



U.S. Department of Energy
National Nuclear Security Administration
Livermore Field Office, Livermore, California 94551

Lawrence Livermore National Laboratory 
Lawrence Livermore National Security, LLC, Livermore, California 94551

UCRL-AR-206769-16

First Semester 2016
Compliance Monitoring Report
Lawrence Livermore National Laboratory
Site 300

Technical Editors

M. Buscheck*
L. Ferry

Contributing Authors

A. Ardary*	S. Gregory
M. Buscheck*	V. Madrid
S. Chamberlain	J. McKaskey*
Z. Demir	P. McKereghan
R. Blake	J. Radyk*
D. MacQueen	M. Taffet
M. Murphy*	R. Villarreal*

September 30, 2016

* Weiss Associates, Emeryville, California



Environmental Restoration Department

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Appendices

Appendix A. Results of Influent and Effluent pH Monitoring..... A-1

Acknowledgements

Many people support the Lawrence Livermore National Laboratory Site 300 Environmental Restoration Project. The dedication and diverse skills of all these individuals have contributed to the ongoing success of the Environmental Restoration Department activities. The editors wish to collectively thank all the contributing people and companies.

1. Introduction

This Compliance Monitoring Report (CMR) summarizes the Lawrence Livermore National Laboratory (LLNL) Site 300 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Action compliance monitoring activities performed during January through June 2016. The report is submitted in compliance with the Compliance Monitoring Plan (CMP)/Contingency Plan (CP) for Environmental Restoration at Lawrence Livermore National Laboratory Site 300 (Dibley et al., 2009a) and CMP/CP Addendum (MacQueen et al., 2013).

During the reporting period of January through June 2016, approximately 4.4 million gallons of ground water and 35.6 million cubic feet of soil vapor were treated at Site 300, removing approximately 2.6 kilograms (kg) of volatile organic compounds (VOCs), 26 grams (g) of perchlorate, 440 kg of nitrate, 41 g of Research Department Explosive (RDX), 0.055 g of a mixture of tetrabutyl orthosilicate (TBOS) and tetrakis (2-ethylbutyl) silane (TKEBS) and 1.8 g of total uranium (Table Summ-1).

Since remediation began in 1991, approximately 437.5 million gallons of ground water and one billion cubic feet of soil vapor have been treated, removing approximately 610 kg of VOCs, 1.5 kg of perchlorate, 16,000 kg of nitrate, 2.2 kg of RDX, 9.5 kg of TBOS/TKEBS, and 0.026 kg of total uranium (Table Summ-2).

2. Extraction and Treatment System Monitoring and Ground and Surface Water Monitoring Programs

Section 2 presents the monitoring results for the Site 300 remediation systems, ground water monitoring network, and surface water sampling and analyses. These results are presented and discussed by operable unit (OU) as follows:

- 2.1. General Services Area OU 1
- 2.2. Building 834 OU 2
- 2.3. Pit 6 Landfill OU 3
- 2.4. High Explosives Process Area (HEPA) OU 4
- 2.5. Building 850/Pit 7 Complex OU 5
- 2.6. Building 854 OU 6
- 2.7. Building 832 Canyon OU 7
- 2.8. Site-Wide OU 8 (Building 833, Building 801/Pit 8, Building 845/Pit 9, and Building 851)

The locations of the Site 300 OUs 1 through 8 are shown on Figure 2-1. The Pit 2, 8, and 9 Landfills (OU 8) are discussed in Section 3.

In accordance with the revised 2009 CMP/CP requirements, post-only concentration maps and isoconcentration contour maps depicting primary and secondary contaminant of concern (COC) data will be presented in the annual CMR report along with hydraulic capture zones for

all hydrostratigraphic units (HSUs) where ground water elevation and concentration data are contoured.

Treatment facility operations and maintenance issues that occurred during first semester 2016 and influent and effluent analytical data collected during first semester 2016 are included in this report. Treatment facility pH data collected during first semester 2016 are presented in Appendix A. Ground and surface water monitoring analytical data and ground water elevation measurements for the entire calendar year 2016 will be presented in the annual report. Details pertaining to five new wells installed during first semester 2016 are presented in Table 2-1.

An acronym list is located in the Table Section of this report.

During first semester 2016, shallow water-bearing zones throughout Site 300 continued to be dewatered by pumping extraction wells and prevailing drought conditions.

In this report, concentrations for most organic compounds are reported in micrograms per liter ($\mu\text{g/L}$). The primary exception is nitrate, which is reported throughout this report, in milligrams per liter (mg/L), as NO_3 .

2.1. General Services Area (GSA) OU 1

The GSA OU consists of the Eastern and Central GSA areas.

The source of contamination in the Eastern GSA was abandoned debris burial trenches that received craft shop debris. Leaching of solvents in the debris resulted in the release of VOCs to ground water.

A ground water extraction and treatment system was operated in the Eastern GSA from 1991 to 2007 to remove VOCs from ground water. VOC-contaminated ground water was extracted from three wells (W-26R-03, W-25N-01 and W-25N-24), located downgradient of the debris burial trenches, at a combined flow rate of 45 gallons per minute (gpm).

Remediation efforts in the Eastern GSA successfully reduced concentrations of TCE and other VOCs in ground water to below their respective Maximum Contaminant Level (MCL) cleanup standards set in the GSA Record of Decision (ROD) (United States [U.S.] Department of Energy [DOE], 1997). The Eastern GSA ground water extraction and treatment system was shut off on February 15, 2007 with the U.S. Environmental Protection Agency (EPA), Regional Water Quality Control Board (RWQCB) and California Department of Toxic Substances Control (DTSC) approval. As required by the GSA ROD, ground water monitoring was conducted for five years after treatment facility shutdown to determine if VOC concentrations rose or “rebounded” above MCL cleanup standards. The results of the monitoring, indicating that VOC concentrations had remained below MCL cleanup standards during the five-year post shutdown-monitoring period, were presented at the February 24, 2012 Remedial Project Manager’s (RPM) Meeting. The regulatory agencies agreed that cleanup of the Eastern GSA was complete, monitoring and reporting could cease, and that close out documentation should be submitted. Therefore, the Eastern GSA is no longer discussed in the CMRs (Dibley et al., 2012).

At the Central GSA, chlorinated solvents, mainly TCE, were historically used as degreasing agents in craft shops, such as Building 875. Rinse water from these degreasing operations was disposed of in dry wells. Typically, the dry wells were gravel-filled holes about three to four feet (ft) deep and two ft in diameter. The Central GSA dry wells were used until 1982. In 1983 and 1984, these dry wells were decommissioned and excavated.

The Central GSA ground water treatment system has been operating since 1992 removing VOCs from ground water. The current ground water extraction wellfield consists of eight wells (W-7I, W-7O, W-7P, W-7R, W-872-02, W-873-07, W-875-07 and W-875-08). With the exception of W-7I and W-7P, the entire extraction wellfield contributed to the volumes extracted during first semester 2016. The combined flow rates increased to an average rate of 9.0 gpm, with a high of 9.3 gpm in May. The Central GSA ground water treatment system also treated water from the Building 830-Distal South (830-DISS) facility. The current ground water extraction wellfield from 830-DISS connected to the Central GSA ground water treatment system consists of W-830-2216, W-830-51, W-830-52 and W-830-53. The current ground water treatment system configuration includes particulate filtration, air stripping to remove VOCs from extracted water, and granular activated carbon (GAC) to treat vapor effluent from the air stripper. Treated ground water is discharged to the surrounding natural vegetation using misting towers. A map of the Central GSA, showing the locations of monitor and extraction wells and treatment facilities is presented on Figure 2.1-1.

The Central GSA soil vapor treatment system began operation in 1994, in the GSA adjacent to the Building 875 dry well contaminant source area, removing VOCs from soil vapor. Soil vapor is currently extracted from six wells (W-7I, W-875-07, W-875-08, W-875-09, W-875-11 and W-875-15) at a combined total flow rate of approximately 28 to 33 standard cubic ft per minute (scfm). Well W-875-10 was removed from the extraction wellfield and pneumatically sealed upon the discovery of roots within the well casing in a drop-cam video. This flow rate has been fairly consistent over the operational history of this system. Simultaneous ground water extraction in the vicinity lowers the elevation of the water table and maximizes the volume of unsaturated soil influenced by vapor extraction. The current soil vapor treatment system configuration includes a water knockout chamber, a rotary vane blower, and four 140-lb vapor-phase GAC columns arranged in series. Treated vapors are discharged to the atmosphere under a regulatory permit from the San Joaquin Valley Unified Air Pollution Control District.

Construction and operational testing of the new ground water treatment system, Central GSA-North, was completed by the end of 2015. This system was intended to treat the northern plume area in the vicinity of monitor well W-889-01. At CGSA-North, water would be extracted from one extraction well, W-CGSA-2708, treated and then discharged to the re-injection well, W-CGSA-2907. The treatment system consists of a Cuno[®] filter followed by three aqueous-phase granular activated carbon (GAC) vessels (in series) to remove VOCs. The ground water treatment system was expected to operate cyclically at very low flow rates (<0.1 gpm).

Post-construction pipeline flushing and evaluation and Central GSA-North began in October 2015 to reduce or eliminate residual organic compound in the pipelines associated with the PVC glue used in construction. Some of the residual compounds from the glue pose a particular problem as they have demonstrated poor sorption to GAC. To ensure none of these compounds are discharged to the re-injection well, the entire system was put through repeated recirculation through sacrificial GAC to remove VOCs. Two additional 250-pound GAC vessels were also added to the very end of the existing pipeline as scrubbers. VOCs associated with the glue were still being detected in the pipeline in mid-November, when due to forecasted cold weather, the pipeline was drained and the entire system freeze protected for the winter. All five GAC vessels were emptied, cleaned, and filled with new GAC at that time. Although some water was extracted from the extraction well during the flushing process, this system did not

become operational during this reporting period, and no water was discharged. Additional pipeline flushing and evaluation continued in 2016. However, due to continued drought conditions the flow rate from the extraction well was so low, around eight to nine gallons per week, that the rate of desorption of the residual glue compounds exceeded that removed by the flushing through the sacrificial GACs. By the end of April 2016, VOC compounds associated with the glue were present throughout the system and bleeding off the last GAC vessel. It became apparent at this point that some other options should be considered, such as pumping from the extraction well to a collection vessel and then transporting the water to a different facility for treatment. All options are being evaluated at this time.

2.1.1. GSA Ground Water and Soil Vapor Extraction and Treatment System Operations and Monitoring

This section is organized into five subsections: facility performance assessment; operations and maintenance issues; compliance summary; and sampling plan evaluation and modifications.

2.1.1.1. GSA Facility Performance Assessment

The monthly ground water and soil vapor discharge volumes and rates and operational hours for first semester 2016 are summarized in Table 2.1-1. The total volume of ground water and vapor extracted and treated and masses removed during the reporting period are presented in Table Summ-1. The cumulative volume of ground water and soil vapor treated and discharged and masses removed are summarized in Table Summ-2. Analytical results for influent and effluent samples collected during first semester 2016 are presented in Table 2.1-2. The pH measurement results are presented in Appendix A. The CGSA-North ground water treatment system did not become fully operational during this reporting period, so no data is included in these tables or in Appendix A.

2.1.1.2. GSA Operations and Maintenance Issues

The following maintenance and operational issues interrupted continuous operations of the Central GSA ground water treatment system and soil vapor treatment system during first semester 2016:

- The ground water treatment system remained offline for the first three months of the reporting period due to the problems with the misting head motors.
- The system was restarted on April 4 after installation of new motors and fan blades. One of the replacement motors was a heavy-duty motor specifically recommended by the vendor. The ground water treatment system again shutdown on May 4 when the heavy duty misting head motor failed. The system was restarted on May 23 after the replacement of the heavy-duty motor with the regular type of motor.
- The system was offline from June 21 through June 22 for replacement of an in-line bag filter with a large capacity Cuno-type filter.

2.1.1.3. GSA Compliance Summary

The Central GSA ground water treatment system operated in compliance with the RWQCB Substantive Requirements for Wastewater Discharge during first semester 2016. The Central

GSA soil vapor treatment system operated in compliance with San Joaquin Valley Air Pollution Control District permit limitations.

2.1.1.4. GSA Facility Sampling Plan Evaluation and Modifications

The Central GSA treatment facility sampling and analysis plan complies with the monitoring requirements in the CMP/CP. The treatment facility sampling and analysis plan is presented in Table 2.1-3. No modifications were made to the plan during this reporting period.

2.1.1.5. GSA Treatment Facility and Extraction Wellfield Modifications

No modifications were made to the Central GSA ground water treatment system, soil vapor treatment system, or the extraction wellfield during this reporting period.

2.1.2. GSA Surface Water and Ground Water Monitoring

The sampling and analysis plan for ground water monitoring at the Central GSA is presented in Table 2.1-4. This table delineates and explains deviations from the sampling plan. The sampling and analysis plans for the three Eastern GSA offsite water-supply wells and the three Eastern GSA wells retained for CMP monitoring downgradient of the Central GSA, have been incorporated into Table 2.1-4.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions: a total of five required analyses in five different wells were not performed because the wells were dry, inaccessible, or there was insufficient water for sample collection; two required analysis were not performed in two wells due to inoperable pumps that are currently under investigation; and 21 required analyses in 13 different extraction wells were not performed as the wells were under construction.

2.1.3. GSA Remediation Progress Analysis

This section is organized into four subsections: mass removal; analysis of contaminant distribution and concentration trends; remediation optimization evaluation; and performance issues.

2.1.3.1. GSA Mass Removal

The monthly ground water and soil vapor mass removal estimates for first semester 2016 are summarized in Table 2.1-5. The total mass removed during the reporting period and cumulative mass estimates are summarized in Table Summ-1 and Table Summ-2, respectively.

2.1.3.2. GSA Contaminant Concentrations and Distribution

At the Central GSA, VOCs are the only COCs in ground water and soil vapor. TCE is the most prevalent VOC, comprising approximately 90% of the total VOCs. Other VOC COCs include tetrachloroethene (PCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (TCA), benzene, bromodichloromethane, and chloroform; additionally, trans-1,2-dichloroethene (trans-1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), and Freon 11 were detected in first semester 2016. The HSUs in the Central GSA are the Qt-Tnsc₁ HSU (western part of the Central GSA), Qal-Tnbs₁ HSU (eastern part of the Central GSA), and underlying Upper and Lower Tnbs₁ HSUs.

Dry Well Pad Area

A VOC plume is present in Qt-Tnsc₁ and Qal-Tnbs₁ HSU ground water in the Central GSA dry well pad area. The highest VOC and TCE concentrations have been detected in wells screened in the Qt-Tnsc₁ HSU within the Building 875 dry pad area. Prior to remediation, the historic maximum total VOC concentration detected in Central GSA ground water was 272,000 µg/L in a bailed ground water sample collected during drilling of the Building 875 dry well pad area dual extraction well W-875-07 in March 1992. Total VOC concentrations in the Building 875 dry well area have decreased to a first semester 2016 maximum of 480 µg/L in dual extraction well W-875-07 (April). While most of the VOCs detected in the Building 875 dry well area consist of TCE, other VOCs in this area detected during the reporting period included PCE, cis-1,2-DCE, 1,1-DCE, trans-1,2-DCE, 1,1-DCA, and 1,2-DCA. Of these VOCs, only TCE, PCE, and cis-1,2-DCE were present at concentrations that significantly exceeded their MCL cleanup standards while 1,2-DCA was detected at its MCL cleanup standard of 0.5 µg/L.

Overall, a decreasing trend of VOC concentrations in ground water continued in first semester 2016 in the dry well pad area. For example, TCE concentrations have decreased from a historic maximum of 240,000 µg/L in dual extraction well W-875-07 (1993) to a first semester 2016 maximum of 410 µg/L (April). PCE concentrations have decreased from a historic maximum of 25,000 µg/L (W-875-07, 1993) to a first semester 2016 maximum of 52 µg/L (April). In dual extraction well W-7I, cis-1,2-DCE and 1,1-DCA concentrations have decreased from a 1993 historic maximum of 16,000 µg/L and 38 µg/L respectively, to 43 µg/L (April) and below the 5.0 µg/L MCL cleanup standard at 0.53 µg/L (April). Concentrations of 1,1-DCE have decreased from a historic maximum of 860 µg/L (W-7I, 1993) to a first semester 2016 maximum of 4.3 µg/L (W-7I, April).

During first semester 2016, TCE soil vapor concentrations in the Building 875 dry well pad area (wells W-7I, W-875-07, W-875-08, W-875-09, W-875-10, W-875-11, W-875-12 and W-875-15) ranged from below reporting limits to 0.11 parts per million on a volume per volume basis (ppm_{v/v}). These vapor concentrations have decreased significantly from the historic maximum TCE vapor concentration of 530 ppm_{v/v} detected in extraction well W-875-07 in 1994.

Outside the Dry Well Pad Area

Outside the Building 875 dry well pad area, wells monitor the (1) Qt-Tnsc₁ and the Qal-Tnbs₁ HSUs, (2) Upper Tnbs₁ HSU and (3) Lower Tnbs₁ HSU.

Qt-Tnsc₁ and Qal-Tnbs₁ HSUs

For monitor wells outside of the dry well pad area screened in the Qt-Tnsc₁ and the Qal-Tnbs₁ HSUs, the historic maximum total VOC concentration was detected in well W-7O (screened in the Qt-Tnsc₁ HSU) at 920 µg/L (1994), declining to a first semester 2016 maximum total VOC concentration of 57 µg/L (April). Alongside TCE, PCE, cis-1,2-DCE, 1,1-DCE, trans-1,2-DCE, and Freon 11 were also detected in wells outside of the dry well pad area; of these VOCs, only TCE was present above its MCL cleanup standard of 5 µg/L.

Upper Tnbs₁ HSU

One monitor well is screened in the Upper Tnbs₁ HSU, W-873-01. This well has never had VOCs detected above the reporting limit since installation in 1988.

Lower Tnbs₁ HSU

Five monitor wells are screened in the deeper Lower Tnbs₁ HSU. The historic maximum total VOC concentration was detected in well W-7G at 47 µg/L (primarily TCE, 1989) declining to less than the reporting limit in all five wells during first semester 2016. VOCs have not been detected above their respective reporting limits in Lower Tnbs₁ Central GSA wells since 2001.

South of the Site 300 Boundary

South of the Site 300 boundary, 17 wells monitor the (1) Qt-Tnsc₁ HSU, (2) Upper Tnbs₁ HSU, and (3) Lower Tnbs₁ HSU.

South of the Site 300 boundary, seven monitor wells and two guard wells are screened in the Qt-Tnsc₁ HSU. During first semester 2016, total VOCs were detected in only two Qt-Tnsc₁ HSU offsite monitor wells, W-35A-01 (83 µg/L, June), and W-35A-10 (28 µg/L, June). The historic maximum total VOC concentration observed in Qt-Tnsc₁ HSU ground water south of the Site 300 boundary was detected in well W-35A-01 at 545 µg/L (comprised of 510 µg/L TCE and 30 µg/L PCE, 1991). TCE and PCE in W-35A-01 remain above their MCL cleanup standard (5 µg/L) at 76 µg/L and 5.1 µg/L, respectively.

During the reporting period, no VOCs were detected above their reporting limits in the remaining Qt-Tnsc₁ HSU Central GSA wells located south of the Site 300 boundary including guard wells W-35A-08 and W-35A-14, neither of which has had detectable VOCs since their construction in 1994.

Upper Tnbs₁ HSU

During first semester 2016, no VOCs were detected in the three monitor wells (W-35A-05, -12 and -13) screened in the Upper Tnbs₁ HSU, south of the Site 300 boundary. VOCs were last detected in this HSU south of the Site 300 boundary in 2006 (0.59 µg/L TCE, W-35A-13).

Lower Tnbs₁ HSU

No VOCs above the reporting limit were detected in the five Lower Tnbs₁ Central GSA wells located south of the Site 300 boundary during first semester 2016. VOCs have not been detected in this HSU south of the Site 300 boundary since 2014, when 0.81 µg/L total VOCs were detected at CDF1 (January).

2.1.3.3. GSA Remediation Optimization Evaluation

During first semester 2016, the combined extraction flow rates averaged 9.0 gpm, with a short-term maximum flow rate of 9.3 gpm in May. The average combined flow rate was 8.7 gpm during first semester 2015. Damaged tubing outside W-7P was discovered prior to system startup in April and the well was taken offline for the reporting period. New engineering drawings for W-7P are currently being drafted and a repair is expected in second semester 2016. W-7I was dry for the reporting period.

At the Central GSA, ground water extraction continues to capture the highest concentrations in ground water. Remediation efforts have reduced VOC concentrations in Central GSA ground water from a historic maximum of 272,000 µg/L in 1992 (W-875-07) to a first semester 2016 maximum of 410 µg/L (W-875-07, April). At the eastern edge of the VOC plume, VOC concentrations continue to decrease and remain below the 5 µg/L MCL cleanup standard in monitor wells W-26R-06 and W-26R-11.

Ground water remediation continues to reduce VOC concentrations in two key offsite performance monitor wells, W-35A-01 and W-35A-10, located within 50 and 100 ft of the southern site boundary, respectively. Well W-35A-01 appears to be within the hydraulic capture zone of the Central GSA extraction well W-875-08 based on recent capture zone analysis. Although well W-35A-10 is likely not within the hydraulic capture zone of the Central GSA extraction wellfield, VOC and TCE concentrations continue to exhibit a long-term declining trend due to hydraulic capture of VOCs upgradient of this well. TCE concentrations in W-35A-10 have declined from a historic maximum of 86 µg/L (1994) to 28 µg/L in first semester 2016 (June). No other VOCs were detected above their MCL cleanup standards in W-35A-10.

