

**MONTHLY PROGRESS REPORT #228  
FOR MARCH 2016**

**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 March to 31 March 2016.

**1. SUMMARY OF REMEDIATION ACTIONS**

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of March 2016. Remediation Actions may include Rapid Response Actions (RRA). An RRA is an interim action that may be conducted prior to risk assessments or remedial investigations to address a known, ongoing threat of contamination to groundwater and/or soil.

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, and the Base Boundary 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 250 gpm, with over 2.337 billion gallons of water treated and re-injected as of 1 April 2016. The following Frank Perkins Road facility shut down occurred in March:

- Extraction well (EW-501) was shut down on 29 March 2016 at 0745 to replace the pump and motor and was restarted on 31 March 2016 at 1115.

The Pew Road Mobile Treatment Unit (MTU) continues to operate at a flow rate of 105 gpm with over 460.2 million gallons of water treated and re-injected as of 1 April 2016. The following Pew Road MTU shut downs occurred in March:

- Shut down on 2 March 2016 at 0318 due to a power outage and was restarted on 2 March 2016 at 0730;
- Shut down on 5 March 2016 at 0611 due to a power outage and was restarted on 7 March 2016 at 0725;
- Shut down on 7 March 2016 at 0725 due to a power outage and was restarted on 7 March 2016 at 1303; and
- Shut down on 31 March 2016 at 1001 due to a power interruption and was restarted on 31 March 2016 at 1149.

The Base Boundary RA was operating at a flow rate of 65 gpm with over 146.9 million gallons of water treated and re-injected as of 1 April 2016. The following Base Boundary MTU shut downs occurred in March:

- Shut down on 2 March 2016 at 0249 due to a power outage and was restarted on 2 March 2016 at 1244; and
- Shut down on 8 March 2016 at 1054 for system repairs and was restarted on 8 March 2016 at 1304.

### 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 1 April 2016, over 337 million gallons of water have been treated and re-injected. No J-1 Range Southern system shut downs occurred in March.

#### 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 will continue to operate at a total system flow rate of 250 gpm. As of 1 April 2016, over 286 million gallons of water have been treated and re-injected. The following J-1 Range Northern MTU shut down occurred in March:

- Extraction well EW-0001 was shut down on 27 March 2016 at 0839 due to a system alarm and was restarted on 28 March 2016 at 0931.

### J-3 Range Groundwater RRA

The J-3 Range Groundwater RRA consists of removal and treatment of contaminated groundwater to control further migration of explosives compounds and perchlorate. The ETR system includes three 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 continues to operate at a flow rate of 195 gpm. As of 1 April 2016, over 889.7 million gallons of water have been treated and re-injected. No J-3 Range system shut downs occurred in March.

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 1 April 2016, over 747.5 million gallons of water have been treated and re-injected. The following Northern Treatment Building shut down occurred in March:

- Shut down on 2 March 2016 at 0259 due to a power outage and was restarted on 2 March 2016 at 0801.

The Northern MTUs E and F continue to operate at a flow rate of 250 gpm. As of 1 April 2016, over 1.204 billion gallons of water have been treated and re-injected. The following J-2 Range Northern MTU shut downs occurred in March:

- MTU E shut down on 2 March 2016 at 0303 due to a power outage and was restarted on 2 March 2016 at 1040; and
- MTU F shut down on 2 March 2016 at 0302 due to a power outage and was restarted on 2 March 2016 at 0752.

## 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 1 April 2016, over 824.5 million gallons of water have been treated and re-injected. The following MTU H and I shut downs occurred in March:

- MTUs H and I shut down on 8 March 2016 at 0937 for system repairs and were restarted on 8 March 2016 at 0947; and
- MTUs H and I shut down on 27 March 2016 at 2014 due to a system alarm and were restarted on 28 March 2016 at 0931.

MTU J continues to operate at a flow rate of 120 gpm. As of 1 April 2016, over 367 million gallons of water have been treated and re-injected. The following shut down of MTU J occurred in March:

- MTU J shut down on 4 March 2016 at 0926 due to a system alarm and was restarted on 7 March 2016 at 1418.

MTU K continues to operate at a flow rate of 125 gpm. As of 1 April 2016, over 472 million gallons of water have been treated and re-injected. No MTU K shut downs occurred in March.

### 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: two 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 two infiltration galleries to return treated water to the aquifer. The CIA systems 1 and 2 continue to run at a combined total flow rate of 500 gpm. As of 1 April 2016, over 572 million gallons of water have been treated and re-injected. No CIA treatment facility shutdowns occurred in March.

### **SUMMARY OF ACTIONS TAKEN**

Samples collected during the reporting period are summarized in Table 1.

