MONTHLY PROGRESS REPORT #246
FOR SEPTEMBER 2017

EPA REGION I ADMINISTRATIVE ORDERS SDWA 1-97-1019 and 1-2000-0014

JOINT BASE CAPE COD (JBCC)
TRAINING RANGE AND IMPACT AREA

The following summary of progress is for the period from 1 September to 30 September 2017.

1. SUMMARY OF REMEDIATION ACTIONS

The following is a description of Remediation Actions (RA) underway at Camp Edwards as of September 2017.

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 2.501 billion gallons of water treated and re-injected as of 29 September 2017. The following Frank Perkins Road facility shut downs occurred in September:

- Turned off due to Tropical Storm Jose at 1330 on 19 September 2017 and was restarted at 1410 on 28 September 2017. Communications with the treatment system facility did not restart after the storm had passed; plant was operational as of 28 September 2017, full communications with the treatment system will require more time to troubleshoot.

The Pew Road Mobile Treatment Unit (MTU) continues to operate at a flow rate of 103 gpm with over 540.2 million gallons of water treated and re-injected as of 29 September 2017. The following Pew Road MTU shut downs occurred in September:

- Turned off due to Tropical Storm Jose at 0742 on 19 September 2017 and was restarted at 0845 on 25 September 2017.

The Base Boundary RA is operating at a flow rate of 65 gpm with over 176.2 million gallons of water treated and re-injected as of 29 September 2017. The following Base Boundary MTU shut downs occurred in September:

- Turned off due to Tropical Storm Jose at 1120 on 19 September 2017 and was restarted at 1215 on 25 September.

The Leading Edge system continues to operate at a flow rate of 100 gpm with over 71.4 million gallons of water treated and re-injected as of 29 September 2017. The following Leading Edge system shut downs occurred in September:

- Shut down at 1139 on 6 September 2017 due to thunderstorms and was restarted at 1201 on 6 September 2017;
- Shut down at 1107 on 10 September 2017 due to a power interruption and was restarted at 0740 on 11 September 2017; and
- Turned off due to Tropical Storm Jose at 1030 on 19 September 2017 and was restarted at 1148 on 25 September 2017.

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 29 September 2017, over 437.9 million gallons of water have been treated and re-injected. The following J-1 Range Southern system shut downs occurred in September:

- Turned off due to Tropical Storm Jose at 1407 on 19 September 2017 and was restarted at 1125 on 25 September 2017.

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 29 September 2017, over 491.7 million gallons of water have been treated and re-injected. The following J-1 Range Northern MTU shut downs occurred in September:

- Turned off due to Tropical Storm Jose at 0850 on 19 September 2017 and was restarted at 0930 on 25 September 2017.

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 225 gpm while 90EW0001 is offline awaiting repair. As of 29 September 2017, over 1.052 billion gallons of water have been treated and re-injected. The following J-3 Range system shut downs occurred in September:

- 90EW0001 shut down at 0803 on 14 September 2017 due to a system alarm, "Lost Communications with Well"; there was no power to the VFD panel at the well vault. BETCO was contacted and was on-site on 15 September 2017. It was determined that the VFD drive must be replaced and the well will remain offline while a replacement VFD is being obtained, at which point it will be installed and programmed; and
- J3EW0032 and J3EWIP2 were turned off due to Tropical Storm Jose at 1300 on 19 September 2017 and these two extraction wells were restarted at 0938 on 25 September 2017. Upon restart, J3EWIP1 (100 gpm) was not communicating with the plant. This extraction well will be accessed on 03 October 2017.

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 29 September 2017, over 927.9 million gallons of water have been treated and re-injected. The following Northern Treatment Building shut downs occurred in September:

- Shut down at 1130 on 6 September 2017 due to a system alarm (caused by thunderstorms) and was restarted at 1300 on 6 September 2017; and
- Turned off due to Tropical Storm Jose 0820 on 19 September 2017 and was restarted at 0800 on 25 September 2017.

The Northern MTUs E and F continue to operate at a flow rate of 250 gpm. As of 29 September 2017, over 1.376 billion gallons of water have been treated and re-injected. The following J-2 Range Northern MTU shut down occurred in September:

- MTUs E and F shut down at 1126 on 6 September 2017 due to a system alarm (caused by thunderstorms) and was restarted at 1248 on 6 September 2017; and
- Turned off due to Tropical Storm Jose at 0820 on 19 September 2017 and was restarted at 0800 on 25 September 2017.

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 29 September 2017, over 996.1 million gallons of water have been treated and re-injected. The following MTU H and I shut downs occurred in September:

- Turned off due to Tropical Storm Jose at 1245 on 19 September 2017 and was restarted at 1025 on 25 September 2017

MTU J continues to operate at a flow rate of 120 gpm. As of 29 September 2017, over 460.5 million gallons of water have been treated and re-injected. The following shut downs of MTU J occurred in September:

- Turned off due to Tropical Storm Jose at 1047 on 19 September 2017 and was restarted at 1235 on 25 September 2017.

MTU K continues to operate at a flow rate of 125 gpm. As of 29 September 2017, over 571.9 million gallons of water have been treated and re-injected. The following shut downs of MTU K occurred in September:

- Turned off due to Tropical Storm Jose at 1056 on 19 September 2017 and was restarted at 1140 on 25 September 2017.