Due to the extended ground water extraction shutdown period from September 2015 to April 2016, vapor extraction wells experienced reduced efficiency during first semester 2016 as ground water elevations within the dry well pad area were shallower than the operational norm. As such, and contrary to the operational norm, substantially more VOC mass was removed in the aqueous-phase by ground water extraction than in the vapor-phase by soil vapor extraction; of the 129 grams (g) of VOCs removed during first semester 2016 at the Central GSA treatment facility, 110 g (85%) were removed in the aqueous-phase. A comparison between first semester 2015 and first semester 2016 data indicates the volume of treated soil vapor decreased by approximately 15% from 9.2 million cubic feet (cf) (2015) to 7.8 million cf (2016), and the VOC mass removed by soil vapor extraction decreased approximately 86% from 140 g (first semester 2015) to 19 g (first semester 2016). The reduction in soil vapor mass removal is attributable to the reduced efficiency of operating the vapor extraction system while ground water extraction is not performed, alongside the continuous decline of VOC concentrations within the dry well pad source area, indicative of long-term VOC source mass reduction. A comparison between ground water data indicates the volume of treated ground water increased by 34% from 641,809 (first semester 2015) gallons to 861,570 gallons (first semester 2016), and the VOC mass removed by ground water extraction increased by 80% from 61 g (first semester 2015) to 110 g (first semester 2016). Increased extraction rates are likely the result of a long recharge period extending from September 2015 to April 2016 due to misting tower motor failure, and winter precipitation recharge events. For ground water and soil vapor combined, an approximate 36% decrease in VOC mass removed occurred in first semester 2016 (129 g) compared with first semester 2015 (201 g), likely the result of reduced vapor extraction efficiency. The Central GSA treatment facility is scheduled to undergo remediation evaluation (REVAL) in second semester 2016 in an effort to optimize both ground water and soil vapor mass removal. Table Summ-1 lists the mass removed by each individual treatment facility.

2.1.3.4. GSA OU Remedy Performance Issues

Due to problems with the misting tower head motors, the Central GSA ground water treatment system was inoperable for the majority of the first semester 2016. Otherwise, there were no new issues that affect the performance of the cleanup remedy for the GSA OU during this reporting period. The remedy continues to be effective and protective of human health and the environment, and to make progress toward cleanup.

2.2. Building 834 OU 2

The Building 834 Complex has been used to test the stability of weapons and weapon components under various environmental conditions since the 1950s. Past spills and piping leaks in the OU have resulted in soil and ground water contamination with VOCs and TBOS/TKEBs. Nitrate concentrations in Building 834 ground water that exceed the MCL cleanup standard (45 mg/L) are likely caused by a combination of natural sources and septic system leachate. Also, a former underground diesel storage tank released diesel to the subsurface.

The Building 834 OU is informally divided into three areas: the core, leachfield (septic system), and distal areas (Figure 2.2-1). The core area generally refers to the vicinity of the buildings and test cells in the center of the Building 834 Complex where the majority of contaminant releases occurred. The leachfield area is located immediately southwest of the core area. The distal (T2) area refers to the area downgradient (south) of the core and leachfield areas. A map of Building 834 OU showing the locations of monitor and extraction wells and treatment facilities is presented on Figure 2.2-1.

The Building 834 ground water treatment system and soil vapor treatment system began operation in 1995 and 1998, respectively. These systems are located in the Building 834 core area. The ground water extraction wellfield removes VOCs, nitrate, and TBOS/TKEBs from ground water within the Tpsg HSU and the soil vapor treatment system removes VOCs from soil vapor. Due to the very low ground water yield from individual extraction wells (<0.1 gpm), the ground water treatment system and soil vapor treatment system have been operated simultaneously in batch mode. Although the ground water treatment system can be operated alone, the soil vapor treatment system is not operational without ground water extraction due to the upconing of the ground water in the wells that covers the well screens and prevents soil vapor flow until the water table is sufficiently lowered.

The current extraction wellfield consists of 12 active dual extraction wells for both ground water and soil vapor. Nine extraction wells (W-834-B2, -B3, -D4, -D6, -D7, -D12, -D13, -J1, and -2001) are located within the core area and three (W-834-S1, -S12A, and -S13) within the leachfield area. All ground water extraction wells operate on a cyclic basis because they cannot sustain continuous pumping even at very low flow rates of 0.25 gpm. The ground water treatment system extracts ground water at an approximate combined total flow rate of 0.36 gpm and the soil vapor treatment system extracts soil vapor at a combined flow rate of approximately 125 to 139 scfm when all dual extraction wells are operational. The current ground water treatment system configuration includes floating hydrocarbon adsorption devices to remove the floating silicon oil, TBOS/TKEBs, and floating diesel (if any), followed by aqueous-phase GAC to remove VOCs, dissolved-phase TBOS/TKEBs, and diesel (not a COC) from ground water. Nitrate-bearing treated effluent is then discharged via a misting tower onto the landscape for uptake and utilization of the nitrate by indigenous grasses. The current soil vapor treatment system configuration includes vapor-phase GAC for VOC removal. Treated vapors are discharged to the atmosphere under an air permit issued by the San Joaquin Valley Unified Air Pollution Control District.

Since 2005, a long-term enhanced *in situ* bioremediation treatability test has been conducted at the distal T2 Area. This testing has included biostimulation to transform ground water from oxidizing to reducing conditions and bioaugmentation with KB-1TM, a natural non-pathogenic

microbial consortium capable of complete dechlorination of TCE to ethene. This long-term test is described in Section 2.2.3.4.

Figure 2.2-1 shows the locations of wells and treatment facilities in the Building 834 OU.

2.2.1. Building 834 OU Ground Water and Soil Vapor Extraction and Treatment System Operations and Monitoring

This section is organized into four subsections: facility performance assessment; operations and maintenance issues; compliance summary; and sampling plan evaluation and modification.

2.2.1.1. Building 834 OU Facility Performance Assessment

The monthly ground water and soil vapor discharge volumes and rates and operational hours for first semester 2016 are summarized in Table 2.2-1. The total volumes of ground water and vapor extracted and treated and masses removed during the reporting period are presented in Table Summ-1. The cumulative volume of ground water and soil vapor treated and discharged and masses removed are summarized in Table Summ-2. Analytical results for influent and effluent samples collected during first semester 2016 are presented in Tables 2.2-2 through 2.2-4. The pH measurement results are presented in Appendix A.

2.2.1.2. Building 834 OU Operations and Maintenance Issues

The following maintenance and operational issues interrupted continuous operations of the Building 834 ground water treatment system and soil vapor treatment system during first semester 2016:

- Both the ground water treatment system and soil vapor treatment system were shut down on November 17, 2015 for the annual winter freeze protection. This system was restarted February 8, 2016.

2.2.1.3. Building 834 OU Compliance Summary

The Building 834 ground water treatment system operated in compliance with the RWQCB Substantive Requirements for Wastewater Discharge during first semester 2016. The Building 834 soil vapor treatment system also operated in compliance with San Joaquin Valley Air Pollution Control District permit limitations during first semester 2016.

2.2.1.4. Building 834 OU Facility Sampling Plan Evaluation and Modifications

The Building 834 treatment facility sampling and analysis plan complies with the monitoring requirements in the CMP/CP. The sampling and analysis plan is presented in Table 2.2-5. No modifications were made to the plan during this reporting period.

2.2.1.5. Building 834 OU Treatment Facility and Extraction Wellfield Modifications

No modifications to the treatment facility or to the extraction wellfield were made during this reporting period.

2.2.2. Building 834 OU Ground Water Monitoring

The sampling and analysis plan for ground water monitoring is presented in Table 2.2-6. This table also delineates and explains deviations from the sampling plan.

During this reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions. A total of 73 required analyses in 27 different wells were not performed because the wells were dry or there was insufficient water to collect the samples and a total of three required analyses in one well (W-834-U1) were not performed due to restricted access to the well.

2.2.3. Building 834 OU Remediation Progress Analysis

This section is organized into four subsections: mass removal, analysis of contaminant distribution and concentration trends, remediation optimization evaluation, and performance issues.

2.2.3.1. Building 834 OU Mass Removal

The monthly ground water and soil vapor mass removal estimates for first semester 2016 are summarized in Table 2.2-7. The total mass removed during the reporting period and cumulative mass estimates are summarized in Table Summ-1 and Table Summ-2, respectively.

2.2.3.2. Building 834 OU Contaminant Concentrations and Distribution

At the Building 834 OU, VOCs (primarily TCE but also PCE, cis-1,2-DCE, 1,1,1-trichloroethane [1,1,1-TCA], and chloroform) are the primary COCs detected in ground water; TBOS/TKEBs and nitrate are the secondary COCs. These COCs have been identified in two shallow HSUs: (1) the Tpsg perched water-bearing gravel zone, and (2) the underlying Tps-Tnsc₂ perching horizon. Figure 2.2-1 shows the location of wells and treatment facility in the Building 834 OU.

2.2.3.2.1. VOCs Concentrations and Distribution

Although the overall extent of VOCs in the Building 834 OU ground water and soil vapor have not changed significantly, the maximum concentrations have decreased by more than one order-of-magnitude since remediation began in the mid-1990s. The most significant spatial changes in the extent of VOC contaminated ground water, especially beneath the core area, have resulted from decreases in the extent of saturation related to continual drought conditions and dewatering associated with remediation efforts. VOCs detected in Building 834 area ground water consist primarily of TCE and cis-1,2-DCE. Other VOCs including PCE, 1,1,1-TCA, chloroform, vinyl chloride, 1,1-DCE, 1,1,2-TCA, trans-1,2-DCE, 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113), carbon tetrachloride (CTET), as well as ethane and ethene have also been detected, albeit in much lower concentrations during recent years. The compounds cis-1,2-DCE, vinyl chloride, ethane, and ethene are the TCE microbial dechlorination breakdown products under anaerobic conditions. The detection of significant concentrations of ethane and ethene in the T2 area required biostimulation with a vinyl chloride reducing bacteria.

Core Area

The Building 834 core area continues to exhibit the highest VOC concentrations in ground water and soil vapor. VOC concentrations and distribution in ground water and soil vapor in the Tpsg and Tps-Tnsc₂ HSUs in the Building 834 core area are discussed below.

Tpsg HSU

Twenty-six wells (18 monitor and eight dual extraction) are screened in the Tpsg HSU, where active remediation has reduced total VOC ground water concentrations from a historic maximum of 1,100,000 µg/L (all TCE, W-834-D5, 1988) to a first semester 2016 maximum of 29,500 µg/L (February, extraction well W-834-C5), located approximately 100 ft south of monitor well W-834-D5. Over the past two years, the highest concentrations of total VOCs in core area Tpsg HSU wells have been observed in well W-834-C5 at 52,000 µg/L (2015), 54,000 µg/L (2014) and 60,000 µg/L (2013) illustrating an overall declining trend in total VOC concentrations in the core area.

TCE concentrations have decreased from a historic maximum of 1,100,000 µg/L in well W-834-D5 (1988) to a first semester 2016 maximum of 20,000 µg/L (January) in well W-834-C5. Since 2003, TCE concentrations in the Tpsg HSU have been observed in this well, within a general range between 48,000 µg/L (2003) and 11,000 µg/L (2015).

In the core area, cis-1,2-DCE and, to a lesser extent, vinyl chloride are microbial dechlorination products of TCE in wells that contain TBOS/TKEBS as co-contaminants. Cis-1,2-DCE concentrations have decreased from a historic maximum of 540,000 µg/L (W-834-D4, 1990) to a first semester 2016 maximum of 9,400 µg/L (January) in well W-834-C5, about one-half the 2015 maximum of 19,000 µg/L in the same well. During the reporting period, only four core area Tpsg HSU wells had vinyl chloride concentrations above the reporting limit, two which exceeded the MCL cleanup standard (2 µg/L) including monitor wells W-834-D3 (21 µg/L, February) and W-834-D5 (6.2 µg/L, February). Although not sampled for this compound during first semester 2016, very low concentrations of ethene most recently detected in monitor well W-834-J2 (0.74 µg/L, 2012), monitor well W-834-D3 (0.66 µg/L, 2012) and extraction well W-834-B3 (0.27 µg/L, 2012) indicate at least partial degradation under biotic or abiotic processes to a benign end product.

PCE concentrations have decreased from a historic maximum of 10,000 µg/L (W-834-D3, 1993) to a first semester 2016 maximum of 67 µg/L (W-834-C5, January), about one-half the 110 µg/L detection in the same well, in 2015. Although 1,1,1-TCA was detected at a historic maximum of 33,000 µg/L in extraction well W-834-J1 (1991), this compound was not detected above the reporting limit in this or any other well, in the Building 834 OU during the first semester 2016, nor in 2015, 2014, or 2013. During first semester 2016, the compound 1,1-DCE was detected in five core area wells, above the reporting limit but not above the 6 µg/L MCL cleanup standard. During first semester 2016, the compound trans-1,2-DCE was not detected in any wells above the reporting limit but it should be noted the detection limit for this compound varied between <0.5 to <250 µg/L (in well W-834-C5) depending on sample dilution by the analytical laboratory.

During first semester 2016, the compound 1,1,2-TCA was detected in four core area wells but not above the 5 µg/L MCL cleanup standard. Freon 113 was detected in only one core area well, at a very low concentration that did not exceed the MCL cleanup standard. CTET was not observed in any core area wells above the 0.5 µg/L reporting limit, during first semester 2016.

During first semester 2016, TCE soil vapor concentrations from the core area soil vapor extraction (SVE) wells ranged from 0.05 to 1.1 ppm_{v/v}. The highest detection (1.1 ppm_{v/v}) is representative of ongoing vapor extraction operations rather than rebound conditions, as it was detected in extraction well W-834-B2 in February, approximately 18 days after the resumption of

treatment facility operations following the freeze protection shutdown period. TCE vapor concentrations have decreased by three orders-of-magnitude from a pre-remediation maximum core area concentration of 3,200 ppm_{v/v} (extraction well W-834-D4, 1989). Well W-834-D4 is located approximately 10 ft from well W-834-D5, where the historic maximum ground water VOC concentration in the Tpsg HSU was observed.

The Tpsg HSU in the core area has exhibited declining VOC trends since treatment began in 1995.

Tps-Tnsc₂ HSU

In the core area, underlying the Tpsg HSU, the Tps-Tnsc₂ HSU continues to yield the highest VOC ground water concentrations in the Building 834 OU and at Site 300. Five wells (four monitor and one dual extraction) are screened in the Tps-Tnsc₂ HSU. Total VOC concentrations in this HSU, comprised mostly of TCE, have decreased from a historic maximum of 250,000 µg/L (2002) to a first semester 2016 maximum of 110,000 µg/L (February) and PCE concentrations have decreased from a historic maximum of 7,900 µg/L (2001) to a first semester 2016 maximum of 550 µg/L (February). Both TCE and PCE maxima occurred in monitor well W-834-A1. In extraction well W-834-2001, TCE has exhibited a declining trend from a maximum concentration of 29,000 µg/L (2006) to 27 µg/L (April). Chloroform concentrations have decreased from a historic maximum of 42 µg/L (W-834-A1 and monitor well W-834-U1, 2000) to no detections above the reporting limit in all core area Tps-Tnsc₂ HSU wells during first semester 2016. The historic maximum for cis-1,2-DCE was 11,000 µg/L (W-834-U1, 2009), declining to a first semester 2016 maximum of 840 µg/L (February) in well W-834-A1.

Concentrations of 1,2-DCE were detected at a maximum concentration of 230 µg/L in well W-834-2001 (February). During first semester 2016, vinyl chloride, 1,1,1-TCA, 1,1,2-TCA, 1,1-DCE, CTET, and Freon 113 were not detected above their reporting limits in any Tps-Tnsc₂ HSU wells in the core area.

During the reporting period, TCE soil vapor concentrations from the sole core area Tps-Tnsc₂ HSU SVE well W-834-2001 ranged from 0.17 to 0.18 ppm_{v/v}. These detections are likely representative of ongoing vapor extraction operations, not rebound conditions, as it was collected in February, approximately two and one-half weeks after the resumption of treatment facility operations following the winter freeze protection shutdown period. The historic maximum TCE vapor concentration from this well was 30 ppm_{v/v} (April 2011), and representative of rebound conditions following a prolonged period of treatment facility shutdown. Higher vapor concentrations may be observed after an extended rebound period.

Leachfield Area

VOC concentrations and distribution in ground water and soil vapor in the Tpsg and Tps-Tnsc₂ HSUs in the Building 834 leachfield area are discussed below.

Tpsg HSU

In the leachfield area, six wells (three monitor and three dual extraction) are screened in the Tpsg HSU. Total VOCs in this HSU have decreased from a pre-remediation maximum of 179,200 µg/L (mostly TCE, W-834-S1, 1988) to a first semester 2016 maximum of 3,000 µg/L (entirely TCE, February) in monitor well W-834-2113, down from 8,800 µg/L (almost entirely TCE) detected in August 2015. The historic maximum PCE detection was 6,300 µg/L (W-834-S1, 1986) declining to a first semester 2016 maximum of 49 µg/L (same well, February)

that is also down from the 2015 maximum of 56 µg/L (same well, September). Concentrations of cis-1,2-DCE have decreased from a historic maximum of 3,900 µg/L (W-834-S13, 2003) to a first semester 2016 maximum of 80 µg/L (W-834-S1, February). The historic maximum chloroform detection was 3.4 µg/L (W-834-S1, 1989). During first semester 2016, chloroform was not detected in any leachfield area Tpsg HSU wells. Concentrations of 1,1-DCE were not detected above the reporting limit during first semester 2016, having decreased from a historic maximum of 30 µg/L (W-834-S1, 1985). Concentrations of 1,1,1-TCA have decreased from a historic maximum of 300 µg/L (W-834-S1, 1986) to below reporting limits in all area wells during first semester 2016. CTET, vinyl chloride and Freon 113 were also not detected in any leachfield area Tpsg HSU wells, during the reporting period.

During first semester 2016, TCE soil vapor concentrations in the leachfield area Tpsg HSU ranged from 0.34 to 3.6 ppm_{v/v}, significantly lower than the 710 ppm_{v/v} maximum pre-remediation concentration measured in 2004 in well W-834-S13. The highest detection (3.6 ppm_{v/v}) is representative of ongoing dual extraction operations, not rebound conditions, as it was collected from extraction well W-834-S12A, approximately 18 days after the resumption of treatment facility operations in February following the freeze protection shutdown period.

The Tpsg HSU in the leachfield area has exhibited declining VOC trends since treatment began in 1995.

Tps-Tnsc₂ HSU

In the leachfield area, the underlying Tps-Tnsc₂ HSU (monitored by two wells, W-834-S8 and -S9) exhibits VOC concentrations significantly lower than in the overlying Tpsg HSU or in the core area. Total VOC concentrations in Tps-Tnsc₂ HSU ground water have decreased from a historic maximum of 16,000 µg/L (entirely TCE, W-834-S8, 1992) to a first semester 2016 maximum of 4,200 µg/L (almost entirely TCE, W-834-S8, February).

PCE concentrations have declined from a historic maximum of 170 µg/L (W-834-S8, 1993) to a first semester 2016 maximum of 38 µg/L (W-834-S8, February). Cis-1,2-DCE concentrations have decreased from a historic maximum of 130 µg/L (W-834-S8, 1991) to a first semester 2016 maximum of 58 µg/L (W-834-S8, February). 1,1,1-TCA has never been detected above the reporting limit in this HSU since monitoring began in 1989. Chloroform has decreased from a historic maximum of 6.1 µg/L (1993) to a first semester 2016 maximum of 2.7 µg/L (February); both maxima occurred in W-834-S8. 1,1-DCE concentrations in first semester 2016 were very low in both wells (0.84 µg/L, W-834-S8, February and 0.87 µg/L, W-834-S9, February). Freon 113 and vinyl chloride were not detected above the reporting limit during first semester 2016. Trans-1,2-DCE was detected for the first time in leachfield area Tps-Tnsc₂ HSU wells at very low concentrations (0.56 µg/L, W-834-S9, February and 0.52 µg/L, W-834-S8, February) but was likely due to the analytical low reporting limit during first semester 2016 relative to reporting limits applied to previous data. During first semester 2016, CTET (not a COC) was detected in well W-834-S8 at 0.93 µg/L, slightly above the state MCL cleanup level of 0.5 µg/L. This detection represents a historic maximum for carbon tetrachloride that has been detected three times historically, in this well, all slightly above the state MCL cleanup level of 0.5 µg/L. This compound has never been detected in well W-834-S9 above the reporting limit.

The Tps-Tnsc₂ HSU in the leachfield area continues to exhibit declining VOC trends since monitoring began in 1989.

Distal Area

VOC concentrations and distribution in ground water in the Tpsg, Tps-Tnsc₂, and Tnbs₁ HSUs in the Building 834 distal area are discussed below.

Tpsg HSU

The distal area includes 20 monitor wells completed in the Tpsg HSU. Since 2005, this HSU (in the T2 area) has been the target of a long-term enhanced *in situ* bioremediation treatability study, discussed in Section 2.2.3.4 of this report.

Total VOC concentrations in this area have decreased from a historic maximum of 86,000 µg/L (entirely TCE, well W-834-T2A, 1988) to a first semester 2016 maximum of 5,590 µg/L (mostly TCE, W-834-2117, February). This first semester 2016 concentration was similar to the 2015 maximum of 5,200 µg/L (mostly TCE) detected in this well.