Process water samples were collected at Frank Perkins Road, Pew Road, Base Boundary, J-1 Range Southern, J-1 Range Northern, J-2 Range Northern, J-2 Range Eastern, J-3 Range, and Central Impact Area (CIA).

Environmental and system performance monitoring groundwater samples were collected at CIA, J-1 Range Northern, Western Boundary, and CS-19.

Collected horizontal delineation soil samples from D Range, Former B Range, and Former N Range.

Surveyed and developed new monitoring wells.

Completed vegetative clearance and UXO clearance in soil excavation areas at J-2 Range. Completed vegetative clearance in the Barrage Rocket MEC investigation Area at J-3 Range. Completed vegetative clearance and UXO clearance in soil excavation areas at U Range in the Training Areas.

Delivered pipe to the J3-IP2 location, installed tie-in to the J-3 Range treatment system, and continued trenching for subsurface pipe and electrical installation.

Completed construction of influent pipeline and continued underground electrical line utility hookup for the CIA treatment system. Installed Extraction well EW-3 pump.

Installed and developed Demolition Area 1 Leading Edge treatment system extraction well, and constructed MTU pad.

Performed daily inspection of BEM cover at the CIA to ensure cover is secure and intact. Mobilized metalmapper and unexploded ordnance (UXO) dig team.

## **JBCC IAGWSP Tech Update Meeting Minutes 10 March 2016**

### **Project and Field Work Update**

Construction activities continue at the CIA EW-3 groundwater treatment system. Discussions are ongoing with Eversource to determine the schedule for the installation of electric power. Eversource has indicated that the earliest they can guarantee power is April 12, however they will do everything than can to try and meet the requested date of March 29. The contractor has been working with their electrician to determine what would be necessary should an alternate power source (i.e. a generator) be needed in order to meet the system start-up milestone (March 30). All but one of the poles have been installed. The influent pipeline has been completed. The electric conduit is finished and the majority of the wires have been pulled. The reinjection gallery is complete. The fiber optics need to be pulled. The mobile treatment unit (MTU) was inspected and will be delivered on March 21. The equipment to start well development has been staged.

At the Demolition Area 1 off-site treatment system, development of the extraction well finished yesterday. Next, they will move to prep the pad for the MTU. The influent gallery and pipeline are in. The locations for the electric poles have been marked out. Trenching for the pipeline back to the plant for the Demolition Area 1 source area extraction well will begin next week. USACE indicated that they will be coordinating closely with Natural Resources because there is a prescribed burn event scheduled in the area. The treatment train at Demolition Area 1 Frank Perkins Road plant is being dismantled. There is a site visit schedule for Friday to the proposed J-2 eastern monitoring well locations to make sure that they are in constructible locations and to determine the level of effort required for UXO support. The J-3 Range extraction well has been developed and construction of the pipeline will begin after the Demolition Area 1 pipeline is finished.

At the Small Arms Ranges, samples were collected at the Former B and Former D Ranges. An XRF survey was completed around the Former N Range berms last week. Towards the end of March, Dawson UXO and Metal Mapper teams will re-mob to the site. Metal Mapper will finish in Phase II Area 2 and Dawson will resume digging in Phase II Area 1.

### **J-2 Range Post-DD Soil/Geophysical Results Project Note**

Discussion was held on EPA comments on the J-2 Range Post-DD soil and geophysical results project note. It was noted that while most comments had been settled, there was a disagreement on the scope of follow-on activities. Based on the results of the meandering path and UXO surveys around grids L-19 through L-22, IAGWSP proposed doing additional work in a few grids.

EPA indicated that they feel that an area of 100% clearance should be expanded to envelop the suspected area for the source of the plume. IAGWSP will provide responses to comments with a revised proposal for additional grids

### **Action Items**

The action items were discussed and updated.

**JBCC IAGWSP Tech Update Meeting Minutes 31 March 2016****Project and Field Work Update**

Construction activities continue at the CIA EW-3 groundwater treatment system. Eversource has not completed the connection to power. IAGWSP's contractor brought a portable generator onsite in an attempt to start the system on March 30 in order to meet the enforceable milestone. Unfortunately, when they started the system they received an error and the variable frequency drive on the pump wouldn't start. There was concern that if the system started at the full rate, the pipeline may be damaged. While Eversource continues to work on the power connections, IAGWSP will begin the ambient water table monitoring on Monday, April 4<sup>th</sup> in anticipation of getting permanent power connected within a week. At that point, they will start the system on Monday, April 11 and complete the aquifer drawdown monitoring according to the startup plan. IAGWSP will inform EPA and MassDEP if Eversource is not able to connect power next week.