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 29 September 2017, over 1.098 billion gallons of water have been treated and re-injected. The following CIA treatment facility shut downs occurred in September:

- System 3 shut down at 1129 on 6 September 2017 due to a system alarm (caused by thunderstorms) and was restarted on 7 September 2017;
- System 3 shut down at 2316 on 10 September 2017 due to a power interruption and was restarted at 0730 on 12 September 2017;
- System 3 shut down at 1830 on 13 September 2017 due to a power interruption and was restarted at 0729 on 12 September 2017;
- System 3 shut down at 1808 on 15 September 2017, due to a power supply interruption (Low Flow alarm) and remained off for Tropical Storm Jose. The system was restarted at 0744 on 26 September 2017;

- Systems 1 and 2 were turned off due to Tropical Storm Jose at 1155 (CIA1) and 1210 (CIA2) on 19 September 2017 and were restarted at 1040 (CIA1) and 1055 (CIA2) on 25 September 2017; and
- System 3 shut down at 2031 on 26 September 2017, due to a power supply interruption (Low Flow alarm) and was restarted at 0728 on 28 September 2017.

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, Leading Edge, 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 J-2 Range Northern and J-2 Range Eastern.

Completed BEM backfilling and demo operations at CIA.

Performed daily inspection of BEM cover at the CIA to ensure cover is secure and intact.

JBCC IAGWSP Tech Update Meeting Minutes 24 August 2017

Project and Fieldwork Update

IAGWSP presented a figure showing drive point data for J-1 South. IAGWSP will issue a project note with recommendations for additional drive point and for permanent well locations (to be installed in the fall). EPA asked if turning the base boundary well back on should be considered based on drive point well results. DEP pointed out that this area would be outside of the capture zone. The group discussed whether the excavations would have mobilized the RDX but it was noted that the post-excavation samples at the suspected source area were ND. EPA commented that the water table needs to be mapped out in more detail. IAGWSP proposed a sampling round for perchlorate since this plume might be from a separate source area. USACE stated that the drilling was more difficult than expected and that there had been several refusals. USACE will review what drive points are still available for sampling.

USACE said that the previously-designated Western Boundary wells (three locations with nine screens) have been turned over to the Bourne Water District. USACE reported that the CIA2 injection well will be online by September. Sampling crews are currently at J-2 North. All systems are running and crews will be sampling the BEM well.

In the Central Impact Area, crews are wrapping up the digs in the northern most area and will finish by the end of the month. They will move on to BEM reconstruction and do 100% grids in 10 acres. USAEC will confirm all necessary work has been completed at the required number of acres. DEP stated their comments on the Source Report will be provided by 9/14/17.

USACE noted that the Phase III contract will be awarded by the end of month. USACE-Baltimore is investigation anomalies with the mini-excavator in the area with co-located munitions debris/practice round at J-2.

In the Small Arms Ranges, no new fieldwork has been conducted. USACE is working on a contract modification for completing the remaining work at three ranges.

USACE explained that no UXO personnel are available from 9/1-9/12 so there can be no site visits that would require escorts during that period.

Action Items

The action items were discussed and updated.

AECOM RDX/Perchlorate Attenuation and Treatment Technology Update

AECOM was tasked with: 1) Evaluating the attenuation factors being used at JBCC and recommending studies that could be conducted to establish technically justifiable attenuation factors and 2) Evaluating the current pump and treatment systems for RDX/perchlorate and identifying alternative technologies. They were expected to recommend bench or pilot studies of alternative technologies.

AECOM explained that they evaluated contaminant and geochemical conditions for the RDX/perchlorate plumes at JBCC. Site conditions and attenuation factors were compared to other RDX/perchlorate sites. Attenuation factors currently used at JBCC are very low and groundwater conditions, such as low total organic carbon content, relatively permeable soil (sand), high oxidation reduction potential and high dissolved oxygen, are not favorable for a high degree of retardation or anaerobic/abiotic degradation. However, degradation may still be occurring and newer methods are now available to evaluate in-situ degradation in a more comprehensive manner.

AECOM recommends looking at the newer methods for monitoring and the microbial community could provide a better way to understand the rate of natural degradation at JBCC. AECOM suggested the Microbial Insights Biotrap technology at J1 South, CIA, Demo 1 and NWC. Biotraps would be placed in monitoring wells for 30-45 days. The biotraps are beads that allow colonization. The beads are then recovered for analysis. The biotrap technology, along with collection of specific geochemical parameters, would provide evidence of the presence or absence of microbes known to degrade RDX and/or perchlorate. The testing would also provide insights in what conditions are inhibiting a higher rate of natural attenuation. The testing could provide data on the viability of in-situ treatment methods (enhanced biodegradation, and an in-situ product called “Plume Stop”).

DEP asked if there was any review of the breakdown products and AECOM replied that there was very little evidence and this is not surprising because the molecules fly apart. The biotrap method is much more sensitive because it provides a place for microbes to latch onto. This inert method allows 40 days to assess the microbes to see what is able to grow.

USACE noted that the cleanup times in the decision documents are created by the models and assume attenuation factors of five years, which begin with the sampling rounds.