PCE concentrations have decreased from a historic maximum of 160 µg/L (W-834-S6, 1987) to a first semester 2016 maximum of 48 µg/L (W-834-2117, February). Except for this well and well W-834-2119 (20 µg/L, February) PCE did not exceed the reporting limit in any distal area Tpsg HSU wells during first semester 2016. Cis-1,2-DCE has decreased from a historic maximum of 6,200 µg/L in W-834-T2 (2008) to a first semester 2016 maximum of 520 µg/L (W-834-1824, February). During first semester 2016, concentrations of cis-1,2-DCE were also detected in wells W-834-T2 (440 µg/L), W-834-T2A (330 µg/L), and W-834-2117 (38 µg/L). During the reporting period, concentrations of 1,1,2-TCA have decreased from a historic maximum of 200 µg/L (W-834-T2D, 1991) to below the reporting limit in all but two wells at concentrations below the MCL cleanup standard of 5 µg/L. Chloroform has decreased from a historic maximum concentration of 270 µg/L (W-834-M1, 1999) to a first semester 2016 maximum of 2.1 µg/L (February) in well W-834-2117. This concentration (2.1 µg/L) is far below its MCL cleanup standard of 80 µg/L and except for a detection of 1.3 µg/L in well W-834-M1 (February) was the only chloroform detection above the reporting limit in all distal area Tpsg HSU wells. During first semester 2016, the only vinyl chloride detections above the reporting limit, were observed in wells W-834-T2A (200 µg/L, February), W-834-T2 (190 µg/L, February) and W-834-1824 (4.8 µg/L, February). These vinyl chloride detections are within the range of concentrations observed in these wells in recent years. During first semester 2016, in distal area Tpsg HSU wells, 1,1-DCE was detected at a very low concentration in only two wells and trans-1,2-DCE, Freon 113, and CTET were not detected in any area wells. In May, ethane did not exceed the reporting limit (<0.64 µg/L) in T2 area wells W-834-T2, W-834-T2D, W-834-T2, W-834-T2A, W-834-T2D, W-834-1833, W-834-2117, and W-834-2118. In May, ethene was detected in T2 area wells W-834-T2 (460 µg/L), W-834-T2A (420 µg/L), and W-834-1824 (2.2 µg/L) and did not exceed the reporting limit (≤0.64 µg/L) in wells W-834-2117, W-834-2118, W-834-T2D, and W-834-1833. The presence of ethene and vinyl chloride are the most significant indicators of ongoing anaerobic dechlorination related to biostimulation and bioaugmentation in the T2 area.

During first semester 2016, the Tpsg HSU in the distal area has continued to exhibit declining VOC trends since monitoring began in 1989.

Tps-Tnsc₂ HSU

The underlying Tps-Tnsc₂ HSU is monitored by well W-834-2119, which yielded a first semester 2016 maximum total VOC concentration of 13,000 µg/L (nearly all TCE, February), similar to the maximum 2015 concentration of 15,000 µg/L detected in this well. After an initial

increase between 2005 (when monitoring began) and 2007, VOC concentrations in this well have since been relatively stable in a range between 11,000 µg/L and 16,700 µg/L. In this well, first semester 2016 (February) maximum concentrations of primary COCs were 20 µg/L PCE, 49 µg/L cis-1,2-DCE, and 3.6 µg/L chloroform. Freon 113, 1,1,1-TCA and vinyl chloride did not exceed reporting limits. Other VOCs in the first semester 2016 sample included trans-1,2-DCE (1.4 µg/L), 1,1-DCE (2.3 µg/L), and Freon 11 (1.5 µg/L), none of which exceeded their MCL cleanup standards. CTET was detected during the first semester 2016 at 1.4 µg/L, exceeding the state MCL cleanup level of 0.5 µg/L. This detection is consistent with historic results, when CTET has been detected four times (2006, 2010, 2014 and 2015) in a range between 1.4 and 1.9 µg/L, all slightly above the state MCL cleanup level of 0.5 µg/L.

Tnbs₁ HSU

In the distal area, the deeper Tnbs₁ HSU is monitored by wells W-834-T1 and W-834-T3. VOCs were not detected in samples collected in February and May during first semester 2016 and have not been detected since (1) 1986 and 1987 when very low concentrations (less than 4 µg/L) were detected immediately following well installation and were likely due to some cross contamination from shallow soil, during drilling of W-834-T1, and (2) 1994 when 1 µg/L was detected in W-834-T3.

2.2.3.2.2. TBOS/TKEBS Concentrations and Distribution

TBOS/TKEBS concentrations in ground water have decreased from a historic maximum of 7,300,000 µg/L (core area Tpsg HSU monitor well W-834-D3, 1995) to a first semester 2016 maximum of 120 µg/L (same well, February). From 2010 through 2014, maximum TBOS/TKEBS concentrations in well W-834-D3 ranged from 96,000 µg/L to 13,000 µg/L. The maximum 2015 TBOS/TKEBS concentration in W-834-D3 was 25 µg/L.

The well with the 2015 maximum TBOS/TKEBS concentration (core area Tpsg HSU extraction well W-834-B2, 73 µg/L) did not exceed the reporting limit, in a sample collected in February. In fact, the only other well at the Building 834 OU with detectable TBOS/TKEBS was W-834-D4 at 17 µg/L. All other wells were below the reporting limit of 10 µg/L.

In the core area, ten Tpsg HSU wells yielded detectable TBOS/TKEBS during 2015, ranging from 15 to 73 µg/L. During first semester 2016, only two Tpsg HSU wells yielded detectable TBOS/TKEBS (W-834-D3, 120 µg/L and W-834-D4, 17 µg/L). This compound is a light, non-aqueous-phase liquid (LNAPL) that is found primarily in the core area, with the highest concentrations in the Tpsg HSU. TBOS/TKEBS concentrations differ significantly from one sampling event to the next. Although several attempts have been made to identify and measure TBOS/TKEBS as floating product, it was last observed in some core area wells in the mid-1990s. Wells that contain TBOS/TKEBS as co-contaminants with TCE, generally exhibit the highest concentrations of microbial degradation products, such as cis-1,2 DCE and vinyl chloride that accumulate under anaerobic conditions when the soil vapor extraction system is not operational.

Because TBOS/TKEBS concentrations in Tpsg HSU wells in the leachfield and distal areas have historically been low or below reporting limits, sampling for TBOS/TKEBS in the leachfield and distal areas are performed biennially, with approximately half the wells sampled during even numbered years and half sampled during odd numbered years. In the leachfield and distal area Tpsg HSU wells sampled during first semester 2016, TBOS/TKEBS concentrations

were below reporting limits. Historically, these wells have been below reporting limits for TBOS/TKEBS.

The concentration and extent of TBOS/TKEBS in ground water are greater in the Tpsg HSU than the underlying Tps-Tnsc₂ HSU because this compound is an LNAPL not a dense, non-aqueous-phase liquid (DNAPL). The historic maximum TBOS/TKEBS detection in the Tps-Tnsc₂ HSU is 110 µg/L (W-834-U1, 2009). During the reporting period, TBOS/TKEBS were below the reporting limits in a routine and duplicate samples collected in one well screened in the Tps-Tnsc₂ HSU, core area extraction well W-834-2001 (February). During the reporting period, TBOS/TKEBS remained below the reporting limit in guard wells W-834-T1 and W-834-T3.

2.2.3.2.3. Nitrate Concentrations and Distribution

During first semester 2016, nitrate concentrations in Tpsg HSU ground water exceeded the 45 mg/L MCL cleanup standard in the Building 834 core, leachfield, and distal areas. During the reporting period, nitrate in Tpsg HSU ground water ranged from a maximum concentration of 380 mg/L (February) in core area monitor well W-834-D12 to below the 0.5 mg/L reporting limit.

In the core area, first semester 2016 nitrate concentrations in the Tpsg HSU varied spatially and temporally. This may be due to denitrification associated with the ongoing intrinsic *in situ* biodegradation of TCE. Nitrate concentrations in Tpsg HSU ground water exceeded the 45 mg/L MCL cleanup standard in: (1) ten core area wells at concentrations ranging from 57 to 380 mg/L, (2) three leachfield area wells at concentrations ranging from 130 to 140 mg/L, and (3) six distal area wells at concentrations ranging from 68 to 310 mg/L. All of these detections were within the historical range of nitrate concentrations observed in these wells since 2006. Nitrate detections in all other Tpsg HSU wells were below the MCL cleanup standard (45 mg/L) many of which did not exceed the reporting limit. For core area wells screened in the Tpsg HSU, the number of wells with nitrate concentrations exceeding the 45 mg/L MCL cleanup standard decreased from 11 wells in 2015 to 10 wells in the first semester 2016. Although both natural (soil) and anthropogenic sources contribute to the nitrate in the perched ground water, the anthropogenic sources are likely the most significant.

In the underlying Tps-Tnsc₂ HSU, first semester 2016 nitrate concentrations in ground water exceeded the 45 mg/L MCL cleanup standard in (1) only one core area well (W-834-1711, 87 mg/L, January), (2) two leachfield area wells (W-834-S8, 140 mg/L, February and W-834-S9, 75 mg/L, February), (3) one distal area well (W-834-2119, 100 mg/L, February), and (4) one well south of the distal area (W-834-T5, 100 mg/L, February). All of these detections were within the historical range of nitrate concentrations observed in these wells since 2006. Nitrate detections in all other Tps-Tnsc₂ HSU wells were below the nitrate MCL cleanup standard (45 mg/L) many of which did not exceed the reporting limit.

Nitrate concentrations in ground water have decreased from a historic maximum of 749 mg/L (monitor well W-834-K1A, 2000) to a first semester 2016 maximum of 380 mg/L (W-834-D12, February). However, the continued presence of elevated nitrate indicates that an ongoing source of nitrate to ground water exists, likely due to a combination of both natural and anthropogenic sources including the proximity of the septic system leachfield system, in the leachfield area. During first semester 2016, nitrate was not detected in guard wells W-834-T1 and W-834-T3.

2.2.3.2.4. Other Contaminant Concentrations and Distribution

The extent of diesel in ground water in the Building 834 area is limited to the vicinity of a former underground storage tank located beneath the paved portion of the core area. Diesel concentrations have decreased from a historic maximum of 3,900,000 µg/L (W-834-2001, 2004) to concentrations not exceeding the reporting limit of 200 µg/L, during first semester 2016 maximum (including well W-834-2001, February). Diesel concentrations measured in ground water tend to vary from one sampling event to the next, likely due to varying amounts of free-phase product in the subsurface and fluctuating ground water levels. No floating product was observed in ground water during first semester 2016.

Perchlorate concentrations have decreased from a historic maximum of 11 µg/L (W-834-2118, 2005) to a first semester 2016 maximum of 4.3 µg/L (W-834-2118, February) below the MCL cleanup standard of 6 µg/L. Perchlorate concentrations in well W-834-A2 did not exceed the reporting limit of 0.5 µg/L during first semester 2016. Well W-834-S7 has historically contained perchlorate at concentrations ranging between 8.8 to 11 µg/L. Attempts to sample well W-834-S7, in February were unsuccessful because the well was dry. Semi-annual monitoring for perchlorate will continue for wells W-834-2118, W-834-S7 and W-834-A2.

2.2.3.3. Building 834 OU Remediation Optimization Evaluation

During the reporting period, no modifications were made to the core or leachfield area extraction wellfields. As has been the case historically, during first semester 2016, substantially more VOC mass was removed by soil vapor extraction than by ground water extraction. Of the 1,740 g of VOCs removed during first semester 2016, 1,500 g (86%) were removed in the vapor-phase. For ground water and soil vapor combined, an approximate 32% increase in VOC mass removed occurred during first semester 2016 (1,740 g) compared with first semester 2015 (1,320 g). This increase was due to an increase in soil vapor volumes removed. During first semester 2016, the volume of treated ground water increased by approximately 25% from 52,000 gallons (first semester 2015) to 65,000 gallons (first semester 2016) and the volume of treated soil vapor increased by 52% from 16,586,000 cf (first semester 2015) to 25,232,000 cf (first semester 2016). These increases are likely due to more efficient and continual operation of the treatment facility. During first semester 2015, the system was not restarted until mid-March following the winter shutdown period and operated for only three and one-half months. Also, the treatment facility blower was not running at full capacity during some of 2015. During first semester 2016, the system was restarted in early February and operated for nearly four and three-quarters months.

During first semester 2016, the total nitrate mass removed was 36 kg, an increase of approximately 44% from first semester 2015 when 25 kg of total nitrate was removed. This is due to the higher concentrations of nitrate detected in 10 core area Tpsg HSU wells, during first semester 2016, described in Section 2.2.3.2.3. The total TBOS/TKEBS mass removed was 0.055 g, a significant decrease from first semester 2015 when 3.9 grams were removed. This is primarily due to the reduction in the number of core area wells with detectable TBOS/TKEBS, from 10 wells in 2015 to two wells during first semester 2016. Table Summ-1 lists the mass removed by each individual treatment facility.

Core Area

Dual extraction operations in the core area and regional drought conditions continue to dewater the Tpsg HSU. TCE biodegradation continues within the core area where significant amounts of TBOS/TKEBS are present and, when hydrolyzed, serves as an electron donor for biodegradation. Historically, the primary biodegradation byproduct has been cis-1,2-DCE, although vinyl chloride and trace detections of ethene have also been historically detected in some wells, especially in well W-834-D3. In the core area, cis-1,2-DCE and vinyl chloride are degradation products of intrinsic anaerobic biodegradation of TCE. Low concentrations of ethene (0.74 µg/L in W-834-J2 and 0.66 µg/L in W-834-D3, both 2012) suggest at least partial degradation to a benign end product.

During first semester 2016, both cis-1,2-DCE and vinyl chloride were observed in core area Tpsg HSU ground water at maximum concentrations of 9,400 µg/L (W-834-C5, January) and 21 µg/L (W-834-D3, February), respectively. During first semester 2016, ground water samples from core area wells (and all OU wells) were not analyzed for ethane and ethene.

The Tpsg HSU extraction wellfield within the core area continues to adequately capture the highest VOC concentrations in ground water. Per the recommendations presented in the third Five-Year Review Report for the Building 834 Operable Unit (Valett et al., 2012), VOC concentrations in monitor well W-834-C5 and nearby well W-834-B4 will continue to be observed closely during the subsequent five years (2011-2016). If these wells exhibit increasing VOC trends, installation of extraction wells in the vicinity of these wells may be considered. Since both wells were installed in 2000, VOCs in W-834-C5 have fluctuated with no apparent increasing or decreasing long-term trend and W-834-B4 has remained generally stable with a decreasing trend since 2010.

VOC concentration trends in the underlying Tps-Tnsc₂ HSU will also continue to be monitored closely during the five years (2011-2016) subsequent to the last Five-Year Review Report. Per the recommendations presented in the Building 834 Five-Year Review, if well W-834-A1 exhibits increasing VOC trends, installation of additional extraction wells in this area will be considered. Total VOC concentrations in this well have decreased from a historic maximum of 250,000 µg/L (2001) to a first semester 2016 maximum of 110,000 µg/L. Since 2011, there has been a decreasing VOC concentration trend in this well.

Leachfield Area

In the leachfield area, the extraction wellfield continues to capture some portions of the VOC plume in Tpsg HSU ground water. However, the areas with the highest concentrations (in the vicinity of monitor well W-834-2113) are not fully captured. In accordance with recommendations presented in the Building 834 Five Year Review, the leachfield area is currently undergoing an extraction wellfield expansion by converting W-834-2113 from a monitor to extraction well as of June 2016. This wellfield expansion should be completed during calendar year 2016.

VOC concentration trends in the underlying Tps-Tnsc₂ HSU will also continue to be monitored closely during the five years (2011-2016) subsequent to the most recent Building 834 Five-Year Review. Per the recommendations presented in the Building 834 Five-Year Review, if distal area monitor well W-834-2119 exhibits increasing VOC trends, installation of additional extraction wells in this area may be considered. Since 2007, VOC concentration trends have remained generally flat, within a range of 11,000 to 16,700 µg/L

VOCs in ground water are expected to continue to decrease as remediation progresses. The deep regional Tnbs₁ aquifer continues to be free of contaminants as demonstrated by quarterly analyses of ground water as recently as May 2016 from guard wells W-834-T1 and W-834-T3, both screened in the Lower Tnbs₁ HSU.

2.2.3.4. T2 Treatability Study

Since 2005, the Tpsg HSU in the distal area has been the target of a long-term enhanced *in situ* bioremediation treatability study, including biostimulation using sodium lactate (April 2007 to December 2008) and bioaugmentation (August 2008) using KB-1TM, a consortium of dechlorinating bacteria that contain *Dehalococcoides ethenogenes*. This treatability study included post-test rebound monitoring to determine if VOC concentrations rebound after biostimulation and bioaugmentation was suspended (January 2009 to present).

The primary objective of this pilot-scale treatability study was to assess the performance of enhanced *in situ* bioremediation of TCE at concentrations greater than 10,000 µg/L in a water-bearing zone typical of TCE contaminant source areas at Site 300. In particular, the T2 area was specifically selected for this *in situ* pilot study due to: (1) the presence of challenging source area remediation conditions such as low hydraulic conductivity, subsurface heterogeneity, and limited recharge; and (2) the low potential for negatively impacting ground water with beneficial uses (i.e., perched ground water, isolated laterally and vertically from any receptors or ground water of beneficial use). Since 2005, progress of this test has been reported semi-annually and annually in the CMRs and in OU2 Five Year Reports.

During 2015, a draft final Phase 2 pilot study work plan describing enhanced *in situ* bioremediation of TCE was submitted to regulators for review (LLNL, 2015). Planned activities included expansion of the original *in situ* bioremediation treatment zone at T2 by (1) implementing a small-scale recirculation cell extracting ground water from two nearby wells, W-834-T2A and W-834-T2D, (2) continuing to use well W-834-1824 as an injection well for biostimulation with a more effective form of lactate (ethyl lactate), and (3) continued use of wells W-834-T2, W-834-1825 and W-834-1833 as performance monitor wells. In 2014, ground water in wells W-834-1824, W-834-1833 and W-834-T2 was sampled for analysis of *Dehalococcoides ethenogenes* bacteria, volatile fatty acids, and light hydrocarbons (W-834-1825 was scheduled but did not have sufficient water for sampling). The results indicated that Phase 1 *in situ* bioremediation continues to be successful within the treatment zone based on the continued presence of ethene, and the continued decrease in total VOCs. However, because water levels have declined in several of the T2 area wells even to below the bottom of the well screens, sufficient ground water necessary for the implementation of the small-scale recirculation cell is not available. This is due to the continuing regional drought conditions and the ongoing upgradient dual extraction operations in the Building 834 core and leachfield areas. Therefore, the expansion of the original *in situ* bioremediation treatment zone at the T2 is delayed until more favorable hydraulic conditions return to this area. However, biostimulation and bioaugmentation continue to completely transform TCE into the benign end product ethene, as demonstrated by most recent performance ground water monitoring data presented below.

W-834-T2: Following the sodium lactate injections into injection well W-834-1824 in April 2007 and the bioaugmentation with KB-1TM into bioaugmentation well W-834-1825, total VOC concentrations in well W-834-T2 decreased from a baseline concentration of 10,000 µg/L in January 2007 to a low of 680 µg/L in February 2016. While TCE rapidly decreased from

10,000 $\mu\text{g/L}$ in January 2007 to 450 $\mu\text{g/L}$ in June 2008, cis-1,2-DCE concentrations concurrently increased from below the laboratory reporting limit to 5,400 $\mu\text{g/L}$. Vinyl chloride and ethene were not detected during the same time period, indicating that indigenous bacteria capable of dechlorination beyond cis-1,2-DCE were not present. However, after the bioaugmentation with KB-1TM in August 2008, a rapid decrease of cis-1,2-DCE concentrations was observed with an increase in vinyl chloride concentrations and a significant increase in ethene concentrations. Current first semester 2016 concentrations of 49 $\mu\text{g/L}$ TCE, 440 $\mu\text{g/L}$ cis-1,2-DCE and 190 $\mu\text{g/L}$ vinyl chloride (February, respectively) and 460 $\mu\text{g/L}$ ethene (May) confirm that complete reductive dechlorination is still ongoing in well W-834-T2 and surrounding subsurface, although sodium lactate injections ceased in December 2008.

W-834-T2A: Total VOC concentrations in well W-834-T2A remained relatively stable at approximately 13,000 $\mu\text{g/L}$ after the start of the sodium lactate injections in 2007. By August 2011, total VOC concentrations, consisting primarily of TCE, started to decrease and were detected at 7,000 $\mu\text{g/L}$, however, without significant increases in cis-1,2-DCE and vinyl chloride. TCE concentrations continued to steadily decline and reached 3,700 $\mu\text{g/L}$ by February 2015. By February 2016, TCE had decreased significantly to 27 $\mu\text{g/L}$, while cis-1,2-DCE increased to 330 $\mu\text{g/L}$. Vinyl chloride concentrations increased from non-detect in August 2015 to 200 $\mu\text{g/L}$ in February 2016. These significant cis-1,2-DCE and vinyl chloride concentration increases are also accompanied by an increase in ethene from 0.048 $\mu\text{g/L}$ in January 2013 to 420 $\mu\text{g/L}$ in May 2016. These high ethene concentrations detected during first semester 2016 are indicative that TCE is completely dechlorinated and that the bioremediation treatment zone, created by the electron donor and KB-1TM injections, has expanded to the surrounding area of well W-834-T2A approximately eight years after its initiation. As of first semester 2016, total VOC concentrations at 558 $\mu\text{g/L}$ present a historic low, which is a significant decline from the 86,000 $\mu\text{g/L}$ detected in 1988.

W-834-1825: After the sodium lactate injections into injection well W-834-1824 in April 2007, total VOC concentrations decreased rapidly in well W-834-1825 from 3,700 $\mu\text{g/L}$ in March 2007 to a historic low of 9 $\mu\text{g/L}$ in August 2009. As of August 2013, total VOCs were detected at 80 $\mu\text{g/L}$. Due to the continuing regional drought conditions, no ground water samples have been collected since.