At the Demolition Area 1 off-site treatment system, the mobile treatment unit is on site and in place. The water, influent, effluent and pipeline are in. The locations for the electric poles have been marked out, however Eversource still needs to install the pole and bring the power to the site.

Trenching for the pipeline back to the plant for the Demolition Area 1 source area extraction well will begin next week.

At the Central Impact Area, Dawson UXO and Metal Mapper teams returned to the site this week. Dawson will begin requiring targets in Phase 2 Area 1, Metal Mapper will begin siting on targets as early as today.

At the Small Arms Ranges, H&S finished the excavation of the initial lists at six Small Arms Ranges. Excavations were completed at Former N, Former B, Former C and Former D Ranges. Vegetation clearance will begin at the Former B and Former D Ranges next week with soil excavation shortly thereafter.

**Central Impact Area - Results of 100% Dig-Validation Presentation**

A presentation was provided to provide the results of the 100% dig validation conducted in grid 47-39 and update the current status of the project. Ms. Walker reminded the group of the Decision Document goal of removing 75-95% of the UXO while maximizing the removal of net explosive weight and the classification goals of correctly classifying 95% of targets of interest (TOI) while reducing clutter digs by >70%. In grid 47-39, there were 515 EM61 anomaly locations with Metal

Mapper cued data collection. Of these, 222 met dig criteria, 6 had multiple dig locations which equaled 228 likely TOI digs. The recommended dig rate was 43%. The remaining 293 were dug for QA for a total of 521 digs. Forty-eight TOI were recovered.

For the "clutter" digs, 39% of the clutter was incorrectly classified as likely-TOI (185 digs that could have been safely left in ground). This did not meet the goal of reduction of clutter digs by 70%. This was caused by the nature of the clutter with the average number of items in single clutter 'dig': 12.7 and the average weight of munitions debris from clutter 'dig': 5 lb. The number of items and weight of correctly classified clutter was generally much smaller. This higher than anticipated clutter dig rate is unavoidable in the conditions of this grid.

The intrusive TOI miss and incorrectly classified TOI were discussed. The intrusive TOI miss was an empty 75mm that was likely in the sidewall of another excavation and masked by nearby TOI. The two incorrectly classified TOI were an 81mm illumination body and a 4.2" illumination body; both were too deep for consistent classification.

The combined results of all of the 100% dig tests, which include the ESTCP project and six quarter-acre grids, showed that only two UXO items were missed (1 partial 81mm, 1 very deep 81mm). This far exceeds DD requirement for removal of 75-95% net explosive weight and meets the classification goals of 95% TOI & 70% reduction in clutter digs.

EPA will provide a suggestion for the next 100% dig grid.

### **L Range Plume Shell**

Discussion was held on the new plume shell that was developed for the L Range Plume. It was noted that the plume shell had not been updated since 2004 and the data cutoff for the new one was November of 2015. Figures were shown depicting the forward particle tracks, extent of plumes and migrated plume contours at various depths. EPA suggested it might be valuable to sample AFCECs FS-12 extraction wells. IAGWSP agreed to do so. The new plume shell will be included in the upcoming L Range monitoring report, scheduled for the end of April.

### **Action Items**

The action items were discussed and updated.

### **JBCC Cleanup Team Meeting**

The JBCC Cleanup Team (JBCCCT), formerly the MMR Cleanup Team (MMRCT) is next scheduled to meet next on May 11, 2016. 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 2 summarizes the validated detections of explosives compounds and perchlorate for all groundwater results received from 1 March to 31 March 2016. 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.

There are currently twelve operable units (OU) 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. 227 for February 2016 03/10/2016
- Final Western Boundary Demonstration of Compliance Report 03/11/2016
- Final J-2 Range Eastern and J-2 Range Northern 2015 Environmental Monitoring Report 03/11/2016
- Final Central Impact Area 2015 Annual Environmental Monitoring Report 03/17/2016
- Changes to the J-3 Range Chemical Monitoring Well Network – Project Note 03/23/2016
- Fifth Addendum to May 2014 Project Note for “Sampling, Soil Removal, and Monitoring at the Small Arms Ranges” – Project Note 03/31/2016
- Demolition Area 1 – Proposed Sampling/Borings – Project Note 03/31/2016

## 3. SCHEDULED ACTIONS

The following documents are being prepared or revised during April 016:

- J-2 Range Project Note for Additional Wells to Evaluate Source Response;
- J-2 Range Intrusive Investigation Project Note
- Training Areas Draft Investigation Report;
- Training Areas Draft Remedy Selection Plan;
- CIA Environmental Monitoring Work Plan;
- CIA Draft 2015 Source Removal Annual Report; and
- Draft BIP Report;
- L Range 2016 Environmental Monitoring Report; and
- J-1 Range Northern and J-1 Range Southern 2016 Environmental Monitoring Report