EPA is concerned that the cleanup is not happening as quickly as expected and small plumelets are becoming more prevalent. IAGWSP stated that is the reason why in-situ treatment might be a good approach. EPA stated that they had reservations about “Plume Stop” or anything like it and would need to know more about the compounds going into the aquifer to make sure they are not causing any more harm or altering the water chemistry with unintended consequences. AECOM noted that “Plume Stop” has a range of products, one of which is just carbon. They explained that any additives are supposed to help keep the products in suspension longer, which might not be needed on Cape Cod.

AECOM presented their evaluations of the effectiveness and cost of the current treatment systems. They explained that some alternative technologies may offer more flexibility and lower costs. Based on a preliminary screening of a wide variety of potential alternative treatment methods, two promising technologies (UV and Mulch Infiltration Gallery) were selected for detailed evaluation. UV offers advantages over activated carbon in situations where RDX only is present (J1 South and portions of CIA for example). The primary advantages for UV are lower overall operating costs and ease of relocation. UV has proven to be effective at other similar RDX sites.

AECOM noted that a Mulch Infiltration Gallery may be cost-effective for treatment of both RDX and perchlorate. Use of solar power is feasible for remote locations (CIA, for example). The Mulch Infiltration Gallery has not been used for similar sites and would require bench and pilot scale testing.

The UV treatment would offer the same technology as disinfection units used for potable water and this has been successful operation at other military sites. AECOM stated that conditions at JBCC are favorable for UV (high clarity of water, low iron content) and there is cost savings (in the range of 30% over ten year period) compared to activated carbon. A UV system would be fairly easy to move from well to well however, it does not treat perchlorate.

A UV pilot study at J-1 South is proposed. Water would be run thorough the UV system over a three month period. Water would be tested for RDX and breakdown products. During pilot test water treated by UV would be run thorough activated carbon to assure no discharge of impacted water. Purchase of a 35 gpm unit for the pilot is suggested and this could also be used in a full- scale operation. Pictures of UV units at a Nebraska DoD site were shown as well as a graphic for the pilot test.

AECOM explained the Mulch Bed Infiltration Gallery option and noted that RDX and perchlorate are easily degraded under the right conditions. The beds would require minimal maintenance and the only energy needs are to pump water to the surface. They noted that this is more cost effective compared to activated carbon and/or ion exchange. Local materials (such as brewer’s yeast and sea shells could be used thus giving this a “green” technology label. AECOM estimates this option may accelerate in-situ treatment by delivering TOC to groundwater (effect probably minimal). The noted this is not a proven technology and would require bench and pilot testing, as well as process development. They suggested burying the bed to allow operation in the winter but monitoring effectiveness would be challenging. Test would need to be performed to assure that RDX/perchlorate is treated not just absorbed.

AECOM recommended a pilot test of UV treatment at J-1South. Water would be treated by UV then processed thorough activated carbon until the UV process is proven. Pilot scale equipment would be suitable for use as full-scale equipment, if testing is successful.

AECOM also suggested simple bucket testing on-site is proposed as the first step in assessing the viability of a Mulch Infiltration Gallery. In these tests site groundwater from impacted monitoring wells would be poured into buckets containing various mulch mixes. After time to react, the water would be tested to determine if treatment were successful. If the preliminary bucket testing of mulches is successful, column

studies of viable mulch mixes would then be conducted. Based on results of the soil column studies, a pilot study could be designed.

AECOM also conducted a preliminary evaluation of the Plume Stop technology. Plume Stop is the injection of small particle size activated carbon into the aquifer. The activated carbon would hopefully slow the migration of RDX and provide more time and improved conditions for natural biodegradation. Plume Stop could be deployed to act as a reactive barrier to replace or supplement the pump and treat containment systems. Assessing the viability of Plume Stop would require several preliminary steps (derive isotherms for RDX, determine natural degradation rates, identify competing species, flux zone characterization and modeling). The microcosm studies proposed as part of the attenuation study would provide useful preliminary data for evaluating the viability of Plume Stop.

PlumeStop is also known as Liquid Activated Carbon and is injectable at low pressure. It flows like ink and coats flux channels. It does not impede groundwater flow and is commonly used for rapid compliance achievement.

JBCC IAGWSP Tech Update Meeting Minutes 28 September 2017

Project and Fieldwork Update

The drill rig that is going to be installing the reinjection well will be on site on Sunday. There may be a prescribed burn in the area of the reinjection well next week but the team is coordinating with natural resources staff and work will not be impacted. In advance of last week's hurricane, the treatment systems were shut down on Wednesday, September 20th and restarted on Monday, September 25th. The Demolition Area 1 Frank Perkins Road system did not turn back on due to a programming issue. The programmers will be on site today to restart the system. The J-3 system extraction well EW0001 is down because it needs a new VFD, however the model of the VFD is obsolete and has been discontinued. A compatible one has been ordered and is scheduled to be here in the middle of October. In addition, the in-plume well lost communication with the system. The programmer will re-program that well today after visiting Demo 1. Sampling crews are in the J-2 Range trying to complete sampling so that the report can be finished by the end of the year.

In the Small Arms Ranges, no new fieldwork has been conducted. USACE is working on a contract modification for completing the remaining work at three ranges. Funds are on contract and it is anticipated work will begin around the third week of October. Four lifts are required at D Range, C Range and Former B Range. MassDEP reminded the group that the area cut between D and C Ranges needs to be restored as it is filling with water and turning into a wetland. IAGWSP noted that they would coordinate with Mike Ciaranca and Jake McCumber on restoration efforts.