Only after well W-834-1825 was bioaugmented with KB-1TM in August 2008, were vinyl chloride and ethene concentrations observed. Cis-1,2-DCE rapidly declined from pre-bioaugmentation concentrations of 1,200 $\mu\text{g/L}$ to 310 $\mu\text{g/L}$ a few months after bioaugmentation, while vinyl chloride and ethene increased from non-detect to 70 $\mu\text{g/L}$ and 82 $\mu\text{g/L}$, respectively. Since then complete reductive dechlorination has been observed and as of January 2013, ethene concentrations as high as 100 $\mu\text{g/L}$ were measured, while very low concentrations of 9 $\mu\text{g/L}$ TCE, 2 $\mu\text{g/L}$ cis-1,2-DCE and 1.4 $\mu\text{g/L}$ vinyl chloride were detected. The significant detection of ethene indicates that robust and complete dechlorination is still occurring after sodium lactate additions ceased in December 2008.

W-834-1833: This performance well exhibited only limited evidence that it had been significantly impacted by any of the bioremediation study activities, although sufficient reducing conditions were created through the injection of sodium lactate so that TCE was degraded to cis-1,2-DCE. TCE decreased from baseline concentrations of 13,000 $\mu\text{g/L}$ in January 2007 to 8,400 $\mu\text{g/L}$ in January 2008, while cis-1,2-DCE concurrently increased from non-detect to 450 $\mu\text{g/L}$. Cis-1,2-DCE concentrations remained elevated and spiked at 1,400 $\mu\text{g/L}$ in

March 2010, after which concentrations declined to an August 2014 low of 4.8 $\mu\text{g/L}$. Vinyl chloride concentrations were never detected above the laboratory reporting limits throughout the bioremediation study, and only very low ethene concentrations of less than 0.73 $\mu\text{g/L}$ were observed, indicating that conditions conducive to complete reductive dechlorination were never achieved in the area surrounding this well. However, the substantial decline in TCE concentrations from 3,500 $\mu\text{g/L}$ (August 2013) to 330 $\mu\text{g/L}$ (August 2014) is most likely due to the biotransformation of TCE to ethene occurring in the T2 treatment zone located upgradient. Due to continued regional drought conditions, no ground water samples were collected during 2015 and first semester 2016.

W-834-T2D: Total VOC concentrations, primarily TCE, declined from 11,000 $\mu\text{g/L}$ in January 2007 to 2,100 $\mu\text{g/L}$ in February 2016, while cis-1,2-DCE and vinyl chloride were not present in well W-834-T2D. This performance well exhibited very little evidence that it had been impacted by any of the bioremediation study activities. As was seen with well W-834-1833, the reduction in TCE concentrations is most likely due to the biotransformation of TCE to ethene occurring in the T2 treatment zone located upgradient.

W-834-1824: This well served as the tracer injection and sodium lactate injection well during the treatability study. Over the course of this study, total VOC concentrations, primarily TCE, declined from 26,000 $\mu\text{g/L}$ in 2004 to 736 $\mu\text{g/L}$ in February 2016. As of first semester 2016, TCE, cis-1,2-DCE, and vinyl chloride were detected at 210 $\mu\text{g/L}$, 520 $\mu\text{g/L}$, and 4.8 $\mu\text{g/L}$, respectively. A detection of 2.2 $\mu\text{g/L}$ ethene in May 2016 also indicates that complete reductive dechlorination is still ongoing in the surrounding subsurface.

Additionally, total VOC concentrations in upgradient background well W-834-2117 declined from baseline concentrations of 20,000 $\mu\text{g/L}$ in January 2007 to 5,600 $\mu\text{g/L}$ in February 2016. This trend, which has also been observed in performance wells W-834-T2A, W-834-T2D and W-834-1833, is due to processes such as volatilization, diffusion, and sorption, but also in part to hydraulic capture of TCE by upgradient pumping in the Building 834 OU core and leachfield area. This dissolved TCE is decreasing over time apart from any reduction attributable to *in situ* bioremediation. Total VOC concentrations in well W-834-2118, located downgradient of the T2 treatment zone, have similarly decreased from 600 $\mu\text{g/L}$ in 2005 to 90 $\mu\text{g/L}$ in first semester 2016.

The data collected during this long-term treatability study demonstrate that enhanced *in situ* bioremediation is effectively remediating VOCs in the T2 area, which consists of recharge-limited, low-permeability, variably cemented conglomerate that contains a complex network of preferential pathways in the form of permeable sand lenses and fractures. Especially, the continued presence of ethene and vinyl chloride, and the overall reduction in total VOCs, particularly in the vicinity of wells W-834-T2, W-834-T2A and W-834-1825, indicate that enhanced *in situ* bioremediation of TCE continues in the T2 area. Addition of electron donor sodium lactate and *Dehalococcoides* microorganisms to the subsurface have established redox conditions around the injection well and performance wells that are conducive to reductive dechlorination and favorable for the use of TCE as electron acceptor.

2.2.3.5. Building 834 OU Remedy Performance Issues

During the reporting period, there were no new issues that affect the performance of the cleanup remedy for the Building 834 OU. Although declining water levels related to ongoing drought conditions and continued dual extraction in the core and leachfield areas have impacted

the ability to collect ground water samples and delayed the implementation of the second phase of the T2 enhanced bioremediation treatability test, dual extraction continues to be an effective VOC mass removal method and continues to be protective of human health and the environment. Per the recommendations presented in the Building 834 Five Year Review, VOC trends are being monitored in Tps-Tnsc₂ HSU wells and installation of additional extraction wells in this HSU may be considered to increase the effectiveness of remediation of VOCs in the Tps-Tnsc₂ HSU beneath the core area. The perched water tables beneath the 834 area in the Tpsg and Tps/Tnsc₂ HSUs continue to decline as a result of extraction operations and ongoing regional drought conditions.

2.3. Pit 6 Landfill (Pit 6) OU 3

The Pit 6 Landfill covers an area of 2.6 acres near the southern boundary of Site 300. From 1964 to 1973, this landfill was used to bury waste in nine unlined debris trenches and animal pits. The buried waste, which includes shop and laboratory equipment and biomedical waste, is located on or adjacent to the Corral Hollow-Carnegie Fault. Farther east, the fault trends to the south of two nearby water-supply wells CARNRW1 and CARNRW2. These active water-supply wells are located about 1,000 ft east of the Pit 6 Landfill. They provide water for the nearby Carnegie State Vehicular Recreation Area and are monitored on a monthly basis.

The Pit 6 Landfill was capped and closed in 1997 under CERCLA to prevent further leaching of contaminants resulting from percolation of rainwater through the buried waste. The engineered, multi-layer cap is intended to prevent rainwater infiltration into the landfill, mitigate potential damage by burrowing animals and vegetation, prevent potential hazards from the collapse of void spaces in the buried waste, and prevent the potential flux of VOC vapors through the soil. Surface water flow onto the landfill is minimized by a diversion channel on the north side and drainage channels on the east, west, and south sides of the engineered cap.

A map of Pit 6 Landfill OU showing the locations of monitor and water-supply wells are presented on Figure 2.3-1.

2.3.1. Pit 6 Landfill OU Surface Water and Ground Water Monitoring

The sampling and analysis plan for ground water and surface water monitoring is presented in Table 2.3-1. This table also delineates and explains deviations from the sampling plan.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring and post-closure requirements with the following exceptions; a total of 36 required analyses in eight different wells and four analyses for one spring were not performed because the wells and spring were not performed because the wells or spring were dry or there was insufficient water for sample collection.

The eight wells and spring that were dry or had insufficient water to sample during first semester 2016 have been dry for several years. Of these wells and spring:

- K6-15 (dry since 1999) and K6-32 (dry since 2006) are located upgradient of the Pit 6 Landfill and have never had detectable VOCs.
- K6-21 (dry since 2000) has a nearby existing well (EP6-09) screened at a greater depth within the same HSU, which had available ground water and was successfully sampled for the same required analytes.

- EP6-08 (dry since 2013) has a nearby existing well (EP6-07) screened at a greater depth within the same HSU, which had available ground water and was successfully sampled for the same required analytes.
- K6-24 (dry or had insufficient water to sample since 2011) has a nearby existing well (W-PIT6-2817) screened at a greater depth within the same HSU, which had available ground water and was successfully sampled for the same required analytes.
- K6-32 has been dry since 2008 when it was last sampled (no detectable VOCs).
- K6-36 has been dry or had insufficient water to sample since 2008 when it was last sampled (0.8 µg/L total VOCs).
- BC6-13 has been dry since 2000 when it was last sampled (4 µg/L total VOCs). This well had declining concentrations of VOCs, from 1987 through 2000.
- Spring 15 has been dry during sampling attempts since 1991 when it was last sampled.

2.3.2. Pit 6 Landfill OU Remediation Progress Analysis

This section is organized into three subsections: analysis of contaminant distribution and concentration trends; remediation optimization evaluation; and performance issues.

2.3.2.1. Pit 6 Landfill OU Contaminant Distribution and Concentration

At the Pit 6 Landfill OU, VOCs (chloroform and TCE) and tritium are the primary COCs detected in ground water. Nitrate is a secondary COC. These constituents have historically been identified within the Qt-Tnbs₁ HSU. The concentrations and activities of COCs have significantly declined below historic maximum levels in Pit 6 ground water.

The Qt-Tnbs₁ HSU is divided into the Qt-Tnbs₁ North HSU (portion north of the Corral Hollow-Carnegie Fault Zone) and the Qt-Tnbs₁ South HSU (portion within the Corral Hollow-Carnegie Fault Zone) due to the difference in hydraulic response to pumping from private CARNRW water-supply wells and seasonal rainfall events on either side of this regional fault. A deeper water-bearing zone (Tnbs₁ Deep HSU) occurs beneath a low permeability-confining layer at an approximate depth of 170 ft within the Tnbs₁ stratigraphic unit in the northern fault block. Transducers in guard wells K6-34 and W-PIT6-1819 continuously monitor water levels in the Qt-Tnbs₁ North HSU. Water level data from these wells (K6-34 and W-PIT6-1819) recorded during first semester 2016 was not available at the time of this report. These data will be discussed in the 2016 Annual Report.

2.3.2.1.1. VOC Concentrations and Distribution

The VOC COCs in Pit 6 Landfill ground water include chloroform and TCE. During first semester 2016, TCE was detected in four Pit 6 Landfill ground water monitor wells at concentrations above its 0.5 µg/L reporting limit but none of these detections exceeded the 5 µg/L MCL cleanup standard. While cis-1,2-DCE is no longer a COC, it was detected in one well, K6-01S, at a concentration of 2.1 µg/L, well below its MCL cleanup standard (6 µg/L). The maximum 2015 concentration of cis-1,2-DCE in this well was 2.3 µg/L. No other VOCs, including chloroform, were detected above applicable reporting limits, in Pit 6 wells.

In the Qt-Tnbs₁ North HSU, TCE concentrations have decreased from a historic maximum of 1.4 µg/L (monitor well K6-36, 2001) to below the 0.5 µg/L reporting limit in all Qt-Tnbs₁ North

HSU wells during first semester 2016. No other VOCs including chloroform were detected above reporting limits, in the Qt-Tnbs₁ North HSU during the reporting period.

In the Qt-Tnbs₁ South HSU, TCE concentrations have decreased from a historic maximum of 250 µg/L (monitor well K6-19, 1988) to a first semester 2016 maximum of 4.7 µg/L (monitor well EP6-09, January), below its 5 µg/L MCL cleanup standard. In 2015, the maximum TCE concentration detected in this well was 5.6 µg/L.

During first semester 2016, TCE was detected in three other Qt-Tnbs₁ South HSU wells (K6-16, K6-18 and K6-19) at concentrations above the reporting limit but well below the 5 µg/L MCL cleanup standard. Well K6-01S had detectable cis-1,2-DCE at 2.1 µg/L (January) below the 6 µg/L MCL cleanup standard. While no longer a COC, the presence of cis-1,2-DCE, a common anaerobic degradation product of TCE, suggests that some natural dechlorination may be occurring. The historic maximum cis-1,2-DCE concentration detected in K6-01S was 9.8 µg/L (1992). No other VOCs including chloroform were detected in the Qt-Tnbs₁ South HSU during the reporting period.

No VOCs, including TCE and chloroform, were detected in the Tnbs₁ Deep HSU during first semester 2016. During the reporting period, VOCs were not detected in guard wells W-PIT6-1819, K6-17, K6-22 and K6-34 nor from the two active CARNRW water-supply wells and two inactive CARNRW water-supply wells.

2.3.2.1.2. Tritium Concentrations and Distribution

Including first semester 2016, tritium has never been detected in Pit 6 Landfill ground water at activities exceeding the 20,000 pCi/L MCL cleanup standard. During first semester 2016, tritium was detected above the 100 pCi/L reporting limit in seven wells at the Pit 6 Landfill OU, including (1) four wells screened in the Qt-Tnbs₁ North HSU, and (2) three wells screened in the Qt-Tnbs₁ South HSU. In 2015, seven wells, completed in both the Qt-Tnbs₁ North and Qt-Tnbs₁ South HSUs, and one well screened in the Tts stratigraphic unit, contained tritium with activities greater than the 100 pCi/L reporting limit. All of the first semester 2016 and 2015 tritium detections were far below the MCL cleanup standard (<20,000 pCi/L), did not greatly exceed the 100 pCi/L reporting limit, and were accompanied by large analytical uncertainties, and therefore, are likely not indicative of an increasing trend in tritium activity.

In the Qt-Tnbs₁ North HSU, tritium activities have decreased from a historic maximum of 2,150 pCi/L (monitor well K6-36, 2000) to a first semester 2016 maximum of 255 ±100 pCi/L (EP6-07, January). This well last yielded detectable tritium above the 100 pCi/L reporting limit in 2003 (313 pCi/L). Although it is accompanied by a large analytical uncertainty, the reason for this first semester tritium activity in EP6-07 is unknown and will be closely monitored and discussed in future reports. During first semester 2016, tritium activities exceeding the 100 pCi/L reporting limit were also detected in Qt-Tnbs₁ North HSU wells (1) one monthly sample from CARNRW-3 (216 ±76.0 pCi/L in a January sample and all other monthly samples collected during first semester 2016 were <100 pCi/L), (2) K6-33 (140 ±92.3 pCi/L, January), (3) W-PIT6-1819 (136 ±75.5 pCi/L in an April sample and 106 ±88.1 pCi/L in a January sample).

In the Qt-Tnbs₁ South HSU, tritium activities have decreased from a historic maximum of 3,420 pCi/L (monitor well BC6-13 aka SPRING7, 2000) to a first semester 2016 maximum of 216 ±76.0 pCi/L in a monthly sample in January collected from CARNRW-4; subsequent

monthly samples from this well did not exceed the 100 pCi/L reporting limit. Also, tritium was detected in wells K6-18 (148 ± 74.0 pCi/L, January duplicate sample; the routine sample collected the same day did not exceed the 100 pCi/L reporting limit) and K6-19 (129 ± 84.2 pCi/L). Except for these wells, tritium activities in all other wells screened in the Qt-Tnbs₁ South HSU did not exceed the 100 pCi/L reporting limit during first semester 2016.

Tritium was not detected above the 100 pCi/L reporting limit in any Tnbs₁ Deep HSU wells during first semester 2016. The historic maximum tritium activity in this HSU was 1,680 pCi/L (monitor well K6-26, 1999), well below the 20,000 pCi/L MCL cleanup standard.

In 2015, tritium was detected in well W-33C-01 (187 ± 83.5 pCi/L, July 2015), located approximately 60 ft south of the Site 300 boundary within the Carnegie SVRA and screened in the Tts stratigraphic unit; this was the first detection of tritium above the reporting limit since the well was initially sampled in 2000. The 2015 Site 300 Annual CMR included a statement that the tritium activity in W-33C-01 would be closely monitored and discussed in future reports (Buscheck and Ferry, 2016). During first semester 2016, tritium did not exceed the 100 pCi/L reporting limit in this well.

Guard well W-PIT6-1819 is located approximately 100 ft west of the Site 300 boundary, within the Carnegie SVRA residence area and about 200 ft west of the CARNRW1 and CARNRW2 water-supply wells, and used to define the downgradient extent of tritium in Pit 6 ground water with activities above the 100 pCi/L background level. During 2015, the tritium activities in guard well W-PIT6-1819 were 127 ± 85.7 pCi/L (January), 137 ± 74.6 pCi/L (April), 100 ± 70.3 pCi/L (July) and 101 ± 80.5 pCi/L (October). During first semester 2016, tritium activities in this well were 106 ± 88.1 pCi/L (January) and 136 ± 75.2 pCi/L (April). These activities do not greatly exceed the reporting limit and were accompanied by large analytical uncertainties and, therefore, are likely not indicative of an increasing trend in tritium activity. Prior to January 2015, tritium activity in this well was below the reporting limit (<100 pCi/L), for five consecutive samplings (October 2013 and January, April, July, and October 2014). Since 2007, tritium activities in W-PIT6-1819 have fluctuated between 295 pCi/L and the reporting limit of <100 pCi/L and define an overall decreasing trend in tritium activity.

2.3.2.1.3. Perchlorate Concentrations and Distribution

In the 2013 Five-Year Review for OUs 3 (Pit 6 Landfill) and 8, perchlorate was removed as a COC in Pit 6 ground water. Per the Five-Year Review, perchlorate will no longer be discussed in this section unless it is detected in an OU3 monitoring well.

During first semester 2016, perchlorate was detected in two Qt-Tnbs₁ South HSU wells at Pit 6, K6-23 ($14 \mu\text{g/L}$, January) and K6-18 ($9.2 \mu\text{g/L}$, January). During 2015, perchlorate was detected above the $4 \mu\text{g/L}$ reporting limit, in only one well, K6-18 ($7.9 \mu\text{g/L}$, January), slightly above the MCL cleanup standard of $6 \mu\text{g/L}$. Perchlorate was also detected for the first time in well K6-23, since the well was installed in 1998. The reason for the detection of perchlorate in K6-23 and the increasing trend in K6-18 is not known. The perchlorate trend in wells K6-18 and K6-23 will continue to be closely monitored and an evaluation of whether there is any evidence that these perchlorate detections could be related to the Building 899 septic system or correlate to pumping activity in the nearby CARNRW water supply wells, will be reported in the 2016 annual CMR report.

Except for K6-23 and K6-18, perchlorate was not detected above the 4 µg/L reporting limit in any other Qt-Tnbs₁ South, Qt-Tnbs₁ North, or Tnbs₁ Deep HSU ground water samples, including samples collected from guard wells and the CARNRW water-supply wells.

2.3.2.1.4. Nitrate Concentrations and Distribution

During first semester 2016, nitrate was detected in samples collected from wells screened in the Qt-Tnbs₁ North and South HSUs.

In the Qt-Tnbs₁ North HSU, nitrate was detected in three wells during first semester 2016, with the highest concentration at 4.9 mg/L (K6-04) far below the MCL cleanup standard of 45 mg/L and within the range of background. Nitrate was not detected in ground water samples from any other wells completed in the Qt-Tnbs₁ North HSU at concentrations above the MCL cleanup standard or outside the range of nitrate background levels.

In the Qt-Tnbs₁ South HSU, nitrate was detected during first semester 2016, above the 45 mg/L MCL cleanup standard in seven wells, two of which exceeded the nitrate MCL cleanup standard of 45 mg/L including monitor well K6-18 (160 mg/L, January) and K6-23 (94 mg/L, January). The result from K6-23 is consistent with historical nitrate concentrations detected in this well. The 2015 maximum nitrate detection in K6-23 was 110 mg/L. K6-23 is located in close proximity to the Building 899 septic system, which is recognized as a likely source of the nitrate at this location (Dibley et al., 2013). Well K6-18, located approximately 240 ft west-northwest and generally upgradient of K6-23 and the Building 899 septic system, had a January 2015 detection of 233 mg/L but previously had not historically yielded nitrate concentrations exceeding the MCL cleanup standard of 45 mg/L since the 1998 El Niño when nitrate was detected at 78 mg/L. Other wells located in the vicinity of K6-18 have not seen a similar (recent) rise in nitrate concentrations. The source of nitrate recently detected at K6-18 is unknown. This well will be closely monitored to assess whether this detection is representative of nitrate concentrations at this location and the potential source of nitrate detected in this well, including the Building 899 septic system.

Five other wells completed in the Qt-Tnbs₁ South HSU yielded detectable but low nitrate concentrations below the 45 mg/L MCL cleanup standard. Except for the aforementioned wells K6-23 and K6-18, nitrate was not detected in ground water samples from any wells completed in the Qt-Tnbs₁ South HSU at concentrations above the MCL cleanup standard or outside the range of nitrate background levels.

Nitrate has never been detected in the Tnbs₁ Deep HSU above its 45 mg/L MCL cleanup standard. During first semester 2016, nitrate was not detected above the 0.5 mg/L reporting limit, in wells screened in this HSU.

During first semester 2016, nitrate was detected in guard well W-PIT6-1819 at a very low concentration of 0.5 mg/L. Historically, nitrate has not been detected above the 0.5 mg/L reporting limit or at very low concentrations, in this well. During the reporting period, nitrate was not detected in guard wells K6-34, K6-22 or K6-17, above the reporting limit. During first semester 2016, nitrate was detected in inactive water-supply well CARNRW4 (12 mg/L, maximum) far below the MCL cleanup standard of 45 mg/L. During the reporting period, nitrate was not detected above the reporting limit of 0.5 mg/L in water-supply wells CARNRW1 and CARNRW2, and inactive water-supply well CARNRW3.

2.3.2.2. Pit 6 Landfill OU Remediation Optimization Evaluation

The remedy for tritium and VOCs in ground water at the Pit 6 Landfill is Monitored Natural Attenuation (MNA). Ground water levels and contaminants are monitored on a regular basis to: (1) evaluate the efficacy of the natural attenuation in reducing contaminant concentrations, and (2) detect any new chemical releases from the landfill. In general, the primary ground water COCs (VOCs and tritium) at the Pit 6 Landfill OU continue to decline or remain within background and ground water levels beneath the landfill remain approximately 50 ft below the buried waste.