**TABLE 1**  
**Sampling Progress: 29 February - 31 March 2016**

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-102M2	MW-102M2_S16	N	03/30/2016	Ground Water	237	247
D Range	DR08	DR08_C	FR	03/30/2016	Soil	0	0.25
Central Impact Area	MW-50M1	MW-50M1_S16	N	03/30/2016	Ground Water	207	217
Central Impact Area	MW-50M1	MW-50M1_S16D	FD	03/30/2016	Ground Water	207	217
D Range	DR09	DR09_A	N	03/30/2016	Soil	0	0.25
Central Impact Area	MW-625M2	MW-625M2_S16	N	03/30/2016	Ground Water	230	240
D Range	DR08	DR08_B	FR	03/30/2016	Soil	0	0.25
D Range	DR08	DR08_A	N	03/30/2016	Soil	0	0.25
D Range	DR07	DR07_A	N	03/30/2016	Soil	0	0.25
D Range	DR06	DR06_A	N	03/30/2016	Soil	0	0.25
Central Impact Area	MW-625M1	MW-625M1_S16	N	03/30/2016	Ground Water	260	270
Former B Range	FBR23	FBR23_A	N	03/30/2016	Soil	0	0.25
Central Impact Area	MW-633M2	MW-633M2_S16	N	03/30/2016	Ground Water	197	207
Former B Range	FBR22	FBR22_A	N	03/30/2016	Soil	0	0.25
Former B Range	FBR21	FBR21_A	N	03/30/2016	Soil	0	0.25
Central Impact Area	MW-633M1	MW-633M1_S16	N	03/30/2016	Ground Water	282	292
Former B Range	FBR20	FBR20_A	N	03/30/2016	Soil	0	0.25
Former B Range	FBR19	FBR19_A	N	03/30/2016	Soil	0	0.25
Former B Range	FBR18	FBR18_C	FR	03/30/2016	Soil	0	0.25
Former B Range	FBR18	FBR18_B	FR	03/30/2016	Soil	0	0.25
Former B Range	FBR18	FBR18_A	N	03/30/2016	Soil	0	0.25
Central Impact Area	MW-617M2	MW-617M2_S16	N	03/29/2016	Ground Water	118.3	128.3
Central Impact Area	MW-617M1	MW-617M1_S16	N	03/29/2016	Ground Water	175.8	185.8
Central Impact Area	MW-616M2	MW-616M2_S16	N	03/29/2016	Ground Water	107.1	117.1
Central Impact Area	MW-616M1	MW-616M1_S16	N	03/29/2016	Ground Water	217.1	227.1
CS-19 (ARNG)	MW-17S	MW-17S_S16	N	03/29/2016	Ground Water	120	130
CS-19 (ARNG)	MW-53S	MW-53S_S16	N	03/29/2016	Ground Water	121.2	131.2
Central Impact Area	MW-108M4	MW-108M4_S16	N	03/28/2016	Ground Water	240	250
Central Impact Area	MW-108M1	MW-108M1_S16	N	03/28/2016	Ground Water	297	307
Central Impact Area	MW-123M2	MW-123M2_S16	N	03/28/2016	Ground Water	236	246
Central Impact Area	MW-123M1	MW-123M1_S16	N	03/28/2016	Ground Water	291	301
Central Impact Area	MW-615M2	MW-615M2_S16	N	03/28/2016	Ground Water	200	210
Central Impact Area	MW-615M1	MW-615M1_S16	N	03/28/2016	Ground Water	260	270
Central Impact Area	MW-615M1	MW-615M1_S16D	FD	03/28/2016	Ground Water	260	270
CS-19 (ARNG)	MW-52S	MW-52S_S16	N	03/25/2016	Ground Water	150	160
Western Boundary	4036000-04G	4036000-04G_16Q1	N	03/24/2016	Ground Water	55	65
Western Boundary	4036000-04G	4036000-04G_16Q1D	FD	03/24/2016	Ground Water	55	65
Western Boundary	4036000-03G	4036000-03G_16Q1	N	03/24/2016	Ground Water	50	60
Western Boundary	4036000-06G	4036000-06G_16Q1	N	03/24/2016	Ground Water	108	128
Western Boundary	4036000-01G	4036000-01G_16Q1	N	03/24/2016	Ground Water	38	70
Central Impact Area	MW-95M2	MW-95M2_S16	N	03/18/2016	Ground Water	167	177
Central Impact Area	MW-95M1	MW-95M1_S16	N	03/18/2016	Ground Water	202	212
Central Impact Area	MW-89M3	MW-89M3_S16	N	03/18/2016	Ground Water	174	184
Central Impact Area	MW-89M2	MW-89M2_S16	N	03/18/2016	Ground Water	214	224
Central Impact Area	MW-89M2	MW-89M2_S16D	FD	03/18/2016	Ground Water	214	224
Central Impact Area	MW-89M1	MW-89M1_S16	N	03/18/2016	Ground Water	234	244
Central Impact Area	MW-624M2	MW-624M2_S16	N	03/17/2016	Ground Water	254	264
Central Impact Area	MW-624M1	MW-624M1_S16	N	03/17/2016	Ground Water	284	294
Central Impact Area	MW-623M3	MW-623M3_S16	N	03/17/2016	Ground Water	275	285
Central Impact Area	MW-623M3	MW-623M3_S16D	FD	03/17/2016	Ground Water	275	285
Central Impact Area	MW-623M2	MW-623M2_S16	N	03/17/2016	Ground Water	291.8	301.8
Central Impact Area	MW-51M2	MW-51M2_S16	N	03/16/2016	Ground Water	203	213
Central Impact Area	MW-178M1	MW-178M1_S16	N	03/16/2016	Ground Water	257	267
Central Impact Area	MW-202M1	MW-202M1_S16	N	03/16/2016	Ground Water	264	274