In the Central Impact Area, crews completed BEM shots yesterday and are working on cleaning up and covering the BEM for the season. They are proceeding to sort and move up to 78 tons of scrap off base. Mass Guard may take some for their recycling program and USACE will coordinate with them. After the team completes the scrap work, they will perform some cutting for firebreaks and de-mob by November. When they re-mob next year, they will have 4,000 digs on their contract but they can't do anything until the Huntsville contractor has digs available for them. That contract will be awarded no later than September 30th.

Action Items

The action items were discussed and updated.

Advanced Classification Results Presentation

A presentation was provided on the results of the CIA Phase 2 Area 3 100% dig validation. A figure showing the grid (40-56) selected by EPA 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 40-30. There were 460 EM61 anomaly locations with Metal Mapper cued data collection. Of those, 191 met the dig criteria and 5 of these had multiple dig location resulting in a total of 196 likely TOI digs and a recommended dig rate of 45%. The remaining 239 anomalies were dug for QA for a total of 435 digs. Twenty-two TOI (UXO or UXO-like items) were recovered. For the classification results, one TOI was missed and 238 clutter items were correctly classified. 42% 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: 19% clutter digs were very large pieces of range- related debris such as tank parts & large sheet metal, the average number of items in single clutter ‘dig’ was 8 and the average weight of munitions debris from clutter ‘dig’ was 9 pounds. It was noted that the number of items and weight of correctly classified clutter was generally much smaller and that the higher than anticipated clutter dig rate was unavoidable due to the conditions of this grid.

A photo of the misclassified TOI was displayed and discussed. The item was deep, near the expected limited of classification and the data response curves did not have the characteristics expected of an 81mm, resulting a poor library match.

The combined results of all 100% dig tests (ESTCP and nine ¼ acre grids) was reviewed and discussed. Only three UXO items were missed (1 partial 81mm and 2 very deep 81mms). These results far exceed the Decision Document requirements and the classification goal of 95% TOI and slightly under 70% reduction in clutter digs.

The current status of the project was reviewed. Phase I is complete, Phase 2 Area 1 is complete with ~35% dig rate, Phase 2 Area 2 is complete with ~45% dig rate, Phase 2 Area 3 is complete with ~42% dig rate and 14,009 total cued, and >34k digs saved in Phase 2. The HNC Design Center currently contracting next 10 acres (Phase 3 Area 1) and classification will be performed by DAGCAP accredited contractor. Ms. Walker noted that the award was made to Parsons and noted that they were the first commercial contractor to receive DAGCAP certification. She explained that DAGCAP was the Department of Defense Advanced Geophysical Classification Accreditation Program, a unified program for organizations to demonstrate competency and document conformance to minimum quality systems requirements; modeled after laboratory accreditation program. Accreditation achieved by: (1) assessment of the organization’s quality system; and (2) successful demonstration of capabilities at APG test site. An OSD memo from April 2016 requires DoD to begin using accredited organizations on munitions response projects in calendar year 2017. To date there are 6 accredited firms.

A status map showing work conducted to date was displayed.

Demolition Area 2 Annual Environmental Monitoring Report – Presentation

A presentation was provided on the Demolition Area 2 Environmental Monitoring Report. During the reporting period (July 2016 to June 2017), no new field work was conducted. Sampling locations, groundwater monitoring results, and trends were reviewed and discussed. RDX was detected in our of twenty-one monitoring wells sampled and concentrations ranged from
0.21 µg/L (MW-160S to 0.76 µg/L (MW-573ME). Only one location (MW-573M2) exceeded the
0.6 µg/L risk-based level. No samples exceeded the 2 µg/L EPA and no other explosive compounds were detected during this reporting period.

Figures showing RDX trend plots and the model predicted plumes vs. observed concentrations were displayed. Decision Document cleanup timelines were discussed. The estimates presented in the 2015 Decision Document addendum of below Health Advisory (2 µg/L) by 2016, below Risk- Based Level (0.6 µg/L) by 2018 and below Background Level (0.25 µg/L) by 2025 are still accurate. IAGWSP is not recommending any changes to the monitoring network at this time. They propose to continue to monitor downgradient wells MW-654 and MW-655 and establish trends, if any. It was noted that the annual report was submitted to the agencies today and comments are requested by October 20.

JBCC Cleanup Team Meeting

The next meeting of the JBCC Cleanup Team (JBCCCT), formerly the MMR Cleanup Team (MMRCT) has not been scheduled. 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 September to 30 September 2017. 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. 245 for August 2017 9/10/2017
- Final Small Arms Ranges 2017 Annual Environmental Monitoring Report 9/19/2017
- Northwest Corner Groundwater Plume, Contaminants of Concern, Removal of RDX from COC List Project Note 9/19/2017
- Draft Demolition Area 2 2017 Annual Environmental Monitoring Report 9/27/2017

3. SCHEDULED ACTIONS

The following documents are being prepared or revised during October 2017:

- Training Areas Draft Investigation Report;
- Training Areas Remedy Selection Plan;
- 2016 CIA Source Removal Annual Report;
- Draft 2016 BIP and Cracked Open Items Summary Report;
- J-3 Range Confirmatory Geophysical and Soil Investigation Technical Memorandum;
- J-1 Range Northern and J-1 Range Southern 2017 Annual Environmental Monitoring Report;
- J-1 Range Southern Drive Point and Water Table Well Locations Project Note;
- Five Year Review Report;
- Demolition Area 2 2017 Annual Environmental Monitoring Report;
- Northwest Corner 2017 Annual Environmental Monitoring Report; and
- J-3 Range 2017 Annual Environmental Monitoring Report.

