335M2_F18	N	10/03/2018	Ground Water	215.25	225.25
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-121A	N	10/03/2018	Process Water	0	0

N = Normal Sample
FD = Field Duplicate

TABLE 1
Sampling Progress: 1 October to 31 October 2018

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	J2E-INF-J	J2E-INF-J-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	MW-335M1	MW-335M1_F18	N	10/03/2018	Ground Water	255.2	265.2
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-121A	N	10/03/2018	Process Water	0	0
J2 Range Eastern	MW-372M1	MW-372M1_F18	N	10/02/2018	Ground Water	273.05	283.05
J2 Range Eastern	MW-334M1	MW-334M1_F18	N	10/02/2018	Ground Water	285	295
Central Impact Area	CIA2-EFF	CIA2-EFF-57A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-57A	N	10/02/2018	Process Water	0	0
J2 Range Eastern	MW-665M3	MW-665M3_F18	N	10/02/2018	Ground Water	175.2	185.2
J2 Range Eastern	MW-665M3	MW-665M3_F18D	FD	10/02/2018	Ground Water	175.2	185.2
Central Impact Area	CIA2-MID1	CIA2-MID1-57A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-57A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA1-EFF	CIA1-EFF-57A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-57A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-57A	N	10/02/2018	Process Water	0	0
J2 Range Eastern	MW-665M2	MW-665M2_F18	N	10/02/2018	Ground Water	205.2	215.2
J2 Range Eastern	MW-665M2	MW-665M2_F18D	FD	10/02/2018	Ground Water	205.2	215.2
Central Impact Area	CIA1-INF	CIA1-INF-57A	N	10/02/2018	Process Water	0	0
J2 Range Eastern	MW-665M1	MW-665M1_F18	N	10/02/2018	Ground Water	225.2	235.2
Central Impact Area	CIA3-EFF	CIA3-EFF-28A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-28A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-28A	N	10/02/2018	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-28A	N	10/02/2018	Process Water	0	0
J2 Range Eastern	MW-667M2	MW-667M2_F18	N	10/01/2018	Ground Water	277.3	287.3
J2 Range Eastern	MW-667M2	MW-667M2_F18D	FD	10/01/2018	Ground Water	277.3	287.3
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-145A	N	10/01/2018	Process Water	0	0

N = Normal Sample
 FD = Field Duplicate

TABLE 1
Sampling Progress: 1 October to 31 October 2018

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-145A	N	10/01/2018	Process Water	0	0
J2 Range Eastern	MW-667M1	MW-667M1_F18	N	10/01/2018	Ground Water	302.3	312.3
J2 Range Eastern	MW-667M1	MW-667M1_F18D	FD	10/01/2018	Ground Water	302.3	312.3
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-145A	N	10/01/2018	Process Water	0	0
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-145A	N	10/01/2018	Process Water	0	0
J2 Range Eastern	MW-393M2	MW-393M2_F18	N	10/01/2018	Ground Water	218.16	228.16
J1 Range Northern	J1N-EFF	J1N-EFF-60A	N	10/01/2018	Process Water	0	0
J1 Range Northern	J1N-MID2	J1N-MID2-60A	N	10/01/2018	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-60A	N	10/01/2018	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-60A	N	10/01/2018	Process Water	0	0
J2 Range Eastern	MW-393M1	MW-393M1_F18	N	10/01/2018	Ground Water	268.02	278.02
J2 Range Eastern	MW-393D	MW-393D_F18	N	10/01/2018	Ground Water	313.56	323.56