N = Normal Sample  
FD = Field Duplicate

**TABLE 1**  
**Sampling Progress: 29 February - 31 March 2016**

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-23M1	MW-23M1_S16	N	03/16/2016	Ground Water	225	235
Central Impact Area	MW-614M2	MW-614M2_S16	N	03/16/2016	Ground Water	215	225
Central Impact Area	MW-614M1	MW-614M1_S16	N	03/16/2016	Ground Water	275	285
Central Impact Area	MW-42M3	MW-42M3_S16	N	03/15/2016	Ground Water	165.8	176
Central Impact Area	MW-42M2	MW-42M2_S16	N	03/15/2016	Ground Water	185.8	196
Central Impact Area	MW-618M2	MW-618M2_S16	N	03/15/2016	Ground Water	190.5	200.5
Central Impact Area	MW-618M1	MW-618M1_S16	N	03/15/2016	Ground Water	238.5	248.5
Central Impact Area	MW-609M2	MW-609M2_S16	N	03/15/2016	Ground Water	182.4	192.4
Central Impact Area	MW-609M1	MW-609M1_S16	N	03/15/2016	Ground Water	210.4	220.4
Central Impact Area	MW-124M1	MW-124M1_S16	N	03/14/2016	Ground Water	234	244
Central Impact Area	MW-608M4	MW-608M4_S16	N	03/14/2016	Ground Water	185.4	195.4
Central Impact Area	MW-608M3	MW-608M3_S16	N	03/14/2016	Ground Water	220.4	230.4
Former N Range	SSFNRNG02	FNRBRM02_C	FR	03/14/2016	Soil	0	0.25
Central Impact Area	MW-608M2	MW-608M2_S16	N	03/14/2016	Ground Water	253.4	263.4
Former N Range	SSFNRNG02	FNRBRM02_B	FR	03/14/2016	Soil	0	0.25
Former N Range	SSFNRNG02	FNRBRM02_A	N	03/14/2016	Soil	0	0.25
Central Impact Area	MW-608M1	MW-608M1_S16	N	03/14/2016	Ground Water	267.4	277.4
Former N Range	SSFNRNG01	FNRBRM01_A	N	03/14/2016	Soil	0	0.25
Central Impact Area	MW-607M3	MW-607M3_S16	N	03/14/2016	Ground Water	157.4	167.4
Central Impact Area	MW-607M2	MW-607M2_S16	N	03/14/2016	Ground Water	177.4	187.4
Central Impact Area	MW-25	MW-25_S16	N	03/11/2016	Ground Water	108	118
Central Impact Area	MW-37M2	MW-37M2_S16	N	03/11/2016	Ground Water	145	155
Central Impact Area	MW-607M1	MW-607M1_S16	N	03/11/2016	Ground Water	207.4	217.4
Central Impact Area	MW-149M1	MW-149M1_S16	N	03/11/2016	Ground Water	237.5	247.5
Central Impact Area	MW-27	MW-27_S16	N	03/10/2016	Ground Water	117	127
J1 Range Southern	J1S-EFF	J1S-EFF-100A	N	03/10/2016	Process Water	0	0
J1 Range Southern	J1S-MID-2	J1S-MID-2-100A	N	03/10/2016	Process Water	0	0
J1 Range Southern	J1S-INF-2	J1S-INF-2-100A	N	03/10/2016	Process Water	0	0
Central Impact Area	MW-477M2	MW-477M2_S16	N	03/10/2016	Ground Water	145.6	155.6
Central Impact Area	MW-477M2	MW-477M2_S16D	FD	03/10/2016	Ground Water	145.6	155.6
Demolition Area 1	D1-EFF	D1-EFF-68A	N	03/10/2016	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-68A	N	03/10/2016	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-68A	N	03/10/2016	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-68A	N	03/10/2016	Process Water	0	0
Central Impact Area	MW-477M1	MW-477M1_S16	N	03/10/2016	Ground Water	187.5	197.5
Demolition Area 1	PR-EFF	PR-EFF-120A	N	03/10/2016	Process Water	0	0
Demolition Area 1	PR-MID-2	PR-MID-2-120A	N	03/10/2016	Process Water	0	0
Demolition Area 1	PR-MID-1	PR-MID-1-120A	N	03/10/2016	Process Water	0	0
Demolition Area 1	PR-INF	PR-INF-120A	N	03/10/2016	Process Water	0	0
Central Impact Area	MW-486M1	MW-486M1_S16	N	03/10/2016	Ground Water	185.7	195.7
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-120A	N	03/10/2016	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-120A	N	03/10/2016	Process Water	0	0
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-120A	N	03/10/2016	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-120A	N	03/10/2016	Process Water	0	0
Central Impact Area	MW-485M1	MW-485M1_S16	N	03/09/2016	Ground Water	125.3	135.3
Central Impact Area	MW-485M1	MW-485M1_S16D	FD	03/09/2016	Ground Water	125.3	135.3
J3 Range	J3-EFF	J3-EFF-114A	N	03/09/2016	Process Water	0	0
Central Impact Area	MW-40S	MW-40S_S16	N	03/09/2016	Ground Water	115.5	126
J3 Range	J3-MID-2	J3-MID-2-114A	N	03/09/2016	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-114A	N	03/09/2016	Process Water	0	0
J3 Range	J3-INF	J3-INF-114A	N	03/09/2016	Process Water	0	0
Central Impact Area	CIA2-EFF	CIA2-EFF-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-26A	N	03/09/2016	Process Water	0	0