TABLE 1

Sampling Progress: 1 September to 30 September 2017

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	J2MW-01M2	J2MW-01M2_F17	N	09/28/2017	Ground Water	245	255
J2 Range Eastern	J2MW-01M2	J2MW-01M2_F17D	FD	09/28/2017	Ground Water	245	255
J2 Range Eastern	J2MW-01M1	J2MW-01M1_F17	N	09/28/2017	Ground Water	275	285
J2 Range Eastern	J2MW-02PZ	J2MW-02PZ_F17	N	09/28/2017	Ground Water	191	201
J2 Range Eastern	J2MW-02M2	J2MW-02M2_F17	N	09/28/2017	Ground Water	236	246
J2 Range Eastern	J2MW-02M1	J2MW-02M1_F17	N	09/28/2017	Ground Water	271	281
J2 Range Eastern	MW-137S	MW-137S_F17	N	09/27/2017	Ground Water	105.4	115.4
J2 Range Eastern	MW-120S	MW-120S_F17	N	09/27/2017	Ground Water	103	113
J2 Range Eastern	MW-121S	MW-121S_F17	N	09/27/2017	Ground Water	88	98
J2 Range Eastern	MW-154S	MW-154S_F17	N	09/27/2017	Ground Water	98	108
J2 Range Northern	J2EW2-MW2-B	J2EW2-MW2-B_F17	N	09/26/2017	Ground Water	209.8	219.8
J2 Range Northern	J2EW2-MW2-C	J2EW2-MW2-C_F17	N	09/26/2017	Ground Water	243.8	253.8
J2 Range Northern	J2EW1-MW1-B	J2EW1-MW1-B_F17	N	09/26/2017	Ground Water	205.8	215.8
J2 Range Northern	J2EW1-MW1-C	J2EW1-MW1-C_F17	N	09/26/2017	Ground Water	240.8	250.8
J2 Range Northern	J2EW3-MW-2-B	J2EW3-MW-2-B_F17	N	09/26/2017	Ground Water	216.2	226.2
J2 Range Northern	J2EW3-MW-2-C	J2EW3-MW-2-C_F17	N	09/25/2017	Ground Water	251.1	261.1
J2 Range Northern	J2EW3-MW1-B	J2EW3-MW1-B_F17	N	09/25/2017	Ground Water	210.7	220.7
J2 Range Northern	J2EW3-MW1-C	J2EW3-MW1-C_F17	N	09/25/2017	Ground Water	245.7	255.7
J2 Range Eastern	MW-667M2	MW-667M2_F17	N	09/20/2017	Ground Water	277.3	287.3
J2 Range Eastern	MW-667M2	MW-667M2_F17D	FD	09/20/2017	Ground Water	277.3	287.3
J2 Range Eastern	MW-667M1	MW-667M1_F17	N	09/20/2017	Ground Water	302.3	312.3
J2 Range Eastern	MW-667M1	MW-667M1_F17D	FD	09/20/2017	Ground Water	302.3	312.3
J2 Range Eastern	MW-215M2	MW-215M2_F17	N	09/20/2017	Ground Water	205	215
J2 Range Eastern	MW-215M2	MW-215M2_F17D	FD	09/20/2017	Ground Water	205	215
J2 Range Eastern	MW-215M1	MW-215M1_F17	N	09/20/2017	Ground Water	240	250
J2 Range Eastern	J2MW-04M2	J2MW-04M2_F17	N	09/20/2017	Ground Water	210	220
J2 Range Eastern	J2MW-04M1	J2MW-04M1_F17	N	09/20/2017	Ground Water	257	267
J2 Range Eastern	J2MW-05M2	J2MW-05M2_F17	N	09/19/2017	Ground Water	185	195
J2 Range Eastern	J2MW-05M1	J2MW-05M1_F17	N	09/19/2017	Ground Water	225	235
J2 Range Eastern	MW-319M2	MW-319M2_F17	N	09/19/2017	Ground Water	165.2	175.2
J2 Range Eastern	MW-319M1	MW-319M1_F17	N	09/19/2017	Ground Water	200.3	210.3
J2 Range Eastern	MW-354M2	MW-354M2_F17	N	09/19/2017	Ground Water	234.8	244.8
J2 Range Eastern	MW-354M1	MW-354M1_F17	N	09/19/2017	Ground Water	274.5	284.5
J2 Range Eastern	MW-310M1	MW-310M1_F17	N	09/18/2017	Ground Water	171.4	181.4
J2 Range Eastern	MW-158S	MW-158S_F17	N	09/18/2017	Ground Water	89	99
J2 Range Eastern	MW-116S	MW-116S_F17	N	09/18/2017	Ground Water	103	113.7
J2 Range Eastern	MW-307M3	MW-307M3_F17	N	09/18/2017	Ground Water	125.8	135.8
J2 Range Eastern	MW-228S	MW-228S_F17	N	09/18/2017	Ground Water	104	114
J2 Range Eastern	MW-365M2	MW-365M2_F17	N	09/14/2017	Ground Water	205.5	215.5
J2 Range Eastern	MW-399M1	MW-399M1_F17	N	09/14/2017	Ground Water	238.2	248.2
J2 Range Eastern	MW-388M2	MW-388M2_F17	N	09/14/2017	Ground Water	144.8	154.8
J2 Range Eastern	MW-388M1	MW-388M1_F17	N	09/14/2017	Ground Water	175.2	185.2
Central Impact Area	CIA3-EFF	CIA3-EFF-15A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA3-MID2	CIA3-MID2-15A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA3-MID1	CIA3-MID1-15A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA3-INF	CIA3-INF-15A	N	09/14/2017	Process Water	0	0
J2 Range Eastern	MW-436M2	MW-436M2_F17	N	09/14/2017	Ground Water	235.5	245.5
Central Impact Area	CIA2-EFF	CIA2-EFF-44A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA2-MID2	CIA2-MID2-44A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA2-MID1	CIA2-MID1-44A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA2-INF	CIA2-INF-44A	N	09/14/2017	Process Water	0	0
J2 Range Eastern	MW-436M1	MW-436M1_F17	N	09/14/2017	Ground Water	295.5	305.5
Central Impact Area	CIA1-EFF	CIA1-EFF-44A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA1-MID2	CIA1-MID2-44A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA1-MID1	CIA1-MID1-44A	N	09/14/2017	Process Water	0	0
Central Impact Area	CIA1-INF	CIA1-INF-44A	N	09/14/2017	Process Water	0	0
J2 Range Eastern	MW-685M1	MW-685M1_F17	N	09/13/2017	Ground Water	166.2	176.2
J2 Range Eastern	J2E-EFF-K	J2E-EFF-K-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-2K	J2E-MID-2K-108A	N	09/13/2017	Process Water	0	0