In general, VOCs in ground water near Pit 6 continue to exhibit decreasing trends and the VOC plume areal extent is generally decreasing. Concentrations of the VOC COC chloroform are all below its reporting limit in all Pit 6 wells. Although no longer a COC, cis-1,2-DCE concentrations have remained below its 6 µg/L cleanup standard since 1993. During first semester 2016, TCE concentrations in ground water were below the 5 µg/L MCL cleanup standard in samples from all Pit 6 Landfill OU wells. As recommended in the recent Five-Year Review for OUs 3 and 8 (Buscheck et al., 2013), TCE concentrations will be monitored in well EP6-09 over the next succeeding five years and if concentrations increase or remain above 5 µg/L, remedial measures such as pump-and-treat or enhanced *in situ* bioremediation will be considered for this well. Since the beginning of 2013, TCE concentrations have exceeded the 5 µg/L MCL cleanup standard in EP6-09 only three times, at concentrations of 5.8 µg/L (January 2013), 5.2 µg/L (January 2014) and 5.6 µg/L (July 2015). Total VOCs in this well have exhibited a decreasing trend since the 1990s.

Tritium activities in ground water continue to remain far below the 20,000 pCi/L MCL cleanup standard. During first semester 2016, tritium activities remained low, slightly exceeding the 100 pCi/L reporting limit in wells EP6-07, K6-18, K6-19, K6-33, W-PIT6-1819, CARNRW3, and CARNRW4. These low activities, large analytical uncertainties, and the sporadic nature of tritium detections in wells CARNRW3 and CARNRW4 are likely not indicative of an increasing trend in tritium activity. Accordingly, these results indicate the MNA remedy for tritium at the Pit 6 Landfill OU 3 continues to be effective. Tritium activities will continue to be monitored to determine any future long-term impacts.

Perchlorate concentrations in Pit 6 area ground water have decreased from a maximum of 65 µg/L (following the 1998 El Niño in well K6-19) to below its reporting limit (4 µg/L) in all but two Pit 6 Landfill OU wells (K6-23, 14 µg/L, January and K6-18, 9.2 µg/L, January). Well K6-18 has shown a consistent decreasing perchlorate trend since 1999. Well K6-23 yielded perchlorate for the first time since the well was installed in 1998 and the reason for this recent detection is unknown. The perchlorate trends in wells K6-18 and K6-23 will be evaluated with respect to possible sources or correlation to CARNRW water supply well pumping. Otherwise, perchlorate concentrations have remained below its reporting limit and its 6 µg/L MCL cleanup standard in all Pit 6 wells since March 2009.

Nitrate continues to be consistently detected in Pit 6 well K6-23 above its 45 mg/L MCL cleanup standard. As stated above, well K6-23 is located in close proximity to the Building 899 septic system, which is the likely source of the nitrate at this location. The source of recent nitrate concentrations in well K6-18 above the 45 mg/L MCL cleanup standard is not known but this well may be impacted by the Building 899 septic system believed to be the source of nitrate detected in well K6-23. This well will be closely monitored for nitrate, in the future.

2.3.2.3. Pit 6 Landfill OU Performance Issues

Currently, there is very little contamination above ground water cleanup standards at the Pit 6 Landfill OU. Based on these results, the remedy continues to be effective and protective of human health and the environment, and to make progress toward cleanup.

2.4. High Explosives Process Area (HEPA) OU 4

The HEPA has been used since the 1950s for the chemical formulation, mechanical pressing, and machining of high explosives (HE) compounds into shaped detonation charges. Surface spills from 1958 to 1986 resulted in the release of contaminants at the former Building 815 steam plant. Subsurface contamination is also attributed to HE waste water discharges into former unlined rinse water lagoons. Another minor source of contamination in ground water resulted from leaking contaminated waste stored at the former Building 829 Waste Accumulation Area (WAA) located near Building 829.

Five ground water treatment systems operate in the HEPA: Building 815-Source (815-SRC), Building 815-Proximal (815-PRX), Building 815-Distal Site Boundary (815-DSB), Building 817-Source (817-SRC), and Building 817-Proximal (817-PRX). A sixth ground water treatment system, Building 829-Source (829-SRC), was dismantled in 2013 following approval by the regulatory agencies. As approved, water is still extracted from the same extraction well previously used at 829-SRC, but the water is now collected in a portable tank and transported to the 815-SRC ground water treatment system for treatment. The details of this change were described in a previous CMR report (Dibley et al., 2014). A map of the HEPA OU showing the locations of monitor and extraction wells and treatment facilities is presented on Figure 2.4-1.

The 815-SRC ground water treatment system began operation in September 2000 removing VOCs (primarily TCE), HE compounds (Research Department Explosive [RDX] and High Melting Explosive [HMX]), and perchlorate from ground water. Ground water is extracted from wells W-815-02, W-815-04 and W-815-2803 with a current combined flow rate of approximately 1.3 gpm. The current ground water treatment system configuration includes two ion-exchange resin columns connected in series for perchlorate removal, and three aqueous-phase GAC canisters (also connected in series) for VOC and HE compound removal. The treated effluent is injected into well W-815-1918 for *in situ* denitrification in the Tnbs₂ HSU.

The 815-PRX ground water treatment system began operation in October 2002 removing TCE and perchlorate from ground water. Ground water is extracted from wells W-818-08 and W-818-09 at a current combined flow rate of approximately 2.4 gpm. The current ground water treatment system configuration includes a Cuno® filter to remove particulates, two ion-exchange resin columns connected in series for perchlorate removal, and three aqueous-phase GAC canisters (also connected in series) for TCE removal. The treated effluent is injected into well W-815-2134 where an *in situ* natural denitrification process reduces the nitrate to nitrogen in the Tnbs₂ HSU. This entire extraction and treatment system was rebuilt, and included replacement of the entire pipeline and extraction wellfield components. The extraction wellfield configuration and the methods for treatment remained unchanged.

The 815-DSB ground water treatment system began operation in September 1999 removing low concentrations (less than 10 µg/L) of TCE from ground water extracted near the Site 300 southern boundary. Ground water is extracted from wells W-35C-04, W-6ER and W-815-2608 at a combined flow rate of approximately 3.0 gpm. The current ground water treatment system

configuration includes a Cuno® filter to remove particulates and three aqueous-phase GAC canisters connected in series for TCE removal. The treated effluent is discharged to an infiltration trench.

The 817-SRC ground water treatment system began operation in September 2003 removing HE compounds (RDX and HMX) and perchlorate from ground water. Well W-817-01 extracts ground water from a very low yield portion of the Tnbs₂ aquifer. It pumps ground water intermittently using solar power at current flow rates ranging from 200 to 350 gal per month, averaging approximately 0.01 gpm. The current ground water treatment system configuration includes a Cuno® filter to remove particulates, two ion-exchange resin columns connected in series for perchlorate removal, and three aqueous-phase GAC canisters (also connected in series) for HE compound removal. Treated ground water is injected into upgradient injection well W-817-06A where an *in situ* natural denitrification process reduces the nitrate to nitrogen in the Tnbs₂ HSU.

The 817-PRX ground water treatment system began operation in September 2005 removing VOCs, RDX and perchlorate from ground water. Ground water is currently extracted from wells W-817-03 and W-817-2318 at a combined flow rate of approximately 1.4 gpm, with about 96% from W-817-03. The current ground water treatment system configuration includes a Cuno® filter to remove particulates, two ion-exchange resin columns connected in series for perchlorate removal, and three aqueous-phase GAC canisters (also connected in series) for removal of VOCs and HE compounds. Treated ground water containing nitrate is injected into upgradient injection wells W-817-2109 and W-817-02, where an *in situ* denitrification process reduces the nitrate to nitrogen in the Tnbs₂ HSU.

The 829-SRC ground water treatment system began operation in August 2005 removing VOCs, nitrate and perchlorate from ground water. Currently, ground water is extracted from W-829-06 and transported to, and treated at, the 815-SRC ground water treatment system.

2.4.1. HEPA OU Ground Water Extraction and Treatment System Operations and Monitoring

This section is organized into four subsections: facility performance assessment; operations and maintenance issues; compliance summary; and sampling plan evaluation and modifications.

2.4.1.1. HEPA OU Facility Performance Assessment

The monthly ground water discharge volumes, extraction flow rates, and operational hours during first semester 2016 are summarized in Tables 2.4-1 through 2.4-6. The total volume of ground water extracted and treated and the total contaminant mass removed during the reporting period are presented in Table Summ-1. The total volume of ground water treated and discharged and the total contaminant mass removed are summarized in Table Summ-2. Analytical results for influent and effluent samples collected during first semester 2016 are presented in Tables 2.4-7 through 2.4-9. The pH measurement results are presented in Appendix A.

2.4.1.2. HEPA OU Operations and Maintenance Issues

The following maintenance activities and operational issues occurred at the 815-SRC, 815-PRX, 815-DSB, 817-SRC and 817-PRX ground water treatment system, and the 829-SRC extraction well during first semester 2016:

815-SRC ground water treatment system

- The ground water treatment system was offline until February 8, 2016 for freeze protection.
- The ground water treatment system was offline during the day for power line work in the area from March 14 until March 17, 2016, and was offline for one day (June 21, 2016) to replace an anti-siphon valve.

815-PRX ground water treatment system

- The ground water treatment system was taken offline on August 25, 2015 for the facility upgrade construction (REVAL). The official system restart was initiated on May 3, 2016, but was only operated intermittently until all testing and verification was completed and until both sets of compliance startup samples were collected and evaluated. Full-scale operations began on May 24, 2016.
- The ground water treatment system was offline for one day on June 21, 2016 to conduct a minor pipeline repair.

815-DSB ground water treatment system

- The ground water treatment system operated continuously throughout the reporting period and did not require any maintenance work.

817-SRC ground water treatment system

- The ground water treatment system was shutdown on August 26, 2015 to investigate a high-pressure problem in the re-injection well. The system remained offline and was not restarted until May 23, 2016, with the treated water being collected in a portable bubble tank until 200 gallons was flushed through the system. The flushing was done as a preventative measure in case the methylene chloride problem with the media vessels was still a problem. Operations with reinjection began on June 13, 2016.
- Monthly sampling on June 14, 2016 indicated that methylene chloride was still present in the treatment media vessels, although no methylene chloride was detected in the effluent sample. The system was shut down on June 20, 2016 and a complete GAC change-out performed. The system was immediately restarted.

817-PRX ground water treatment system

- The ground water treatment system was shutdown for freeze protection on November 17, 2015 and remained offline until restart on February 9, 2016.
- The ground water treatment system was shutdown on March 11 after receiving analytical results for effluent samples collected on March 9, 2016 indicated a hit of perchlorate in the effluent sample (details discussed below). The system was restarted on March 21, and additional samples collected on March 22 and again on March 23, 2016.
- The ground water treatment system was shutdown on April 28 and restarted on May 5, 2016 after replacement of a flow meter.

- The ground water treatment system went offline on May 16, 2016 due to low-flow interlock problems and was restarted on May 17, 2016. This system was secured on June 2 after another problem with the facility-flow interlock. Another flow meter was installed and the system restarted on June 8, 2016.
- The ground water treatment system was again shut down on June 9 upon discovery of water leaks between the second and third GAC vessels. It was immediately repaired and put back on-line.

829-SRC Extraction Well

- The ground water extraction system was shutdown on November 17 for freeze protection, and restarted on February 9, 2016.
- The ground water extraction system was shut down for a short period on Jun 6 to transfer the collected ground water to the 815-SRC ground water treatment system for treatment.

2.4.1.3. HEPA OU Compliance Summary

The 815-SRC, 815-PRX, 815-DSB, and 817-SRC ground water treatment systems operated in compliance with the RWQCB Substantive Requirements for Wastewater Discharge.

Perchlorate was detected in the effluent sample collected at 817-PRX on March 9, 2016. An effluent resample as collected on March 11 and the system shut down for evaluation. No perchlorate was detected in the resample above the reporting limit of 4.0 µg/L. The system was restarted on March 21 and two additional effluent perchlorate samples collected on March 22 and March 23, 2016. No perchlorate was detected in either set of samples. Although the analytical laboratory confirmed the original detection of perchlorate, the fact that no perchlorate was detected in the intermediate ion-exchange port sample collected on the same day as the effluent sample in question, and subsequent effluent samples were all non-detect for perchlorate, it is believed that this perchlorate detection must have been from mixed up sample at the laboratory. Thus, it is LLNLs contention that the 817-PRX ground water treatment system also operated in compliance with the RWQCB Substantive Requirements for Wastewater Discharge.

2.4.1.4. HEPA OU Facility Sampling Plan Evaluation and Modifications

The HEPA OU facility sampling and analysis plan complies with the monitoring requirements in the CMP/CP. The sampling and analysis plan is presented in Table 2.4-10. No modifications were made to the plan.

2.4.1.5. HEPA OU Treatment Facility and Extraction Wellfield Modifications

As mentioned briefly, the 815-PRX ground water treatment facility underwent a complete system upgrade (REVAL). All pipelines, media vessels, gauges, electronic systems were replaced with upgraded components. The extraction wellfield did not change, and the treatment system still consists of two ion-exchange resin columns in series for removal of perchlorate, followed by three GAC vessels in series for the removal of VOCs. The treated water is still being re-injected. The biggest change was the combining of the flow from the two extraction wells, W-818-08 and W-818-09, into a single influent pipeline. This was done to allow the system to be operated during cold weather, where now there is sufficient flow in the combined pipeline to prevent the freezing of the water. In the previous system, the two extraction wells

were on individual pipelines and the system was shut down for long periods (months) to prevent freezing of the incoming water and potential rupture of the pipeline leading to a leak of contaminated water. Except for extremely cold conditions, the new system should be able to operate continuously through the winter months. In addition to the single influent pipeline, another major change was the installation of a gravity collection tank at the lowest point of the pipeline. The system is now designed so that in the event of a unscheduled system shut down during freezing conditions, the untreated water in the influent pipeline will gravity drain to a collection tank to prevent freezing of the water in the pipeline.

None of the other three ground water treatment systems had any modifications to the treatment facility or the extraction well field.

2.4.2. HEPA OU Ground Water and Surface Water Monitoring

The sampling and analysis plan for ground water and surface water monitoring is presented in Table 2.4-11. This table also explains deviations from the sampling plan and indicates any additions made to the CMP.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions: a total of 31 required analyses in seven different wells and one spring were not performed because the wells or springs were dry or there was insufficient water for sample collection; a total of 21 required analyses were not performed due to inaccessibility at six different monitor wells (W-810-01, W-823-01, W-823-02, W-823-03, W-823-13, and W-6F); eight required analyses in two different wells were not performed due to inoperable equipment; and eight required analyses in two different extraction wells were not performed as the wells were under construction.

2.4.3. HEPA OU Remediation Progress Analysis

This section is organized into four subsections: mass removal; contaminant concentrations and distribution; remediation optimization evaluation; and performance issues.

2.4.3.1. HEPA OU Mass Removal

The monthly ground water mass removal estimates for first semester 2016 are summarized in Tables 2.4-12 through 2.4-17. The total mass removed during the reporting period and cumulative mass estimates are summarized in Table Summ-1 and Table Summ-2, respectively.

2.4.3.2. HEPA OU Contaminant Concentrations and Distribution

At the HEPA OU, VOCs (mainly TCE) are the primary COCs detected in ground water; RDX, HMX, 4-Amino-2,6-dinitrotoluene (4-ADNT), perchlorate, and nitrate are secondary COCs. Most of the ground water contamination in the HEPA OU occurs in the Tnbs₂ HSU. Some COCs (TCE, RDX, HMX, perchlorate and nitrate) have also been detected in perched ground water of the Tpsg-Tps HSU in the vicinity of Buildings 815 and 817. Minor concentrations of VOCs, perchlorate and nitrate are also present in perched ground water located in the Tnsc_{1b} HSU beneath the former Building 829 WAA. The WAA is located in the northwest portion of HEPA. No contamination has been detected in the Upper and Lower Tnbs₁ HSUs in the HEPA OU. Figure 2.4-1 shows the location of wells in the HEPA OU.

2.4.3.2.1. VOC Concentrations and Distribution

VOC concentrations and distribution in ground water in the Tpsg-Tps, Tnbs₂, and Tnsc_{1b} HSUs in the HE Process Area are discussed below.

Tpsg-Tps HSU

VOCs, primarily TCE, but also 1,1-DCE, chloroform, cis-1,2-DCE, 1,2-DCA and CTET have been detected in the perched water-bearing zones of the Tpsg-Tps HSU. Total VOC concentrations in Tpsg-Tps HSU ground water have decreased from a historic maximum of 450 µg/L (W-815-01, 1992) to a first semester 2016 maximum of 13 µg/L, comprised entirely of TCE, in a April sample collected from 817-PRX extraction well W-817-2318. VOCs remained below the 0.5 µg/L reporting limit in Tpsg-Tps monitor well W-35C-05, located near the southern site boundary. Drought conditions and limited recharge have led to insufficient or no ground water available for sampling in some wells screened in the Tps-Tpsg HSU.

During first semester 2016, VOCs other than TCE were only detected at concentrations above the 0.5 µg/L reporting limit, in monitor wells W-809-01, W-814-01, and W-815-1928. Samples collected in March from well W-809-01 contained chloroform and 1,1-DCE with maximum concentrations of 1.2 µg/L and 1.4 µg/L, respectively; well below their respective MCL cleanup standards. Samples collected in March from W-814-01 contained cis-1,2-DCE, chloroform, and 1,2-DCA with maximum concentrations of 0.91 µg/L, 0.53 µg/L, and 0.81 µg/L, respectively; the maximum 1,2-DCA concentration was slightly above the 0.5 µg/L MCL cleanup standard. Samples collected in March from W-815-1928 contained chloroform at 0.72 µg/L; well below its respective MCL cleanup standard. Similar concentrations of the aforementioned VOCs were detected in Tpsg-Tps wells during 2014.

Tnbs₂ HSU

In the Tnbs₂ HSU, the highest VOC concentrations are found downgradient of Building 815 in the 815-PRX extraction wellfield. Total VOC concentrations in Tnbs₂ HSU ground water have decreased from a historic maximum of 110 µg/L in extraction well W-818-08 (1992) to a first semester 2016 maximum of 31 µg/L (May) in extraction well W-818-08.

During first semester 2016, TCE was detected in the Tnbs₂ HSU with concentrations in 15 wells exceeding the 5 µg/L MCL cleanup standard. The compound 1,1-DCE was detected slightly above the 0.5 µg/L reporting limit in extraction wells W-815-02 and W-815-04 at maximum concentrations of 0.58 µg/L (February) and 0.53 µg/L (April), respectively. Chloroform was detected slightly above the 0.5 µg/L reporting limit in extraction well W-818-08 at 0.51 µg/L. Other VOCs were not detected in the Tnbs₂ HSU during first semester 2016.

VOCs continue to be detected in ground water from the Tnbs₂ HSU at the southern end of Building 832 Canyon. This contamination probably originates from sources located in both the Building 832 Canyon OU and the HEPA OU. Since June 2007, when extraction well W-830-2216 began pumping ground water, total VOC concentrations have steadily decreased from a historic maximum of 20 µg/L in 2007 to a first semester 2016 maximum of 2.8 µg/L (April). A similar decrease in VOC concentrations has been observed in nearby monitor well W-830-13.

During first semester 2016, TCE was detected at concentrations below the 5 µg/L MCL cleanup standard in five samples from Tnbs₂ onsite guard wells W-815-2110 and W-815-2111, located near the Site 300 southern boundary. The maximum TCE concentrations in these

samples were 1.7 µg/L and 1.1 µg/L for W-815-2110 (June) and W-815-2111 (June), respectively. Similar TCE concentrations were detected in these wells in first semester 2015. VOCs were not detected in any other onsite or offsite HEPA Tnbs₂ HSU guard wells during first semester 2016. Sixteen routine and duplicate samples were collected from offsite water-supply well GALLO1 during first semester 2016; VOCs were not detected above the 0.5 µg/L reporting limit in any of these samples.

Overall, total VOC concentrations in the Tnbs₂ HSU remained stable or decreased slightly in first semester 2016. The extent of ground water containing total VOCs concentrations above the 0.5 µg/L reporting limit, 5 µg/L, and 10 µg/L remains similar to first semester 2015.

Tnsc_{1b} HSU

Extraction well W-829-06, screened in the Tnsc_{1b} HSU, contained TCE at concentrations exceeding the 5 µg/L MCL cleanup standard during first semester 2016. Total VOC concentrations in Tnsc_{1b} HSU ground water have decreased from a historic maximum of 1,013 µg/L (W-829-06, 1993) to a first semester 2016 maximum of 27 µg/L, comprised entirely of TCE (February). VOCs have never been detected in ground water from nearby Tnsc_{1b} monitor well W-829-1940 or in nearby monitor wells screened in the Lower Tnbs₁ HSU.

2.4.3.2.2. HE Compound Concentrations and Distribution

During first semester 2016, the HE compounds were detected at concentrations exceeding reporting limits in wells screened in the Tpsg-Tps, Tnsc₂, Tnbs₂, and Tnbs₁ HSUs. In the Tpsg-Tps HSU, HMX and RDX were detected in monitor well W-815-1928 at 9.3 µg/L and 36 µg/L, respectively. In the Tnsc₂ HSU, 1,3-Dinitrobenzene, 2-Amino-4,6-Dinitrotoluene (2-ADNT), 4-Amino-2,6-Dinitrotoluene (4-ADNT), and TNT were detected in monitor well W-6CI at 3.1 µg/L, 8.8 µg/L, 2.9 µg/L, and 9.6 µg/L, respectively. In the Tnbs₁ HSU, 1,3-Dinitrobenzene was detected at 2.2 µg/L in monitor well W-819-02.