N = Normal Sample  
FD = Field Duplicate

**TABLE 1**  
**Sampling Progress: 29 February - 31 March 2016**

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	CIA2-INF	CIA2-INF-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	MW-107M2	MW-107M2_S16	N	03/09/2016	Ground Water	125	135
Central Impact Area	CIA1-EFF	CIA1-EFF-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-26A	N	03/09/2016	Process Water	0	0
Central Impact Area	MW-01S	MW-01S_S16	N	03/09/2016	Ground Water	114	124
Central Impact Area	MW-01M2	MW-01M2_S16	N	03/09/2016	Ground Water	160	165
Central Impact Area	MW-90S	MW-90S_S16	N	03/08/2016	Ground Water	118	128
Central Impact Area	MW-235M1	MW-235M1_S16	N	03/08/2016	Ground Water	154	164
Central Impact Area	MW-44M1	MW-44M1_S16	N	03/08/2016	Ground Water	182	192
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-90A	N	03/08/2016	Process Water	0	0
Central Impact Area	MW-487M2	MW-487M2_S16	N	03/08/2016	Ground Water	195	205
J1 Range Northern	MW-487M2	MW-487M2_S16	N	03/08/2016	Ground Water	195	205
J2 Range Eastern	J2E-MID-1K	J2E-MID-1K-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-INF-J	J2E-INF-J-90A	N	03/08/2016	Process Water	0	0
Central Impact Area	OW-2	OW-2_S16	N	03/08/2016	Ground Water	175	185
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-90A	N	03/08/2016	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-90A	N	03/08/2016	Process Water	0	0
Central Impact Area	MW-91S	MW-91S_S16	N	03/07/2016	Ground Water	124	134
Central Impact Area	MW-91S	MW-91S_S16D	FD	03/07/2016	Ground Water	124	134
Central Impact Area	MW-91M1	MW-91M1_S16	N	03/07/2016	Ground Water	170	180
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-114A	N	03/07/2016	Process Water	0	0
Central Impact Area	MW-93M1	MW-93M1_S16	N	03/07/2016	Ground Water	185	195
J2 Range Northern	J2N-INF-G	J2N-INF-G-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-114A	N	03/07/2016	Process Water	0	0
Central Impact Area	MW-105M1	MW-105M1_S16	N	03/07/2016	Ground Water	205	215
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-114A	N	03/07/2016	Process Water	0	0
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-114A	N	03/07/2016	Process Water	0	0
J1 Range Northern	J1N-EFF	J1N-EFF-29A	N	03/07/2016	Process Water	0	0
J1 Range Northern	J1N-MID2	J1N-MID2-29A	N	03/07/2016	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-29A	N	03/07/2016	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-29A	N	03/07/2016	Process Water	0	0
Central Impact Area	MW-101M1	MW-101M1_S16	N	03/07/2016	Ground Water	158	168
Central Impact Area	MW-106M1	MW-106M1_S16	N	03/03/2016	Ground Water	170.5	180.5
Central Impact Area	MW-02M2	MW-02M2_S16	N	03/03/2016	Ground Water	170	175
Central Impact Area	MW-112M2	MW-112M2_S16	N	03/03/2016	Ground Water	165	175
Central Impact Area	MW-113M2	MW-113M2_S16	N	03/03/2016	Ground Water	190	200
Central Impact Area	MW-179M1	MW-179M1_S16	N	03/03/2016	Ground Water	187	197
Central Impact Area	MW-100M1	MW-100M1_S16	N	03/02/2016	Ground Water	179	189