N = Normal Sample
FD = Field Duplicate

TABLE 1

Sampling Progress: 1 September to 30 September 2017

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-MID-1K	J2E-MID-1K-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-INF-K	J2E-INF-K-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-EFF-J	J2E-EFF-J-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-2J	J2E-MID-2J-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-1J	J2E-MID-1J-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-INF-J	J2E-INF-J-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-EFF-IH	J2E-EFF-IH-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-2H	J2E-MID-2H-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-1H	J2E-MID-1H-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-2I	J2E-MID-2I-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-MID-1I	J2E-MID-1I-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	J2E-INF-I	J2E-INF-I-108A	N	09/13/2017	Process Water	0	0
J2 Range Eastern	MW-668M1	MW-668M1_F17	N	09/12/2017	Ground Water	168.7	178.7
J2 Range Eastern	MW-668M1	MW-668M1_F17D	FD	09/12/2017	Ground Water	168.7	178.7
J2 Range Northern	J2N-EFF-G	J2N-EFF-G-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-MID-2G	J2N-MID-2G-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-MID-1G	J2N-MID-1G-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-INF-G	J2N-INF-G-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	MW-634M3	MW-634M3_F17	N	09/11/2017	Ground Water	170.6	180.6
J2 Range Northern	J2N-EFF-EF	J2N-EFF-EF-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-MID-2F	J2N-MID-2F-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-MID-1F	J2N-MID-1F-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-INF-EF	J2N-INF-EF-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	MW-634M2	MW-634M2_F17	N	09/11/2017	Ground Water	200.6	210.6
J2 Range Northern	J2N-MID-2E	J2N-MID-2E-132A	N	09/11/2017	Process Water	0	0
J2 Range Northern	J2N-MID-1E	J2N-MID-1E-132A	N	09/11/2017	Process Water	0	0
J1 Range Northern	J1N-EFF	J1N-EFF-47A	N	09/11/2017	Process Water	0	0
J2 Range Northern	MW-634M1	MW-634M1_F17	N	09/11/2017	Ground Water	305.6	315.6
J1 Range Northern	J1N-MID2	J1N-MID2-47A	N	09/11/2017	Process Water	0	0
J1 Range Northern	J1N-MID1	J1N-MID1-47A	N	09/11/2017	Process Water	0	0
J1 Range Northern	J1N-INF2	J1N-INF2-47A	N	09/11/2017	Process Water	0	0
J2 Range Northern	MW-640M2	MW-640M2_F17	N	09/07/2017	Ground Water	216	226
Demolition Area 1	D1LE-EFF	D1LE-EFF-14A	N	09/07/2017	Process Water	0	0
Demolition Area 1	D1LE-MID2	D1LE-MID2-14A	N	09/07/2017	Process Water	0	0
Demolition Area 1	D1LE-MID1	D1LE-MID1-14A	N	09/07/2017	Process Water	0	0
Demolition Area 1	D1LE-INF	D1LE-INF-14A	N	09/07/2017	Process Water	0	0
J2 Range Northern	MW-640M1	MW-640M1_F17	N	09/07/2017	Ground Water	246	256
Demolition Area 1	D1-EFF	D1-EFF-86A	N	09/07/2017	Process Water	0	0
Demolition Area 1	D1-MID-2	D1-MID-2-86A	N	09/07/2017	Process Water	0	0
Demolition Area 1	D1-MID-1	D1-MID-1-86A	N	09/07/2017	Process Water	0	0
Demolition Area 1	D1-INF	D1-INF-86A	N	09/07/2017	Process Water	0	0
J2 Range Northern	MW-632M2	MW-632M2_F17	N	09/07/2017	Ground Water	229.5	239.5
Demolition Area 1	PR-EFF	PR-EFF-138A	N	09/07/2017	Process Water	0	0
Demolition Area 1	PR-MID-2	PR-MID-2-138A	N	09/07/2017	Process Water	0	0
J2 Range Northern	MW-632M1	MW-632M1_F17	N	09/07/2017	Ground Water	254.5	264.5
Demolition Area 1	PR-MID-1	PR-MID-1-138A	N	09/07/2017	Process Water	0	0
Demolition Area 1	PR-INF	PR-INF-138A	N	09/07/2017	Process Water	0	0
Demolition Area 1	FPR-2-EFF-A	FPR-2-EFF-A-138A	N	09/07/2017	Process Water	0	0
Demolition Area 1	FPR-2-GAC-MID1A	FPR-2-GAC-MID1A-138A	N	09/07/2017	Process Water	0	0
J2 Range Northern	MW-318M2	MW-318M2_F17	N	09/07/2017	Ground Water	205.8	215.8
Demolition Area 1	FPR2-POST-IX-A	FPR2-POST-IX-A-138A	N	09/07/2017	Process Water	0	0
Demolition Area 1	FPR-2-INF	FPR-2-INF-138A	N	09/07/2017	Process Water	0	0
J2 Range Northern	MW-318M1	MW-318M1_F17	N	09/07/2017	Ground Water	305.8	315.8
J2 Range Northern	MW-622M2	MW-622M2_F17	N	09/06/2017	Ground Water	220.4	230.4
J2 Range Northern	MW-622M1	MW-622M1_F17	N	09/06/2017	Ground Water	245.4	255.4
J2 Range Northern	MW-585M3	MW-585M3_F17	N	09/06/2017	Ground Water	198.5	208.5
J2 Range Northern	MW-585M3	MW-585M3_F17D	FD	09/06/2017	Ground Water	198.5	208.5
J2 Range Northern	MW-585M2	MW-585M2_F17	N	09/06/2017	Ground Water	218.5	228.5
J2 Range Northern	MW-585M2	MW-585M2_F17D	FD	09/06/2017	Ground Water	218.5	228.5