In the Tnbs₂, historic maximum concentrations of RDX and HMX of 204 µg/L (1992) and 57 µg/L (1995) detected in 817-SRC extraction well W-817-01 have declined to first semester 2016 maximum concentrations of 44 µg/L (June) and 24 µg/L (June), respectively. 4-ADNT in the Tnbs₂ has declined from a historic maximum of 24 µg/L (1997) detected in 817-SRC extraction well W-817-01 to a first semester 2016 maximum of 2.8 µg/L detected in monitor well W-809-03. HMX concentrations remain significantly below the Regional Tapwater Screening Level of 1,000 µg/L (U.S. EPA, May 2016).

2.4.3.2.3. Perchlorate Concentrations and Distribution

Perchlorate concentrations and distribution in ground water in the Tpsg-Tps, Tnbs₂, and Tnsc_{1b} HSUs in the HE Process Area are discussed below.

Tpsg-Tps HSU

During first semester 2016, samples collected from Tpsg-Tps HSU monitor well W-817-03A and extraction well W-817-2318 contained perchlorate concentrations exceeding the 6 µg/L MCL cleanup standard at 13 µg/L and 11 µg/L, respectively (March). These concentrations represent a slight decrease from the historic maximum perchlorate concentration of 19 µg/L in monitor well W-817-03A.

Tnbs₂ HSU

In the Tnbs₂ HSU, 10 wells yielded ground water with perchlorate concentrations exceeding the 6 µg/L MCL cleanup standard during first semester 2016. Wells with the highest perchlorate concentrations are located in the vicinity of the 817-SRC and 817-PRX treatment facilities. The first semester 2016 maximum perchlorate concentration of 23 µg/L (June) was measured in extraction well W-817-01; well W-817-01 also contained the 50 µg/L historic maximum (1998). Perchlorate has not been detected in any of the Tnbs₂ HSU guard wells or other monitor wells located near the Site 300 southern boundary to date.

Tnsc_{1b} HSU

Perchlorate concentrations in the Tnsc_{1b} HSU have decreased from a historic maximum of 29 µg/L (extraction well W-829-06, 2000) to a first semester 2016 maximum of 10 µg/L (April) in the same well. This was the only Tnsc_{1b} HSU well with perchlorate concentrations exceeding the 6 µg/L MCL cleanup standard and 4 µg/L reporting limit during first semester 2016.

2.4.3.2.4. Nitrate Concentrations and Distribution

Nitrate concentrations and distribution in ground water in the Tpsg-Tps, Tnbs₂, and Tnsc_{1b} HSUs in the HE Process Area are discussed below.

Tpsg-Tps HSU

Nitrate concentrations in Tpsg-Tps HSU ground water have increased from a previous historic maximum of 720 mg/L (2005) in monitor well W-6CS to a first semester 2016 (and new historic) maximum of 790 mg/L (March), in the same well. As there are no known nitrate sources associated with Site 300 operations located near this well, it is possible that a sheep ranch that predates Site 300 discovered in a historic photo of the area may be the source of this localized elevated nitrate. Other wells screened in the Tpsg-Tps HSU had significantly lower nitrate concentrations.

Tnbs₂ HSU

During first semester 2016, nitrate concentrations in ground water collected from the Tnbs₂ HSU ranged from <0.5 mg/L in the vicinity of the Site 300 southern boundary to a maximum of 120 mg/L in monitor well W-817-2609, located near the 817-PRX ground water treatment system. During first semester 2016, nitrate was not detected above the reporting limit in 12 routine and duplicate samples collected from offsite water-supply well GALLO1, and was not detected above the 45 mg/L MCL cleanup standard in ground water from any of the Tnbs₂ HSU guard wells. The first semester 2016 nitrate data from Tnbs₂ HSU wells continue to support the interpretation that nitrate is being degraded *in situ* by natural processes consistent with MNA and nitrate concentrations remain below the 45 mg/L MCL cleanup standard in all wells near the southern site boundary where ground water is present under oxygen depleted, confined conditions.

Tnsc_{1b} HSU

Nitrate concentrations in Tnsc_{1b} HSU ground water have decreased from a historic maximum of 240 mg/L in extraction well W-829-06 to a first semester 2016 maximum of 68 mg/L (April) in the same well. Nitrate concentrations and distribution are similar to that of first semester 2015.

2.4.3.3. HEPA OU Remediation Optimization Evaluation

Remediation at the HEPA OU is managed by balancing ground water extraction at the southern site boundary with upgradient pumping in the source and proximal areas. This strategy is designed to aggressively remediate contaminant source areas while hydraulically capturing the leading edge of the VOC plume near the Site 300 boundary and minimizing the migration of multiple, co-mingled plumes from their respective source areas.

Extraction well W-817-2318 extracts ground water from the Tpsg-Tps HSU in the area of highest VOC and perchlorate concentrations near Spring 5, downgradient of 817-SRC and adjacent to 817-PRX. Although declining water levels due to drought conditions and the low permeability of the HSU have hampered remediation efforts, TCE concentrations in W-817-2318 continue to decline, decreasing to a first semester 2016 maximum of 13 µg/L from a first semester 2015 maximum concentration of 18 µg/L and a 2007 historic maximum of 55 µg/L.

During first semester 2016, 815-PRX extraction wells W-818-08 and W-818-09 continued to exhibit hydraulic capture of ground water with the highest VOC concentrations, and extraction wells W-6ER, W-35C-04, and W-815-2608 continued to capture VOCs along the southern site boundary at the leading edge of the plume.

815-SRC extraction wells W-815-02, W-815-04 and W-815-2803, and 817-SRC extraction well W-817-01 continue to extract ground water from the areas with the highest RDX concentrations. RDX concentrations in W-815-04 have continued to decline since the addition of W-815-2803 to the 815-SRC treatment facility. From 2010 through 2014, W-809-03, located approximately 250 ft northeast of the 815-SRC treatment facility just north of 815-SRC effluent injection well W-815-1918, yielded the maximum concentrations of RDX, when previously, RDX was not detected or detected at concentrations slightly above the reporting limit. The increase in HE compounds observed in W-809-03 is likely due to the hydraulic displacement of HE-bearing ground water in the vicinity of the W-815-1918 injection well. This increase appears to be transient and HE concentrations have generally exhibited a decreasing trend over the last three years. During first semester 2016, 817-SRC extraction well W-817-01 yielded the maximum concentration of RDX.

Perchlorate concentrations in the Tnbs₂ HSU have decreased steadily since monitoring for this COC began in 1998 and the trend continued during first semester 2016 with lower concentrations in the majority of wells with historic perchlorate detections. The areas with the highest perchlorate concentrations continue to be located in the vicinity of the 817-SRC and 817-PRX treatment facilities. Perchlorate concentrations in the confined portions of the Tnbs₂ HSU near the Site 300 southern boundary continue to be near or below the reporting limit; spatial and temporal perchlorate concentration trends suggest perchlorate is being degraded *in situ* by natural processes similar to confirmed nitrate natural attenuation.

Nitrate concentrations in the confined portions of the Tnbs₂ HSU near the Site 300 southern boundary continue to be near or below the reporting limit, demonstrating the continued effectiveness of MNA of nitrate even under pumping conditions.

Throughout the reporting period, pumping from HEPA extraction wells has been effective in capturing COCs and preventing further migration of contaminated ground water towards the Site 300 boundary. During first semester 2016, VOCs were not detected above the reporting limit at offsite water-supply well GALLO1 and VOCs in onsite guard wells W-815-2110 and W-815-2111 remained stable at very low concentrations. Upgradient and downgradient pumping

will continue to be balanced so that hydraulic capture at the Site 300 southern boundary is maintained without accelerating migration from upgradient sources. Close monitoring of VOC concentrations in the southern site boundary area will also continue, especially near offsite water-supply well GALLO1.

The spatial extent of VOCs, perchlorate, and nitrate has slightly increased in the 817-proximal area due to the detection of COCs in recently installed monitor wells W-817-3025 and W-817-3026. At this time, wells W-817-3025 and W-817-3026 will be used as monitor wells instead of injection wells due to the presence of COCs in these wells. Additionally, HE compounds were detected in monitor well W-818-01 and extraction well W-818-09 in the 815-Proximal area, most likely, due to the influence of continued pumping from the 815-PRX extraction wells. The spatial extent of these comingled plumes will be closely monitored and any necessary modifications will be made to extraction wellfield operations to minimize further migration of these plumes toward the Site 300 boundary.

During first semester 2016, the total mass removed from all HEPA treatment facilities included 40 g of VOCs; 21 g of perchlorate; and 41 g of RDX. The volume of treated ground water increased by approximately 4% from 1,351,108 gal (first semester 2015) to 1,409,041 gal (first semester 2016), likely the result of winter recharge events. Compared to first semester 2015, a decrease in VOC mass removed (10%), alongside increases in perchlorate (61%) and RDX (58%) masses removed were observed in first semester 2016. Table Summ-1 lists the mass removed by each individual HEPA treatment facility. Nitrate in the Tnbs₂ HSU undergoes *in situ* biotransformation to benign nitrogen gas by anaerobic-denitrifying bacteria.

Installed in 2014, Tnbs₂ HSU monitor well W-817-3023 was developed in 2015 and was sampled for baseline constituents in first semester 2016. Tps-Tpsg monitor well W-815-3024 has been dry since installation in 2014, and is currently awaiting vapor sampling and baseline constituent sampling at the presence of water. Monitor well W-817-3023 will be sampled routinely starting in second semester 2016.

2.4.3.4. HEPA OU Remedy Performance Issues

There were no new issues that affect the performance of the cleanup remedy for the HEPA OU during this reporting period. The remedy continues to be effective and protective of human health and the environment.

2.5. Building 850/Pit 7 Complex OU 5

High explosive experiments were conducted at the Building 850 Firing Table from the 1950s until 2008. While explosives tests were conducted at Building 850, the firing table was covered with gravel to absorb the shock. The Building 850 Firing Table was routinely rinsed down with water after each experiment to reduce dust. Infiltrating water mobilized chemicals from the contaminated gravel to the underlying bedrock and ground water, however this practice was discontinued in 2004. Until 1989, gravels from the firing table surface were periodically removed and disposed of in several pits in the northwest part of the site.

A Corrective Action Management Unit (CAMU) was constructed in the Building 850 area of OU 5 in 2009 as part of the Building 850 Removal Action. A total of 27,592 cubic yards of polychlorinated biphenyl-, dioxin-, and furan-contaminated soil were excavated from the Building 850 Firing Table area, mixed with Portland cement and water, and consolidated and

compacted to form the CAMU. Additional information on the Building 850 Removal Action is presented in the Building 850 Action Memorandum (Dibley et al., 2008). Design information for the CAMU is presented in the construction subcontractor's 100% design submittal (SCS Engineers, 2009). The inspection and maintenance program for the CAMU program is described in Section 3. A map of the Building 850 area within OU 5 showing the locations of Building 850, the CAMU, and monitor wells is presented on Figure 2.5-1.

An *in situ* bioremediation treatability study for reduction of perchlorate in ground water immediately downgradient of Building 850 commenced in September 2011. A summary of the current status and preliminary results of the treatability study is presented in Section 2.5.2.2. Results indicate that the injection of ethyl lactate has resulted in bacterially-motivated reduction of perchlorate and nitrate in the treatment zone to concentrations below reporting limits.

The Pit 7 Complex area within OU 5 consists of the Pit 3, 4, 5 and 7 Landfills. The Pit 7 Complex landfills were used to dispose of firing table debris and gravel. These pits were constructed by excavating topsoil and alluvial materials to an average depth of 15 to 20 ft (Taffet et al., 1989). The majority of the waste material in the pits derived from the firing tables at Buildings 850 and 851, where aboveground detonations were conducted. The waste placed in the pits included wood, plastic, material, and debris from tent structures, pea gravel, and exploded test assemblies, some of which contained tritium and depleted uranium.

When rainfall increased to above normal levels, such as during El Niño years, the pit waste and underlying bedrock were inundated and residual contamination came into contact with shallow subsurface ground water. Ground water contaminants include tritium, uranium, perchlorate, nitrate and VOCs.

In 1992, an engineered cap was constructed over the Pit 7 Landfill (referred to as the Pit 7 Cap) in compliance with Resource Conservation and Recovery Act (RCRA) requirements. The design included interceptor trenches and surface water drainage channels, a top vegetative layer to prevent erosion, a biotic barrier layer to minimize animal burrowing, and a clay layer of very low permeability to prevent infiltration of precipitation and shallow subsurface interflow that could result in leaching of contaminants. The Pit 7 cap also covers 100% of Pit 4 and approximately 25 to 30% of Pit 3. The original compacted native soil cover on most of Pit 3 and all of Pit 5 remains intact.

The Pit 7 Drainage Diversion System, completed in March 2008, was designed to prevent additional releases of COCs from the pits and underlying bedrock to ground water. There are four components that comprise the drainage diversion system:

1. A subsurface drainage network on the western hillslope.
2. Upgraded riprap at the end of the existing north-flowing concrete channel for the Pit 7 Landfill cap.
3. A vegetated surface water diversion swale along the base of the eastern hillslope, along the paved road (Route 4), including several culverts under Route 4 and dirt fire trails.
4. An upgraded surface water-settling basin at the south end of the existing south-flowing concrete channel for the Pit 7 Landfill cap.

Additional information on the Pit 7 cap and Drainage Diversion System design is presented in the Remedial Design Document for the Pit 7 Complex (Taffet et al., 2008). The detection monitoring, inspection, and maintenance program for the Pit 7 Complex Landfills and the

inspection and maintenance program for the Drainage Diversion System are described in Section 3.

The Pit 7-Source (PIT7-SRC) ground water treatment system began operation in May 2010. Ground water is currently extracted from Quaternary alluvium/Weathered bedrock (Qal/WBR) HSU wells, NC7-64, W-PIT7-2306, W-PIT7-2703, W-PIT7-2704 and W-PIT7-2705; Tnbs₁/Tnbs₀ bedrock HSU wells NC7-25 and W-PIT7-2307; and from well W-PIT7-2305, which is completed in both HSUs. The current ground water treatment system configuration includes three ion-exchange resin canisters to remove uranium followed by three ion-exchange resin canisters containing a perchlorate-selective resin. An additional ion-exchange column for removal of nitrate has been added in series, after the perchlorate removal columns, because the latter became saturated with nitrate and was not effective in removing nitrate. Ground water that has been treated to remove uranium, perchlorate and nitrate is then piped through three aqueous-phase GAC canisters to remove VOCs. The treated water, which still contains tritium, is discharged to an infiltration trench.

A map of the Pit 7 Complex area within OU 5 showing the locations of the landfills, drainage diversion system, extraction and monitor wells, and the treatment system is presented on Figure 2.5-1.

The Building 850 area of OU 5 is discussed in Sections 2.5.1 and 2.5.2. The Pit 7 Complex area of OU 5 is discussed in Sections 2.5.3 through 2.5.5.

2.5.1. Building 850 Area of OU 5 Ground Water Monitoring

The sampling and analysis plan for ground water and surface water monitoring is presented in Table 2.5-1. This table also delineates and explains deviations from the sampling plan.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions: a total of 58 required analyses from twelve different wells and two springs were not performed because the wells/springs were dry or there was insufficient water for sample collection; and four required analyses from monitor well NC7-69 were not performed due to an inoperable pump that prevented sample collection.

2.5.2. Building 850 Area of OU 5 Remediation Progress Analysis

This section is organized into three subsections: analysis of contaminant distribution and concentration trends; remediation optimization evaluation; and performance issues.

2.5.2.1. Building 850 Area of OU 5 Contaminant Concentrations and Distribution

In the Building 850 area of OU 5, tritium and perchlorate are the primary COCs detected in ground water; depleted uranium and nitrate are secondary COCs. These constituents have been identified within the Qal/WBR and Tnbs₁/Tnbs₀ HSUs.

2.5.2.1.1. Tritium Activities and Distribution

For the third consecutive semester, maximum tritium activities in the Building 850 area did not exceed the 20,000 pCi/L MCL cleanup standard. The maximum tritium activities have decreased from a historic maximum of 566,000 pCi/L (monitor well NC7-28, 1985) to a first semester 2016 maximum of 18,400 pCi/L (May) in Qal/WBR HSU monitor well NC7-61.

Tritium activities and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Building 850 Area are discussed below.

Qal/WBR HSU

Tritium activities exceeding the 20,000 pCi/L MCL cleanup standard were not detected in any ground water samples collected from Qal/WBR HSU monitor wells during first semester 2016. The first semester 2016 maximum tritium activity in ground water collected from the Qal/WBR HSU was 18,400 pCi/L from monitor well NC7-61 (May), located approximately 100 ft downgradient (east) of the Building 850 Firing Table. Overall, tritium activities continue to decline in most portions of the Building 850 plume.

Wells W-PIT2-2301 and W-PIT2-2302, located in Elk Ravine downgradient of the Pit 2 Landfill, are monitored to determine the downgradient extent of tritium in the Qal/WBR HSU. Until November 2015, neither well had contained sufficient water for sampling since 2012 when these wells yielded tritium activities within background range (<100 pCi/L). The November 2015 sample collected from W-PIT2-2302 contained 211 pCi/L of tritium, indicating that during periods of high seasonal flow, transport of tritium in the shallow Qal/WBR HSU downgradient of the Pit 2 Landfill does occur. In first semester 2016, W-PIT2-2303 remained sufficiently saturated to be sampled and contained 252 pCi/L of tritium. For the first time since 2012, W-PIT2-2301 contained sufficient water for sample collection in first semester 2016, yielding tritium activities within background range (<100 pCi/L), suggesting tritium transport is limited to the shallow Qal/WBR HSU downgradient of the Pit 2 Landfill.

Beginning in 2013, the extent of tritium exceeding the 20,000 pCi/L MCL cleanup standard began to decrease significantly and now, in first semester 2016, tritium activities in ground water samples from all Qal/WBR wells have dropped below the 20,000 pCi/L MCL cleanup standard. The highest tritium activities are still detected in wells located immediately downgradient of the Building 850 Firing Table (NC7-70, W-850-2417, NC7-61, and NC7-28), but they no longer exceed the 20,000 pCi/L MCL cleanup standard.

Tnbs₁/Tnbs₀ HSU

During first semester 2016, tritium exceeding the 20,000 pCi/L MCL cleanup standard was not detected in any wells screened in the Tnbs₁/Tnbs₀ HSU. The maximum first semester 2016 tritium activity in the Tnbs₁/Tnbs₀ HSU was 7,800 pCi/L (May) in monitor well W-850-2316, located approximately 3,000 ft downgradient (east) of the Building 850 Firing Table. The maximum first semester 2015 tritium activity of 8,040 pCi/L was also detected in a ground water sample from well W-850-2316. The extent of tritium in ground water exceeding 1,000 pCi/L was reduced due to baseline constituent sampling results from recently installed monitor wells W-PIT1-3021 and W-PIT1-3022, located approximately 500 ft southeast of the Pit 1 Landfill. Tritium activities of 205 pCi/L and 852 pCi/L from wells W-PIT1-3021 and W-PIT1-3022, respectively, when plotted on the map, reduced the extent of ground water containing tritium with activities in excess of 1,000 pCi/L in the area east of Landfill Pits 1 and 2. Overall, tritium activities in most Tnbs₁/Tnbs₀ HSU monitor wells are similar to first semester 2015 and the extent of ground water with tritium in excess of background is also similar to previous years.

2.5.2.1.2. Uranium Concentrations and Distribution

During first semester 2016, uranium analyses were performed primarily by alpha spectroscopy with selected samples analyzed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS). High precision uranium isotope data (uranium-235/uranium-238

[$^{235}\text{U}/^{238}\text{U}$] atom ratio) for determining the presence of depleted uranium are only available by ICP-MS analysis. The presence of depleted uranium is indicated by a $^{235}\text{U}/^{238}\text{U}$ atom ratio of less than 0.007. Historic uranium isotope data indicate that regions of ground water containing some added depleted uranium extend downgradient about 1,200 ft within the Qal/WBR HSU, and 700 ft within the Tnbs₁/Tnbs₀ HSU, from the Building 850 Firing Table and have remained relatively stable. Uranium activities and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Building 850 Area are discussed below.

Qal/WBR HSU

During first semester 2016, total uranium activities exceeding the 20 pCi/L MCL cleanup standard were not detected in any Qal/WBR HSU wells in the Building 850 area. The maximum first semester 2016 total uranium activity, measured in monitor well NC7-28, was 7.7 pCi/L (May), a decrease from the first semester 2015 maximum activity of 14 pCi/L measured in ethyl lactate injection well W-850-2417. The historic maximum for the Building 850 area is 24 pCi/L (January 2013) in well NC7-28. Both wells W-850-2417 and NC7-28 are located within the *in situ* bioremediation treatment zone immediately downgradient of the Building 850 Firing Table. Overall, uranium activities remain similar to previous years in the Qal/WBR HSU wells within the Building 850 area, with the exception of those located within the *in situ* bioremediation treatment zone, including the two wells previously mentioned and NC7-70. Prior to ethyl lactate injection, which began in September 2011, the maximum uranium activity in the three wells was 9.8 pCi/L in the July 2011 ground water sample collected from well NC7-28. After ethyl lactate injection and related ground water extraction and injection operations began (see Section 2.5.2.3 for details on the treatability study), uranium activities in these wells have ranged from below the reporting limits (0.1 pCi/L and 0.063 pCi/L for alpha spectroscopy and mass spectroscopy, respectively) to 24 pCi/L. Injection of ethyl lactate lowers the pH of the ground water and creates reducing conditions. Short-term decreases in total uranium activity in ground water are a product of reducing conditions that lower uranium solubility. Uranium activities can rebound in excess of pre-injection activities when the treatment zone is recharged by oxygenated ground water and slightly sub-neutral pH that increases uranium solubility and mobilizes depleted and/or natural uranium sorbed/precipitated onto aquifer mineral surfaces.