N = Normal Sample  
FD = Field Duplicate

**TABLE 1**  
**Sampling Progress: 29 February - 31 March 2016**

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-100M1	MW-100M1_S16D	FD	03/02/2016	Ground Water	179	189
Central Impact Area	MW-99S	MW-99S_S16	N	03/02/2016	Ground Water	133	143
Former B Range	FBR17	MISFBR17_C	FR	03/02/2016	Soil	0	0.25
Former B Range	FBR17	MISFBR17_B	FR	03/02/2016	Soil	0	0.25
Central Impact Area	MW-98M1	MW-98M1_S16	N	03/02/2016	Ground Water	164	174
Former B Range	FBR17	MISFBR17_A	N	03/02/2016	Soil	0	0.25
D Range	DR03	DR03_C	FR	03/02/2016	Soil	0	0.25
D Range	DR03	DR03_B	FR	03/02/2016	Soil	0	0.25
Central Impact Area	MW-623M1	MW-623M1_S16	N	03/02/2016	Ground Water	340	350
D Range	DR03	DR03_A	N	03/02/2016	Soil	0	0.25
D Range	DR05	DR05_A	N	03/02/2016	Soil	0	0.25
D Range	DR04	DR04_A	FR	03/02/2016	Soil	0	0.25
Central Impact Area	MW-644M2	MW-644M2_S16	N	03/01/2016	Ground Water	230.9	240.9
Central Impact Area	MW-644M1	MW-644M1_S16	N	03/01/2016	Ground Water	275.9	285.9
Central Impact Area	MW-223M2	MW-223M2_S16	N	03/01/2016	Ground Water	185	195
Central Impact Area	MW-223M1	MW-223M1_S16	N	03/01/2016	Ground Water	211	221
Central Impact Area	MW-223D	MW-223D_S16	N	03/01/2016	Ground Water	260	270
Central Impact Area	MW-207M1	MW-207M1_S16	N	02/29/2016	Ground Water	254	264
Central Impact Area	MW-176M1	MW-176M1_S16	N	02/29/2016	Ground Water	270	280
Central Impact Area	MW-629M2	MW-629M2_S16	N	02/29/2016	Ground Water	186.9	196.9
Central Impact Area	MW-629M1	MW-629M1_S16	N	02/29/2016	Ground Water	216.9	226.9
Central Impact Area	MW-629M1	MW-629M1_S16D	FD	02/29/2016	Ground Water	216.9	226.9
Central Impact Area	MW-638M2	MW-638M2_S16	N	02/29/2016	Ground Water	204.2	214.2
Central Impact Area	MW-638M1	MW-638M1_S16	N	02/29/2016	Ground Water	261.2	271.2