N = Normal Sample
FD = Field Duplicate

TABLE 1

Sampling Progress: 1 September to 30 September 2017

Area Of Concern	Location	Field Sample ID	Sample Type	Date Sampled	Matrix	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)
J2 Range Northern	MW-585M1	MW-585M1_F17	N	09/06/2017	Ground Water	240	250
J2 Range Northern	MW-585M1	MW-585M1_F17D	FD	09/06/2017	Ground Water	240	250
J1 Range Southern	J1S-EFF	J1S-EFF-118A	N	09/05/2017	Process Water	0	0
J1 Range Southern	J1S-MID-2	J1S-MID-2-118A	N	09/05/2017	Process Water	0	0
J2 Range Northern	J2EW0001	J2EW0001_F17	N	09/05/2017	Ground Water	179	234
J1 Range Southern	J1S-INF-2	J1S-INF-2-118A	N	09/05/2017	Process Water	0	0
J3 Range	J3-EFF	J3-EFF-132A	N	09/05/2017	Process Water	0	0
J3 Range	J3-MID-2	J3-MID-2-132A	N	09/05/2017	Process Water	0	0
J3 Range	J3-MID-1	J3-MID-1-132A	N	09/05/2017	Process Water	0	0
J3 Range	J3-INF	J3-INF-132A	N	09/05/2017	Process Water	0	0
J2 Range Northern	J2EW0002	J2EW0002_F17	N	09/05/2017	Ground Water	198	233
J2 Range Northern	J2EW0002	J2EW0002_F17D	FD	09/05/2017	Ground Water	198	233
J2 Range Northern	MW-305M1	MW-305M1_F17	N	09/05/2017	Ground Water	202.8	212.8
J2 Range Northern	MW-589M2	MW-589M2_F17	N	09/05/2017	Ground Water	211	221
J2 Range Northern	MW-589M2	MW-589M2_F17D	FD	09/05/2017	Ground Water	211	221
J2 Range Northern	MW-589M1	MW-589M1_F17	N	09/05/2017	Ground Water	240	250