N = Normal Sample
 FD = Field Duplicate

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 2018

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	J2EW0003	J2EW0003_F18	202	232	09/19/2018	SW6850	Perchlorate	0.41	J	ug/L	2.0		0.082	0.50
J2 Range Northern	J2EW0002	J2EW0002_F18	198	233	09/19/2018	SW6850	Perchlorate	4.4		ug/L	2.0	X	0.082	0.50
J2 Range Northern	J2EW0002	J2EW0002_F18D	198	233	09/19/2018	SW6850	Perchlorate	4.5		ug/L	2.0	X	0.082	0.50
J2 Range Northern	J2EW0001	J2EW0001_F18	179	234	09/19/2018	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.089	J	ug/L	0.60		0.036	0.20
J2 Range Northern	J2EW0001	J2EW0001_F18	179	234	09/19/2018	SW6850	Perchlorate	1.1		ug/L	2.0		0.082	0.50
J2 Range Northern	MW-300M2	MW-300M2_F18	197.2	207.2	09/19/2018	SW6850	Perchlorate	0.15	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-586M2	MW-586M2_F18	211	221	09/18/2018	SW6850	Perchlorate	0.33	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-586M1	MW-586M1_F18	237	247	09/18/2018	SW6850	Perchlorate	9.4		ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-586M1	MW-586M1_F18D	237	247	09/18/2018	SW6850	Perchlorate	9.0		ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-130S	MW-130S_F18	103	113	09/17/2018	SW6850	Perchlorate	0.14	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-130S	MW-130S_F18	103	113	09/17/2018	SW8330	2-Amino-4,6-dinitrotoluene	0.26		ug/L	7.3		0.016	0.20
J2 Range Northern	MW-130S	MW-130S_F18	103	113	09/17/2018	SW8330	4-Amino-2,6-dinitrotoluene	0.65		ug/L	7.3		0.015	0.20
J2 Range Northern	MW-293M2	MW-293M2_F18	196.4	206.4	09/17/2018	SW6850	Perchlorate	0.19	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-313M1	MW-313M1_F18	255.4	265.4	09/13/2018	SW6850	Perchlorate	11.1		ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-313M1	MW-313M1_F18D	255.4	265.4	09/13/2018	SW6850	Perchlorate	11.2		ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-234M2	MW-234M2_F18	110	120	09/12/2018	SW8330	2,4-Dinitrotoluene	0.16	J	ug/L	5.0		0.054	0.20
J2 Range Northern	MW-234M2	MW-234M2_F18	110	120	09/12/2018	SW8330	4-Amino-2,6-dinitrotoluene	0.41		ug/L	7.3		0.015	0.20
J2 Range Northern	MW-234M2	MW-234M2_F18	110	120	09/12/2018	SW8330	2-Amino-4,6-dinitrotoluene	1.2		ug/L	7.3		0.016	0.20
J2 Range Northern	MW-234M2	MW-234M2_F18	110	120	09/12/2018	SW8330	2,4,6-Trinitrotoluene	1.6		ug/L	2.0		0.027	0.20
J2 Range Northern	MW-234M1	MW-234M1_F18	130	140	09/12/2018	SW8330	2,4-Dinitrotoluene	0.11	J	ug/L	5.0		0.054	0.20
J2 Range Northern	MW-234M1	MW-234M1_F18	130	140	09/12/2018	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.18	J	ug/L	400		0.025	0.20
J2 Range Northern	MW-234M1	MW-234M1_F18	130	140	09/12/2018	SW8330	4-Amino-2,6-dinitrotoluene	0.38		ug/L	7.3		0.015	0.20
J2 Range Northern	MW-234M1	MW-234M1_F18	130	140	09/12/2018	SW6850	Perchlorate	0.48	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-234M1	MW-234M1_F18	130	140	09/12/2018	SW8330	2-Amino-4,6-dinitrotoluene	0.61		ug/L	7.3		0.016	0.20
J2 Range Northern	MW-234M1	MW-234M1_F18	130	140	09/12/2018	SW8330	2,4,6-Trinitrotoluene	2.1		ug/L	2.0	X	0.027	0.20
J2 Range Northern	MW-327M2	MW-327M2_F18	265	275	09/12/2018	SW6850	Perchlorate	0.70		ug/L	2.0		0.082	0.50
J2 Range Northern	MW-589M2	MW-589M2_F18	211	221	09/11/2018	SW6850	Perchlorate	6.4		ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-589M2	MW-589M2_F18D	211	221	09/11/2018	SW6850	Perchlorate	6.5		ug/L	2.0	X	0.082	0.50
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_F18	240.8	250.8	09/11/2018	SW6850	Perchlorate	3.1		ug/L	2.0	X	0.082	0.50
J2 Range Northern	J2EW3-MW1-C	J2EW3-MW1-C_F18	245.7	255.7	09/10/2018	SW6850	Perchlorate	5.1		ug/L	2.0	X	0.082	0.50
J2 Range Northern	J2EW3-MW1-C	J2EW3-MW1-C_F18D	245.7	255.7	09/10/2018	SW6850	Perchlorate	5.1		ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-337M1	MW-337M1_F18	243.71	253.71	09/06/2018	SW6850	Perchlorate	0.11	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-296M1	MW-296M1_F18	255.1	265.1	08/29/2018	SW6850	Perchlorate	0.46		ug/L	2.0		0.082	0.50
J2 Range Northern	J2EW2-MW3-B	J2EW2-MW3-B_F18	212.7	222.7	08/29/2018	SW6850	Perchlorate	1.5		ug/L	2.0		0.082	0.50
J2 Range Northern	MW-587M2	MW-587M2_F18	220	230	08/28/2018	SW6850	Perchlorate	68.6	J	ug/L	2.0	X	0.82	5.0
J2 Range Northern	MW-587M2	MW-587M2_F18D	220	230	08/28/2018	SW6850	Perchlorate	68.7	J	ug/L	2.0	X	0.82	5.0
J2 Range Northern	MW-587M1	MW-587M1_F18	250	260	08/28/2018	SW6850	Perchlorate	10.5	J	ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-640M2	MW-640M2_F18	216	226	08/28/2018	SW6850	Perchlorate	1.7	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-640M1	MW-640M1_F18	246	256	08/28/2018	SW6850	Perchlorate	7.5	J	ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-622M2	MW-622M2_F18	220.4	230.4	08/28/2018	SW6850	Perchlorate	2.9	J	ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-622M1	MW-622M1_F18	245.4	255.4	08/28/2018	SW6850	Perchlorate	0.32	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-348M2	MW-348M2_F18	206.5	216.5	08/27/2018	SW6850	Perchlorate	0.16	J	ug/L	2.0		0.082	0.50

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

MCL/HA= Either the MCL or Lowest Health Advisory Limit
November 07, 2018

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received October 2018

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-621M2	MW-621M2_F18	219.4	229.4	08/27/2018	SW6850	Perchlorate	3.0	J	ug/L	2.0	X	0.082	0.50
J2 Range Northern	MW-631M2	MW-631M2_F18	200.1	210.1	08/27/2018	SW6850	Perchlorate	0.17	J	ug/L	2.0		0.082	0.50
J2 Range Northern	MW-631M1	MW-631M1_F18	233.1	243.1	08/27/2018	SW6850	Perchlorate	0.19	J	ug/L	2.0		0.082	0.50

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