**TABLE 2**  
**VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS**  
**Data Received March 2016**

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
Demolition Area 1	MW-231M1	MW-231M1_S16	210.5	220.5	01/28/2016	SW6850	Perchlorate	15.2		UG/L	2.0	X	0.015	0.20
Demolition Area 1	MW-240M1	MW-240M1_S16	198	208	01/28/2016	SW6850	Perchlorate	0.019	J	UG/L	2.0		0.015	0.20
J2 Range Northern	MW-619M1	MW-619M1_S16	255.1	265.1	01/27/2016	SW6850	Perchlorate	0.50		UG/L	2.0		0.015	0.20
J2 Range Northern	J2EW0001	J2EW0001_S16	179	234	01/27/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.23		UG/L	0.60		0.025	0.20
J2 Range Northern	J2EW0001	J2EW0001_S16	179	234	01/27/2016	SW6850	Perchlorate	3.6		UG/L	2.0	X	0.015	0.20
J2 Range Northern	J2EW0001	J2EW0001_S16D	179	234	01/27/2016	SW6850	Perchlorate	3.5		UG/L	2.0	X	0.015	0.20
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_S16	240.8	250.8	01/27/2016	SW6850	Perchlorate	2.3		UG/L	2.0	X	0.015	0.20
J2 Range Northern	J2EW0002	J2EW0002_S16	198	233	01/26/2016	SW6850	Perchlorate	3.5		UG/L	2.0	X	0.015	0.20
J2 Range Northern	J2EW0003	J2EW0003_S16	202	232	01/26/2016	SW6850	Perchlorate	0.65		UG/L	2.0		0.015	0.20
J2 Range Northern	MW-612M1	MW-612M1_S16	297	307	01/26/2016	SW6850	Perchlorate	0.027	J	UG/L	2.0		0.015	0.20
J2 Range Northern	MW-327M3	MW-327M3_S16	220.2	230.2	01/19/2016	SW6850	Perchlorate	0.032	J	UG/L	2.0		0.015	0.20
J2 Range Northern	MW-313M3	MW-313M3_S16	195.1	205.6	01/19/2016	SW6850	Perchlorate	0.016	J	UG/L	2.0		0.015	0.20
J2 Range Northern	MW-313M2	MW-313M2_S16	215.5	225.5	01/19/2016	SW6850	Perchlorate	0.97		UG/L	2.0		0.015	0.20
J2 Range Northern	MW-313M1	MW-313M1_S16	255.4	265.4	01/19/2016	SW6850	Perchlorate	8.9		UG/L	2.0	X	0.015	0.20
J2 Range Northern	MW-313M1	MW-313M1_S16D	255.4	265.4	01/19/2016	SW6850	Perchlorate	9.1		UG/L	2.0	X	0.015	0.20
L Range	MW-242M1	MW-242M1_S16	235	245	01/11/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.7		UG/L	0.60	X	0.025	0.20
L Range	MW-242M1	MW-242M1_S16D	235	245	01/11/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.7		UG/L	0.60	X	0.025	0.20
L Range	90MW0034	90MW0034_S16	94	99	01/06/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.86		UG/L	0.60	X	0.025	0.20
L Range	90MW0031	90MW0031_S16	195.3	200.2	01/06/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.69		UG/L	0.60	X	0.025	0.20
L Range	MW-595M1	MW-595M1_S16	255.3	265.3	01/06/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.1		UG/L	0.60	X	0.025	0.20
J3 Range	MW-637M2	MW-637M2_S16	214.1	224.1	01/05/2016	SW6850	Perchlorate	3.1		UG/L	2.0	X	0.015	0.20
J3 Range	90EW0001	90EW0001_S16	83.1	143.8	01/04/2016	SW6850	Perchlorate	0.40		UG/L	2.0		0.015	0.20
J3 Range	90EW0001	90EW0001_S16	83.1	143.8	01/04/2016	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.52		UG/L	400		0.019	0.20
J3 Range	J3EW0032	J3EW0032_S16	102	152	01/04/2016	SW6850	Perchlorate	0.59		UG/L	2.0		0.015	0.20
J3 Range	J3EW0032	J3EW0032_S16	102	152	01/04/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.3		UG/L	0.60	X	0.025	0.20
J3 Range	J3EW0032	J3EW0032_S16D	102	152	01/04/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.3		UG/L	0.60	X	0.025	0.20
J3 Range	J3EWIP1	J3EWIP1_S16	153	193	01/04/2016	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.21		UG/L	400		0.019	0.20
J3 Range	J3EWIP1	J3EWIP1_S16	153	193	01/04/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.26		UG/L	0.60		0.025	0.20
J3 Range	J3EWIP1	J3EWIP1_S16	153	193	01/04/2016	SW6850	Perchlorate	5.3		UG/L	2.0	X	0.015	0.20
J3 Range	J3EWIP1	J3EWIP1_S16D	153	193	01/04/2016	SW6850	Perchlorate	6.1		UG/L	2.0	X	0.015	0.20
J3 Range	MW-636M2	MW-636M2_S16	110.5	120.5	01/04/2016	SW6850	Perchlorate	1.3		UG/L	2.0		0.015	0.20
Central Impact Area	MW-626M2	MW-626M2_R3	237.2	247.2	01/04/2016	SW6850	Perchlorate	0.12	J	UG/L	2.0		0.015	0.20
Central Impact Area	MW-626M2	MW-626M2_R3	237.2	247.2	01/04/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.2		UG/L	0.60	X	0.025	0.20
Central Impact Area	MW-626M1	MW-626M1_R3	282.2	292.2	01/04/2016	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.9		UG/L	0.60	X	0.025	0.20

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