Tnbs₁/Tnbs₀ HSU

Similar to first semester 2015, only one well screened in the Tnbs₁/Tnbs₀ HSU contained ground water with a total uranium activity exceeding the 20 pCi/L MCL cleanup standard in first semester 2016. The total uranium activity in the May sample collected from monitor well W-850-2315 was 24 pCi/L, equaling the historic maximum uranium activity for Tnbs₁/Tnbs₀ HSU wells in the Building 850 area measured in the same well in 2014. ICP-MS results of all water samples from this well have indicated natural uranium atom ratios. W-850-2315 is located approximately 1,400 ft southeast (cross-gradient) of Building 850.

2.5.2.1.3. Nitrate Concentrations and Distribution

Nitrate was detected at concentrations at or above the 45 mg/L MCL cleanup standard in 10 wells in the Building 850 area during first semester 2016. Nitrate concentrations and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Building 850 Area are discussed below.

Qal/WBR HSU

During first semester 2016, the maximum nitrate concentration measured in a Qal/WBR HSU well was 56 mg/L (April) from monitor well NC7-11, located in the vicinity of the Building 850 Firing Table. The maximum historic nitrate concentration for ground water collected from a Qal/WBR HSU well in the Building 850 area is 186 mg/L from monitor well K2-04S (1993). In the vicinity of the Building 850 Firing Table, three additional wells contained ground water with nitrate concentrations that exceeded the 45 mg/L MCL cleanup standard. Monitor well NC7-44, located upgradient of the firing table and the *in situ* bioremediation treatment zone, contained 53 mg/L of nitrate, and monitor wells NC7-10 and NC7-61, located downgradient of the firing table and the *in situ* bioremediation treatment zone, contained 52 mg/L and 48 mg/L of nitrate, respectively. Nitrate concentrations in wells NC7-28, NC7-70 and W-850-2417, located within the *in situ* bioremediation treatment zone, remained below the 0.5 mg/L reporting limit during 2014, rose above the reporting limit during rebound monitoring in 2015, and exceeded the 45 mg/L MCL cleanup standard for the first time since bioremediation treatment began, during first semester 2016 in well W-850-2147 at 47 mg/L. Nitrate concentrations within the *in situ* bioremediation treatment zone are microbially denitrified due to biostimulation via ethyl lactate injection and re-circulation in wells W-850-2417 and NC7-70 (see Section 2.5.2.3 for details on the treatability study).

Tnbs₁/Tnbs₀ HSU

The first semester 2016 maximum nitrate concentration in the Building 850 area was 180 mg/L (April) in monitor well NC7-29, located southeast and cross-gradient of Building 850. The historic local maximum nitrate concentration was 190 mg/L (2013) in the same well. The other Tnbs₁/Tnbs₀ HSU wells with nitrate concentrations exceeding the 45 mg/L MCL cleanup standard are located southeast of the Pit 2 Landfill (NC2-12S), east of the Pit 1 Landfill (W-PIT1-2209 and W-PIT1-2620), and north of the Pit 1 Landfill (W-865-2121).

Historic data indicate that ground water nitrate concentrations in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs are limited in extent and relatively stable. Overall, except for the *in situ* bioremediation treatment zone, the distribution and concentrations of nitrate in ground water are generally consistent, or have declined slightly from those observed in previous years.

2.5.2.1.4. Perchlorate Concentrations and Distribution

During first semester 2016, perchlorate concentrations exceeding the 6 µg/L MCL cleanup standard were detected in 17 wells located east and south (downgradient) of Building 850, east (downgradient) of Pit 1, and southeast of Pit 2 in Elk Ravine. Perchlorate concentrations are similar to or have decreased slightly from first semester 2015. The highest perchlorate concentrations in the Building 850 area are found in wells located downgradient of the Building 850 Firing Table. Perchlorate concentrations and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Building 850 Area are discussed below.

Qal/WBR HSU

Ground water in the Qal/WBR HSU that contains perchlorate with concentrations in excess of the 6 µg/L MCL cleanup standard extends approximately 2,200 ft downgradient of the Building 850 Firing Table, similar to previous years. Perchlorate concentrations in Qal/WBR HSU ground water in the Building 850 area have decreased from a historic maximum of 92 µg/L in monitor well NC7-28 (October 2008) to the first semester 2016 maximum concentration of 39 µg/L (March) in ethyl lactate injection well W-850-2417. Located approximately 225, 250,

and 500 ft east (downgradient) of the firing table, respectively, wells W-850-2417 and NC7-28 are located within the *in situ* bioremediation treatment zone, and performance monitor well NC7-61 is directly downgradient of the treatment zone. Biostimulation via ethyl lactate injections between October 2011 and June 2015 in wells NC7-70 and W-850-2417 have resulted in microbial reduction of perchlorate in the treatment zone to levels mostly below the 4 µg/L reporting limit. During 2014, perchlorate concentrations in wells located within the treatment zone were all below the reporting limit, with the exception of NC7-28 (4.3 µg/L, May). In 2015, perchlorate concentrations within the treatment zone increased during rebound monitoring; maximum perchlorate concentrations measured during first semester 2016 were <4 µg/L, 39 µg/L, and 17 µg/L for NC7-70, W-850-2417, and NC7-28, respectively. While perchlorate concentrations rebounded during 2015 they remain considerably lower than the pre-ethyl lactate injection perchlorate concentrations of 32 µg/L, 74 µg/L and 61 µg/L for wells NC7-70, W-850-2417, and NC7-28, respectively. A complete analysis of the perchlorate *in situ* bioremediation treatment study will be presented in the Building 850 Focused Remedial Investigation/ Feasibility Study (RI/FS) report.

Prior to September 2011 when ethyl lactate injection began, perchlorate concentrations in NC7-44, located west (outside) of the *in situ* bioremediation treatment zone approximately 400 ft upgradient of well NC7-70, had not been detected above the 4 µg/L reporting limit. During 2015, perchlorate concentrations of 7.4 µg/L and 8.8 µg/L were reported by two different analytical laboratories and a subsequent sample collected in December 2015 yielded 4.8 µg/L of perchlorate. During first semester 2016, perchlorate was detected in NC7-44 at 9.5 µg/L, exceeding the 6 µg/L MCL cleanup standard. Given the distance upgradient from the treatment zone and the relatively small volumes of ground water involved, it is uncertain whether injection into NC7-70 could hydraulically influence perchlorate distribution in the Building 850 source area causing an increase in perchlorate concentrations in well NC7-44 (similar increases in other COCs were not observed).

Tnbs₁/Tnbs₀ HSU

Perchlorate concentrations in *Tnbs₁/Tnbs₀* HSU ground water in the Building 850 area have decreased from a historic maximum of 30 µg/L in monitor well NC7-29 (May 2011) to a first semester 2016 maximum perchlorate concentration of 11 µg/L in NC7-27 (April). Located approximately 900 ft east (downgradient) of the Building 850 Firing Table, NC7-27 also contained the first semester 2015 perchlorate maximum of 10 µg/L. Other *Tnbs₁/Tnbs₀* HSU wells containing ground water with perchlorate concentrations exceeding the 6 µg/L MCL cleanup standard during first semester 2016 are located east of the Building 850 Firing Table (NC7-43, NC2-18, and W-850-2145), south of the Building 850 Firing Table (NC7-29), and southeast of the Pit 2 Landfill (NC2-17).

Perchlorate concentrations in wells K1-02B and W-PIT1-2326, located east of the Pit 1 Landfill, remained below the 6 µg/L MCL cleanup standard for a second consecutive semester at concentrations of 4.9 µg/L and 5.7 µg/L, respectively. Additionally, perchlorate was not detected above the reporting limit during first semester 2016 in newly installed monitor wells W-PIT1-3021 and W-PIT1-3022. The current extent of perchlorate exceeding the 6 µg/L MCL cleanup standard in ground water east of the Elk Ravine fault is limited to a single monitor well located southeast of the Pit 2 Landfill, NC2-17.

2.5.2.1.5. HE Compound Concentrations and Distribution

During first semester 2016, ground water samples from 20 wells located in the vicinity of Building 850 or downgradient of the Building 850 Firing Table were analyzed for HE compounds at a reporting limit, generally, of 2 µg/L. Only HMX and RDX were detected at concentrations exceeding the reporting limits. The source of HMX and RDX is the Building 850 Firing Table. HE compound concentrations and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Building 850 Area are discussed below.

Qal/WBR HSU

During first semester 2016, samples collected from wells NC7-10, NC7-11, NC7-61, and W-850-2417 contained RDX at concentrations that exceeded the 1 µg/L cleanup standard. The maximum RDX concentration of 6 µg/L (May) is a slight increase from the first semester 2015 maximum of 4.7 µg/L detected the same monitor well, NC7-61. Following ethyl lactate injection into well W-850-2417 during 2011, RDX concentrations in W-850-2417 and well NC7-28, located immediately downgradient of W-850-2417, have been mostly below the reporting limit. Biodegradation of RDX is known to occur under anaerobic conditions and may explain the decrease of RDX concentrations within the treatment zone. Evidence of RDX concentration rebounding was observed in 2015 when both samples (June and December) collected from W-850-2417 exceeded the reporting limit; however, in first semester 2016, RDX was not detected in W-850-2417. RDX concentrations in NC7-28 remain below the reporting limit.

During first semester 2016, wells NC7-10, NC7-11, NC7-28, and NC7-61, all located downgradient of the Building 850 Firing Table, yielded HMX at concentrations above the reporting limit with the maximum of 16 µg/L (May) detected in monitor well NC7-28. HMX concentrations in the Qal/WBR HSU are significantly below the HMX Regional Tapwater Screening Level of 1,000 µg/L (U.S. EPA, May 2016).

During first semester 2016, the extent of HE compounds in Building 850 ground water was limited to five wells within 900 ft east (downgradient) of the Building 850 Firing Table.

Tnbs₁/Tnbs₀ HSU

During first semester 2016, HE compounds were not detected above the reporting limit, in ground water from wells screened in the Tnbs₁/Tnbs₀ HSU downgradient of Building 850 or from wells screened in the underlying Tnsc₀ HSU.

2.5.2.2. Building 850 Area of OU 5 Remediation Optimization Evaluation

Data collected during the reporting period indicate that natural attenuation (dispersion, radioactive decay, and a decreasing source term) has been effective in reducing all tritium activities in ground water to below the 20,000 pCi/L MCL cleanup standard. The highest tritium activities in ground water continue to be located directly downgradient of the tritium sources at the Building 850 Firing Table and continue to decline. In general, the footprint of the ground water tritium plume remains stable and activities continue to decline and are significantly below historic highs throughout the Building 850 plume. The leading edge of the tritium plume is stable, within the Site 300 interior, and is expected to completely attenuate within the boundaries of Site 300.

During first semester 2016, only one well in the Building 850 area, located approximately 1,400 ft southeast (cross-gradient) of Building 850, contained ground water with total uranium activities that exceeded the 20 pCi/L MCL cleanup standard. The monitoring-only strategy for uranium at Building 850 continues to be protective given that: (1) total uranium activities in ground water at and downgradient from Building 850 are below the 20 pCi/L MCL cleanup standard, and (2) the areal extent of depleted uranium has not changed during the period of monitoring. Temporal trends in $^{235}\text{U}/^{238}\text{U}$ isotope ratios from past samples have remained stable.

West of the Elk Ravine fault, the overall extent and maximum concentrations of nitrate and perchlorate in ground water during first semester 2016 are similar to those observed in first semester 2015. East of the Elk Ravine fault, the extent of perchlorate concentrations above the 6 MCL cleanup standard have been reduced from three small plumes (downgradient of the Pit 1 Landfill, vicinity of NC2-12, and vicinity of NC2-17) to the vicinity of a single well, NC2-17. Within the *in situ* perchlorate bioremediation treatment zone, perchlorate and nitrate concentrations in ground water samples from wells NC7-28, NC7-70 and W-850-2417 during first semester 2016 are either below reporting limits or significantly lower than pre-injection concentrations.

2.5.2.3. Building 850 Area of OU 5 Enhanced Bioremediation Treatability Study

The *in situ* perchlorate bioremediation treatability study commenced at Building 850 during second semester 2011. The objective of this study is to evaluate the efficacy of *in situ* enhanced bioremediation methods in reducing perchlorate concentrations in Building 850 ground water. To date, the test has consisted of injecting ethyl lactate mixed with ground water in wells W-850-2417 (ethyl lactate injections in 2011 and 2012) and NC7-70 (ethyl lactate injections in 2013 and 2015) to facilitate the *in situ* bioremediation of perchlorate by indigenous bacteria, while monitoring these and nearby wells NC7-28 and W-850-2416 to evaluate bioremediation performance.

Monitoring results indicate that perchlorate concentrations in wells W-850-2417 and NC7-28 were microbially reduced from pre-test 2011 maxima of 74 $\mu\text{g}/\text{L}$ and 71 $\mu\text{g}/\text{L}$, respectively, to below the 4 $\mu\text{g}/\text{L}$ reporting limit by 2012. Perchlorate concentrations remained below the reporting limit in almost all samples collected from these wells during 2013 and 2014. During 2015 rebound monitoring, perchlorate concentrations within the treatment zone exhibited an increasing trend and the final perchlorate concentrations measured during first semester 2016 were <4 $\mu\text{g}/\text{L}$, 26 $\mu\text{g}/\text{L}$, and 16 $\mu\text{g}/\text{L}$ for NC7-70, W-850-2417, and NC7-28, respectively. While perchlorate concentrations increased during 2015 and 2016 they remain considerably lower than the pre-ethyl lactate injection perchlorate concentrations of 32 $\mu\text{g}/\text{L}$, 74 $\mu\text{g}/\text{L}$ and 61 $\mu\text{g}/\text{L}$ for wells NC7-70, W-850-2417, and NC7-28, respectively.

Although not specifically targeted for bioremediation, nitrate concentrations and uranium activities were also monitored in the injection wells W-850-2417 and NC7-70, and performance monitor well NC7-28. Nitrate concentrations in wells W-850-2417, NC7-70 and NC7-28 decreased from pre-injection maximum concentrations of 52 mg/L, 32 mg/L, and 57 mg/L, respectively, to below the 0.5 mg/L reporting limit following ethyl lactate injection. During first semester 2016, nitrate concentrations in W-850-2417 and NC7-28 had rebounded and were greater than the reporting limit, but below pre-injection concentrations and the 45 mg/L MCL cleanup standard at 27 mg/L and 22 mg/L for W-850-2417 and NC7-28, respectively. Nitrate remained below the reporting limit in NC7-70 during first semester 2016.

Total uranium activities in W-850-2417, NC7-28 and NC7-70 initially decreased following ethyl lactate injection but fluctuated with activities often exceeding the pre-injection values. In the case of well NC7-28, activity increased from a pre-injection value of 9.8 pCi/L to 24 pCi/L (January 2013). The first semester 2016 uranium activities in wells W-850-2417, NC7-28, and NC7-70 were below pre-injection values at 2.1 pCi/L, 7.7 pCi/L, and 1.3 pCi/L, respectively. Following ethyl lactate injection, decreasing uranium activities appear to result from concurrent reduction of U^{+6} species in ground water to U^{+4} species, which form insoluble mineral solids. Later increases likely arise from a combination of dissolution of natural U under low pH conditions and oxidation of reduced uranium from solids on mineral surfaces back into solution, coupled with arrival of pre-existing dissolved uranium from upgradient of the treatment area.

In March 2013, fluorescein, a non-toxic tracer, mixed with ground water was injected into NC7-70 to independently track the migration of injected fluids along the flow path from well NC7-70 downgradient through the treatment zone to wells W-850-2417 and NC7-28. Tracer was first detected in the December 4, 2013 ground water sample from well W-850-2417 followed by detection in well NC7-28 during first semester 2014. Monitoring of the tracer test continued during first semester 2016.

A complete analysis of the *in situ* perchlorate bioremediation treatability study and the tracer test will be presented in the Building 850 Focused Feasibility Study report.

2.5.2.4. Building 850 Area of OU 5 Remedy Performance Issues

There were no new issues that affect the performance of the MNA cleanup remedy for tritium in the Building 850 area during this reporting period. The remedy for tritium continues to be effective and protective of human health and the environment, and tritium activities, now below the 20,000 pCi/L MCL cleanup standard for three consecutive semesters, continue to decline. Perchlorate, uranium and RDX distribution in ground water downgradient of the Building 850 Firing Table will continue to be closely monitored and reported. The *in situ* bioremediation treatability study analytical results will be evaluated in the Building 850 Focused Feasibility Study report. The performance of this technology with respect to uranium and RDX remediation or stabilization will also be evaluated.

2.5.3. Pit 7 Complex Area of OU 5 Ground Water Treatment System Operations and Monitoring

This section is organized into five subsections: facility performance assessment; operations and maintenance issues; compliance summary; facility sampling plan evaluation and modifications; and treatment facility and extraction wellfield modifications.

2.5.3.1. Pit 7 Complex Area of OU 5 Facility Performance Assessment

The monthly ground water discharge volumes and rates and operational hours for first semester 2016 are summarized in Table 2.5-2. The total volume of ground water extracted and treated, and masses removed during the reporting period are presented in Table Summ-1. The cumulative volume of ground water treated and discharged and masses removed are summarized in Table Summ-2. Analytical results for influent and effluent samples collected during first semester 2016 are presented in Tables 2.5-3 through 2.5-6. The pH measurement results are presented in Appendix A.

2.5.3.2. Pit 7 Complex Area of OU 5 Operations and Maintenance Issues

The PIT7-SRC ground water treatment system operated continuously during first semester 2016, with the exception of periods of shut down to certain extraction wells to allow them to recover to facilitate collection of quarterly samples.

2.5.3.3. Pit 7 Complex Area of OU 5 Compliance Summary

The PIT7-SRC ground water treatment system operated within compliance with the RWQCB Substantive Requirements for Wastewater Discharge throughout the reporting period.

2.5.3.4. Pit 7 Complex Area of OU 5 Facility Sampling Plan Evaluation and Modifications

The PIT7-SRC treatment facility sampling and analysis plan complies with the monitoring requirements in the CMP/CP. The treatment facility sampling and analysis plan is presented in Table 2.5-7. No modifications to the plan were made during this reporting period.

2.5.3.5. Pit 7 Complex Area of OU 5 Treatment Facility and Extraction Wellfield Modifications

No treatment facility or extraction wellfield modifications were made during this reporting period.

2.5.4. Pit 7 Complex Area of OU 5 Ground Water Monitoring

The sampling and analysis plan for ground water and surface water monitoring is presented in Table 2.5-8. This table also delineates and explains deviations from the sampling plan.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions: a total of 46 required analyses in eleven different wells were not performed because the wells were dry or there was insufficient water for sample collection; a total of three required analyses were not performed as monitor well W-865-1804 was inaccessible due to muddy conditions.

2.5.5. Pit 7 Complex Area of OU 5 Remediation Progress Analysis

This section is organized into three subsections: analysis of contaminant distribution and concentration trends; remediation optimization evaluation; and performance issues.

2.5.5.1. Pit 7 Complex Area of OU 5 Mass Removal

The monthly ground water mass removal estimates for first semester 2016 are summarized in Table 2.5-9. The total mass removed during the reporting period and cumulative mass estimates are summarized in Table Summ-1 and Table Summ-2, respectively.

2.5.5.2. Pit 7 Complex Area of OU 5 Contaminant Concentrations and Distribution

In the Pit 7 Complex area of OU 5, tritium is the primary COC in ground water, and uranium, perchlorate, nitrate, and VOCs are secondary COCs. These constituents have been identified within the Qal/WBR and Tnbs₁/Tnbs₀ HSUs. The locations of the wells discussed in the following text appear on the Building 850 and Pit 7 Complex area site map (Figure 2.5-1).

2.5.5.2.1. Tritium Activities and Distribution

Commingle plumes of tritium in ground water extend from Pit 3 and Pit 5 Landfill sources. The Pit 7 Landfill is not an apparent source of tritium to ground water as most of the tritium-bearing experiments at Site 300 were conducted prior to its opening in 1979 (Taffet et al., 2008) and monitor well NC7-48, located directly downgradient of Pit 7 and upgradient of Pit 3, has generally yielded ground water samples that contain tritium activities within background ranges. Tritium activities in the ground water samples collected from well NC7-48 during first semester 2016 were just above the 100 pCi/L reporting limit for tritium at 132 pCi/L (April). Tritium activities and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Pit 7 Complex Area are discussed below.

Qal/WBR HSU

Tritium activities in the Qal/WBR HSU ground water in the Pit 7 Complex area have decreased from a historic maximum of 2,660,000 pCi/L (NC7-63, 1998) to a first semester 2016 maximum activity of 281,000 pCi/L in monitor well NC7-63 (April). The first semester 2015 maximum tritium activities of 173,000 pCi/L was detected in samples collected from well NC7-51, located about 40 ft northeast of Pit 5 and 60 ft east of Pit 3. In the Qal/WBR HSU, the region of ground water containing tritium in excess of the MCL cleanup standard extends about 1,600 ft southeast from the eastern edge of Pit 3. During first semester 2016, ground water tritium activities and the extent of tritium activities exceeding the 20,000 pCi/L MCL cleanup standard remain similar to those observed in first semester 2015.