N = Normal Sample
FD = Field Duplicate

TABLE 2
VALIDATED EXPLOSIVE AND PERCHLORATE RESULTS
Data Received September 2017

Area of Concern	Location ID	Field Sample ID	Top Depth (ft bgs)	Bottom Depth (ft bgs)	Date Sampled	Test Method	Analyte	Result Value	Qualifier	Units	MCL/HA	> MCL/HA	MDL	RL
J2 Range Northern	MW-302M2	MW-302M2_F17	194.4	204.4	08/15/2017	SW6850	Perchlorate	0.030	J	ug/L	2.0		0.019	0.20
J2 Range Northern	MW-331M2	MW-331M2_F17	195.3	205.3	08/15/2017	SW6850	Perchlorate	0.025	J	ug/L	2.0		0.019	0.20
J2 Range Northern	MW-331M1	MW-331M1_F17	235.4	245.4	08/15/2017	SW6850	Perchlorate	0.25		ug/L	2.0		0.019	0.20
J2 Range Northern	MW-621M2	MW-621M2_F17	219.4	229.4	08/15/2017	SW6850	Perchlorate	3.3		ug/L	2.0	X	0.019	0.20
J2 Range Northern	MW-322M1	MW-322M1_F17	245.8	255.8	08/14/2017	SW6850	Perchlorate	0.026	J	ug/L	2.0		0.019	0.20
J3 Range	MW-576M3	MW-576M3_F17	98.9	108.9	08/14/2017	SW6850	Perchlorate	0.12	J	ug/L	2.0		0.019	0.20
J3 Range	MW-576M2	MW-576M2_F17	133.9	143.9	08/14/2017	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	1.4		ug/L	0.60	X	0.025	0.20
J3 Range	MW-576M2	MW-576M2_F17	133.9	143.9	08/14/2017	SW6850	Perchlorate	6.7		ug/L	2.0	X	0.019	0.20
J3 Range	MW-576M2	MW-576M2_F17D	133.9	143.9	08/14/2017	SW6850	Perchlorate	6.8		ug/L	2.0	X	0.019	0.20
J3 Range	MW-576M1	MW-576M1_F17	173.9	183.9	08/14/2017	SW6850	Perchlorate	0.35		ug/L	2.0		0.019	0.20
J3 Range	MW-576M1	MW-576M1_F17D	173.9	183.9	08/14/2017	SW6850	Perchlorate	0.33		ug/L	2.0		0.019	0.20
J3 Range	MW-295M2	MW-295M2_F17	117	127	08/14/2017	SW6850	Perchlorate	0.059	J	ug/L	2.0		0.019	0.20
J3 Range	MW-295M1	MW-295M1_F17	145	155	08/14/2017	SW6850	Perchlorate	0.54		ug/L	2.0		0.019	0.20
J3 Range	MW-217M2	MW-217M2_F17	138	143	08/10/2017	SW6850	Perchlorate	0.53		ug/L	2.0		0.019	0.20
J3 Range	MW-653M2	MW-653M2_F17	59.3	69.3	08/10/2017	SW6850	Perchlorate	0.077	J	ug/L	2.0		0.019	0.20
J3 Range	MW-653M1	MW-653M1_F17	147.5	157.5	08/10/2017	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.30		ug/L	400		0.019	0.20
J3 Range	MW-653M1	MW-653M1_F17	147.5	157.5	08/10/2017	SW6850	Perchlorate	0.39		ug/L	2.0		0.019	0.20
J3 Range	MW-653M1	MW-653M1_F17D	147.5	157.5	08/10/2017	SW6850	Perchlorate	0.35		ug/L	2.0		0.019	0.20
J3 Range	J3EWIP2	J3EWIP2_F17	149.5	169.5	08/09/2017	SW8330	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	0.37		ug/L	400		0.019	0.20
J3 Range	J3EWIP2	J3EWIP2_F17	149.5	169.5	08/09/2017	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.60		ug/L	0.60		0.025	0.20
J3 Range	J3EWIP2	J3EWIP2_F17	149.5	169.5	08/09/2017	SW6850	Perchlorate	4.5		ug/L	2.0	X	0.019	0.20
J3 Range	J3EWIP2	J3EWIP2_F17D	149.5	169.5	08/09/2017	SW6850	Perchlorate	4.2		ug/L	2.0	X	0.019	0.20
J3 Range	90EW0001	90EW0001_F17	83.1	143.8	08/09/2017	SW6850	Perchlorate	0.30		ug/L	2.0		0.019	0.20
J3 Range	J3EW0032	J3EW0032_F17	102	152	08/09/2017	SW6850	Perchlorate	0.46		ug/L	2.0		0.019	0.20
J3 Range	J3EW0032	J3EW0032_F17	102	152	08/09/2017	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.98		ug/L	0.60	X	0.025	0.20
J3 Range	J3EW0032	J3EW0032_F17D	102	152	08/09/2017	SW8330	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	0.85		ug/L	0.60	X	0.025	0.20
J3 Range	90MP0059B	90MP0059B_F17	116.4	118.9	08/09/2017	SW6850	Perchlorate	0.10	J	ug/L	2.0		0.019	0.20
J3 Range	MW-217M3	MW-217M3_F17	101	106	08/08/2017	SW6850	Perchlorate	0.073	J	ug/L	2.0		0.019	0.20
J3 Range	MW-636M2	MW-636M2_F17	110.5	120.5	08/08/2017	SW6850	Perchlorate	0.15	J	ug/L	2.0		0.019	0.20
J3 Range	MW-636M1	MW-636M1_F17	141.6	151.6	08/08/2017	SW6850	Perchlorate	0.029	J	ug/L	2.0		0.019	0.20
J3 Range	MW-171M2	MW-171M2_F17	81	86	08/07/2017	SW6850	Perchlorate	0.20		ug/L	2.0		0.019	0.20

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

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