Tnbs₁/Tnbs₀ HSU

In the Pit 7 Complex area, tritium activities in Tnbs₁/Tnbs₀ HSU ground water have decreased from a historic maximum of 770,000 pCi/L (1999) to a first semester 2016 maximum of 162,000 pCi/L (May). Both the historic and first semester 2015 maximum tritium activities were detected in samples from extraction well NC7-25, located about 250 ft downgradient (northeast) of the Pit 3 Landfill. Within the Pit 7 Complex area, ground water in the Tnbs₁/Tnbs₀ HSU with tritium activities in excess of the 20,000 pCi/L MCL cleanup standard extends about 800 ft northeast of Pit 3 and Pit 5, similar to that observed in first semester 2015. In general, tritium activities in the Tnbs₁/Tnbs₀ HSU are similar or have declined slightly compared to 2015 detections.

Overall, the extent of tritium in ground water with activities in excess of the 100 pCi/L background level remains stable, and is similar to that observed in first semester 2015.

2.5.5.2.2. Uranium Concentrations and Distribution

Uranium activities and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Pit 7 Complex Area are discussed below.

Qal/WBR HSU

Uranium activities in Qal/WBR HSU ground water in the Pit 7 Complex area have decreased from a historic maximum of 781 pCi/L (monitor well NC7-40, 1998) to a first semester 2016 maximum of 127 pCi/L in extraction well NC7-64 (April); a slight increase from the 2015 maximum of 116 pCi/L detected in the same well. NC7-64 is located directly downgradient (east) of Pit 3. Total uranium activities exceeded the 20 pCi/L MCL cleanup standard in 15 wells in the Qal/WBR HSU during first semester 2016.

All of the wells with uranium activities exceeding the 20 pCi/L MCL cleanup standard are proximal to the landfills and have historically shown $^{235}\text{U}/^{238}\text{U}$ isotopic ratios indicating some depleted uranium. The extent of uranium in excess of the MCL cleanup standard in the Qal/WBR HSU is confined to an area directly east of Pit 3 and another area that extends about 500 ft southeast from the center of Pit 5. The spatial extent of shallow ground water impacted with depleted uranium has been stable since the mid-1990s. Areas of depleted uranium in ground water are bounded by wells that exhibit $^{235}\text{U}/^{238}\text{U}$ atom ratios indicative of natural uranium. Sorption and ion-exchange are likely responsible for retarding the migration of depleted uranium in ground water compared to conservative contaminants such as tritium.

Tnbs₁/Tnbs₀ HSU

In the Pit 7 Complex Area, only one well screened in the Tnbs₁/Tnbs₀ HSU contained ground water with a total uranium activity in excess of the 20 pCi/L MCL cleanup standard during first semester 2016. Ground water samples collected in March and May from extraction well NC7-25, located downgradient (east) of Pit 3, ranged between 30 pCi/L and 52 pCi/L, a decrease from October 2014 when the total uranium activity was 100 pCi/L (the historic maximum for the Tnbs₁/Tnbs₀ HSU in the Pit 7 Complex Area). Well NC7-25 is the only Tnbs₁/Tnbs₀ HSU well that historically and currently yields ground water with uranium in excess of the MCL cleanup standard. Prior to October 2014, uranium activity in NC7-25 had not exceeded 51 pCi/L (October 1998) and all $^{235}\text{U}/^{238}\text{U}$ atom ratio data indicated that the uranium was natural. In October 2014, two years after ground water extraction from well NC7-25 began in August 2012, the ground water uranium activity increased significantly to 100 pCi/L and the measured $^{235}\text{U}/^{238}\text{U}$ atom ratio was 0.0066, indicating for the first time a minor but quantifiable presence of depleted uranium in ground water from this well. The presence of depleted uranium suggested that migration of Qal/WBR water into the well's capture zone may have occurred. The uranium activity remained elevated in the ground water sample collected in April 2015 (83 pCi/L, no isotope ratio data available). During most of October and the entire month of November, the PIT7-SRC ground water treatment system was offline due to temperature interlock and compressor problems. The system was restarted on December 1 and ground water samples were collected from the extraction wells. The uranium activity in the ground water sample collected from well NC7-25 in December had decreased to 34 pCi/L with a natural isotopic ratio (0.0071). It appears that after two years of ground water extraction from well NC7-25, Qal/WBR water with higher uranium activity and a small component of depleted uranium had migrated into the capture zone and been extracted. During an almost two-month period of inactivity, recovery to static water level was provided by natural uranium-bearing water of lower activity. In first semester 2016, uranium activities were a mix of elevated and natural activities, ranging between 30 pCi/L (May) and 52 pCi/L (March) with a range of isotopic ratios between 0.00694 and 0.00727.

The maximum uranium activity in a well screened in both the Qal/WBR and Tnbs₁/Tnbs₀ HSUs during first semester 2016 was 26 pCi/L (June) in extraction well W-PIT7-2307.

As is the case for the Building 850 portion of OU 5, uranium activity analyses for first semester 2016 were performed primarily by alpha spectroscopy with selected samples analyzed by ICP-MS.

2.5.5.2.3. Nitrate Concentrations and Distribution

Nitrate concentrations and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Pit 7 Complex Area are discussed below.

Qal/WBR HSU

During first semester 2016, ground water in four Qal/WBR HSU wells contained nitrate with concentrations at or above the 45 mg/L MCL cleanup standard. Nitrate concentrations in the Qal/WBR HSU have decreased from the historic maximum of 90 mg/L in well NC7-63 (2011) to a first semester 2016 maximum of 60 mg/L (April) in monitor well NC7-63. Well NC7-63, dry during first semester 2015, is located immediately downgradient (east) of Pit 3.

Tnbs₁/Tnbs₀ HSU

During first semester 2016, nitrate was detected at concentrations at or above the 45 mg/L MCL cleanup standard in samples from Tnbs₁/Tnbs₀ HSU wells NC7-47 and W-PIT7-13, both located downgradient and northeast of the Pit 7 Complex area. The first semester 2016 maximum nitrate concentration was 65 mg/L in well NC7-47 (May). Well NC7-47 is also the location of the historic maximum nitrate concentration of 85 mg/L (2003). Ground water collected from monitor well W-PIT7-13 contained 65 mg/L and 53 mg/L, for the routine and duplicates samples, respectively, in April.

The first semester 2016 maximum nitrate concentration in a well screened in both the Qal/WBR and Tnbs₁/Tnbs₀ HSUs was 56 mg/L in monitor well K7-01, located immediately downgradient of Pit 5.

Historic data indicate that nitrate concentrations in the Qal/WBR and Tnbs₁/Tnbs₀ HSU ground water are limited in extent and relatively stable. The distribution and concentrations of nitrate in ground water during first semester 2016 are similar to what was observed in first semester 2015.

2.5.5.2.4. Perchlorate Concentrations and Distribution

During first semester 2016, perchlorate was detected at concentrations exceeding the 6 µg/L MCL cleanup standard in 13 wells downgradient (east) of the landfills. Perchlorate concentrations and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Pit 7 Complex Area are discussed below.

Qal/WBR HSU

Perchlorate concentrations in Qal/WBR HSU ground water in the Pit 7 Complex area have decreased from a historic maximum of 40 µg/L (extraction well W-PIT7-2306, 2009) to a first semester 2016 maximum of 14 µg/L (April) in monitor well NC7-34, located immediately upgradient of Pit 5. Well W-PIT7-2306 has not contained sufficient water for sampling since May 2012. The other Qal/WBR HSU wells with perchlorate exceeding the 6 µg/L MCL cleanup standard during first semester 2016 were monitor well NC7-51 and extraction wells NC7-64 and W-PIT7-2703, located immediately downgradient of Pit 3, and monitor wells NC7-40, W-PIT7-03, and W-PIT7-1918, and extraction wells W-PIT7-2305 and W-PIT7-2705, located immediately downgradient of Pit 5.

Tnbs₁/Tnbs₀ HSU

Perchlorate concentrations in Tnbs₁/Tnbs₀ HSU ground water have decreased from a historic maximum of 29 µg/L in monitor well K7-03 (2005) to the first semester 2016 maximum

concentration of 11 µg/L in monitor well NC7-68 (April). During first semester 2016, extraction wells NC7-25 and W-PIT7-2307 also contained perchlorate at concentrations exceeding the 6 µg/L MCL cleanup standard. Well NC7-25 is located downgradient of Pit 3, and wells NC7-68 and W-PIT7-2307 are located downgradient of Pit 5.

The first semester 2016 maximum perchlorate concentration in a well screened in both the Qal/WBR and Tnbs₁/Tnbs₀ HSUs was 7.9 µg/L in monitor well K7-01 (April). Well K7-01 is located immediately downgradient of Pit 5.

Overall, the extent of perchlorate at concentrations exceeding the 6 µg/L MCL cleanup standard in the Pit 7 Complex area ground water did not change significantly from first semester 2015 to first semester 2016.

2.5.5.2.5. VOC Concentrations and Distribution

The VOC COCs in Pit 7 Complex Area ground water include TCE and 1,1-DCE. Only TCE was detected in ground water samples from three Pit 7 Complex area wells during first semester 2016. Concentrations were below the TCE 5 µg/L MCL cleanup standard in all of the wells and have been so since 2011. VOC concentrations and distribution in ground water in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs in the Pit 7 Complex Area are discussed below.

Qal/WBR HSU

During first semester 2016, VOCs at concentrations above the 0.5 µg/L reporting limit were not detected in any of the Pit 7 Complex area Qal/WBR HSU monitor wells. Similarly, VOCs were not detected in Qal/WBR HSU wells above reporting limits in first semester 2015. Total VOC concentrations in Qal/WBR HSU ground water in the Pit 7 Complex area have decreased from a historic maximum of 21 µg/L in 1995 (monitor well NC7-51, located immediately downgradient of Pit 3, comprised of 15 µg/L TCE and 6.2 µg/L 1,1-DCE) to below the 0.5 µg/L reporting limit in first semester 2016.

Tnbs₁/Tnbs₀ HSU

During first semester 2016, TCE concentrations above the 0.5 µg/L reporting limit were detected in two Pit 7 Complex area Tnbs₁/Tnbs₀ HSU wells. Monitor well K7-03 contained 0.97 µg/L TCE (routine sample; 0.92 µg/L in the duplicate sample, April) and extraction well W-PIT7-2307 contained 0.88 µg/L TCE (May). Total VOC concentrations in the Tnbs₁/Tnbs₀ HSU have decreased from the historic maximum of 15.2 µg/L (8.7 µg/L TCE, 4.5 µg/L 1,2-DCE, 0.8 µg/L PCE, and 1.2 µg/L 1,1,1-TCA) measured in the 1985 ground water sample collected from monitor well K7-03.

Monitor well K7-01, located immediately downgradient of Pit 5 and completed in both HSUs, contained 0.59 µg/L TCE (April).

2.5.5.3. Pit 7 Complex Area of OU 5 Remediation Optimization and Performance Evaluation

Ground water extraction and treatment at the PIT7-SRC facility began in March 2010. A wellfield expansion in second semester 2012 added wells W-PIT7-2703, W-PIT7-2704 and W-PIT7-2705 to the Pit 7 extraction wellfield. In addition to the new extraction wells, extraction of ground water from NC7-25, screened in the Tnbs₁/Tnbs₀ bedrock HSU, was initiated and the pump intake in well W-PIT7-2307 was raised to target the Qal/WBR HSU.

During first semester 2016, only six (NC7-25, NC7-64, W-PIT7-2305, W-PIT7-2307, W-PIT7-2703, and W-PIT7-2705) of the eight PIT7-SRC extraction wells were operable

throughout the entire reporting period due to ongoing drought conditions. Wells W-PIT7-2306 and W-PIT7-2704 did not contain sufficient water for pumping at any time during first semester 2016. The lack of recharge combined with the low permeability of the HSU materials limited the long-term average ground water extraction flow rate from the entire PIT7-SRC extraction wellfield to less than 0.1 gpm with the majority of the flow contributed by well W-PIT7-2305. Table Summ-1 lists the volume of ground water treated at PIT7-SRC during first semester 2016 as 17,000 gallons. Check valves installed at the end of 2015 have produced more accurate flow rates in all extraction wells, correcting the overestimation of flow discussed in the 2015 Annual CMR.

Though the yields from the PIT7-SRC extraction wells are extremely low, the wells are located in areas with high COC concentrations and have been removing COC mass since ground water extraction began in 2010. Concentrations of COCs in ground water from well W-PIT7-2305, which provides most of the flow to the PIT7-SRC facility, have fluctuated since pumping started in 2010, but have shown decreases from pre-pumping conditions to present. For example:

- Tritium activities decreased from 73,900 pCi/L (January 2010) to 33,700 pCi/L (April 2016).
- Uranium activities decreased from 21 pCi/L (2010) to 15 pCi/L (April 2016). Since 2008, the ground water from this well has contained only natural uranium.
- TCE concentrations were below the 0.5 µg/L reporting limit (January 2010), were 0.63, 0.67 and 0.52 µg/L in May 2010, October 2010 and April 2011, respectively, and have remained below the 0.5 µg/L reporting limit since October 2011.

In addition to the long-term trends observed in W-PIT7-2305, operation of W-PIT7-2307 in February and March 2015 extracted TCE from ground water in the Pit 7 Complex Area for the first time since 2013; TCE extraction continued during first semester 2016 while W-PIT7-2307 was operational. Well NC7-25 was activated as an extraction well in August 2012 to increase uranium mass removal; even though this well had historically always exhibited a natural $^{235}\text{U}/^{238}\text{U}$ atom ratio, it exceeded the 20 pCi/L MCL cleanup standard. After two years of ground water extraction, the October 2014 ground water sample yielded a total uranium activity of 100 pCi/L, a significant increase and historic maximum for this well, with a $^{235}\text{U}/^{238}\text{U}$ ratio of 0.0066, indicating the presence of some depleted uranium for the first time in this well. Following two months of inactivity in 2015, uranium activity decreased and isotopic ratio returned to natural (34 pCi/L with a $^{235}\text{U}/^{238}\text{U}$ atom ratio of 0.0071). During first semester 2016, uranium activity revealed both depleted (52 pCi/L, 0.00694 isotopic ratio) and natural activities (37 pCi/L, 0.00702 isotopic ratio). Given the low yields of the HSU materials and the current climate conditions, the PIT7-SRC extraction wellfield is operating as well as can be expected.

2.5.5.4. Pit 7 Complex Area of OU 5 Remedy Performance Issues

MNA for tritium continues to be effective and protective of human health and the environment, and to make progress toward cleanup. The extraction and treatment of uranium, perchlorate, VOCs and nitrate continue to reduce the concentrations and masses of these contaminants in Pit 7 Complex ground water.

During first semester 2016, tritium activities in treated effluent from PIT7-SRC ranged from 34,600 pCi/L to 38,500 pCi/L. Tritium activities in performance monitor wells NC7-16 and

NC7-21, located directly downgradient of the effluent discharge trench, are lower than the treated effluent activities and continue to exhibit decreasing tritium trends. The tritium activities in these wells will continue to be closely monitored to assess any negative impacts to the distribution of tritium in ground water. The performance summary of PIT7-SRC indicates that:

- Progress has been made in reducing COC concentrations towards cleanup standards. Uranium activities to date have remained relatively stable, and those in excess of MCL cleanup standards are limited in extent. TCE concentrations have dropped below the MCL cleanup standard. Perchlorate concentrations are stable to decreasing. Nitrate concentrations and distribution have decreased from historic maxima.
- The extent of uranium in excess of the MCL cleanup standard in the Qal/WBR HSU continues to be confined to an area immediately east of Pit 3 and another area that extends from Pit 5 southeast about 500 ft. Although the uranium isotopic compositions in ground water samples are slowly trending toward natural, the extents of uranium in both these regions have remained stable and similar to what has been observed over the last few years.
- Tritium activities in wells downgradient of the infiltration trench are decreasing, indicating that the discharge of tritium-bearing water is not adversely impacting downgradient ground water.

As discussed in the Remedial Design (RD) for the Pit 7 Complex (Taffet et al., 2008), the drainage diversion system design was not intended to capture 100% of the precipitation that falls in the Pit 7 Complex area. Rather, it was designed to divert excess surface water runoff and shallow subsurface recharge from the hillslopes to the west and east of the Pit 7 Complex landfills during high intensity storms and periods of extreme rainfall (i.e., the 1997-1998 El Niño) to minimize ground water contact with the pit waste and underlying contaminated bedrock. Thus, the drainage diversion system performance can best be evaluated during a future El Niño season or other period of very high rainfall.

Criteria indicating that the drainage diversion system is not operating as intended and corresponding recent performance include:

1. Ground water elevation responses to rainfall events observed in key monitoring wells are similar to those observed before the installation of the drainage diversion system:
 - Drainage diversion system performance is evaluated by 22 monitor wells outfitted in April 2010 with dedicated pressure transducers that measure ground water elevations.
 - Review of these data indicate that ground water elevation responses to rainfall are less than those observed prior to drainage diversion system installation in several wells. For example, in 2005, prior to installation of the drainage diversion system, ground water elevation in well NC7-17, located downgradient of the drainage diversion system at the south end of Pit 7, increased 5 inches per inch of rain received. In 2011, after installation of the drainage diversion system, ground water elevation increased less than 4 inches per inch of rain received for the same time period during the water year. These data indicate a 20% reduction in ground water elevation response to rainfall in well NC7-17 after installation of the drainage diversion system. Total precipitation received during water years 2004-2005 and 2010-2011 was greater than average and almost identical at 13.7 inches and 13.5 inches, respectively. Precipitation received during rainfall years following 2010-

- 2011 until 2015-2016 has been below average and water elevation response evaluations have not been performed for these time periods. During the 2015-2016 water year, precipitation was above average and nearly equal to 2004-2005 and 2010-2011 at 13.8 inches. Ground water elevation in NC7-17 increased less than 4 inches per inch of rain received, suggesting that the drainage diversion continues to be effective.
2. Maximum ground water rises into the pit waste and underlying contaminated bedrock as indicated by ground water elevation data:
 - Ground water levels have remained well below the bottoms of the Pit 7 Complex Landfills. Above average rainfall resulted in a period of ground water elevation increase in Qal/WBR HSU wells in first semester 2016, however, elevations have since started to decrease. Prior to first semester 2016, ground water elevations in the Qal/WBR HSU have been decreasing since spring 2011 due to below average rainfall.
 3. Increasing trends in tritium, uranium, VOCs or perchlorate activities/concentrations are observed over a period of at least four quarters in ground water samples from key wells downgradient of the landfills:
 - COC trends in Pit 7 Complex ground water are decreasing:
 - Tritium activities decreased from a historic maximum of 2,660,000 pCi/L in 1998 to a first semester 2016 maximum of 281,000 pCi/L.
 - Uranium activities have decreased from a historic maximum of 781 pCi/L in 1998 to a first semester 2016 maximum of 127 pCi/L.
 - Nitrate concentrations have decreased from the historic maximum of 363 mg/L in 2003 to a first semester 2016 maximum of 65 mg/L.
 - Perchlorate concentrations have decreased from a historic maximum of 40 µg/L in 2009 to a first semester 2016 maximum of 14 µg/L.
 - Total VOC concentrations have decreased from a historic maximum of 21.2 µg/L in 1995 to a first semester 2016 maximum of 0.97 µg/L, with concentrations of all VOC COCs below cleanup standards.

Based on the evaluation of ground water elevation and contaminant activity/concentration data collected from Pit 7 Complex area wells against the performance criteria, the drainage diversion system appears to be operating as intended. However, it is important to note that the drainage diversion system is designed to divert recharge during peak events and has not yet been tested under the conditions for which it was designed.

2.6. Building 854 OU 6

The Building 854 Complex has been used to test the stability of weapons and weapon components under various environmental conditions and mechanical and thermal stresses. A map of the Building 854 OU showing the locations of monitor and extraction wells and treatment facilities is presented on Figure 2.6-1.

Three ground water treatment systems are currently operated in the Building 854 OU; Building 854-Source (854-SRC), Building 854-Proximal (854-PRX), and Building 854-Distal (854-DIS). One soil vapor treatment system is also operated at the 854-SRC facility.

The 854-SRC ground water treatment system began operation in December 1999 removing VOCs and perchlorate from ground water. The 854-SRC ground water treatment system was offline during all of first semester 2016 for engineering upgrades (REVAL). Operational flow rates will be higher and more consistent following the REVAL upgrades, including upgrades to the data acquisition system and the programmable logic controller (PLC) strategy. Testing and verification (T&V) operations will be initiated in August and the 854-SRC ground water treatment system is scheduled to resume normal operation during second semester 2016. Although the 854-SRC treatment facility is being upgraded as part of the REVAL process, the ground water treatment system configuration, which includes a particulate filtration system, two ion-exchange resin columns connected in series for perchlorate removal, and three aqueous-phase GAC units connected in series for VOC removal, will not change. Nitrate-bearing treated effluent will continue to be discharged via a misting tower onto the landscape for uptake and utilization of the nitrate by indigenous grasses.

Soil vapor treatment began at 854-SRC in November 2005. Soil vapor is extracted from one soil vapor extraction well, W-854-1834, at an approximate flow rate ranging from 46 to 50 scfm. This system consists of a rotary-lobe blower to create vacuum at the wellhead, and a series of pipes leading to vapor-phase GAC by which VOCs are removed from extracted soil vapor. Treated vapors are discharged to the atmosphere under a permit issued by the San Joaquin Valley Air Pollution Control District. This system has been offline during first semester 2016 for REVAL, although there are no significant upgrades to this system planned as part of the REVAL process. The 854-SRC soil vapor treatment system will resume normal operation during second semester 2016.

The 854-PRX ground water treatment system began removing VOCs, nitrate and perchlorate from ground water in November 2000. During first semester 2016, ground water was extracted at an initial flow rate of 4.8 gpm from a single extraction well, W-854-03, located southeast of the Building 854 complex. In May 2016, the flow rate was reduced to approximately 3.4 gpm after it was determined that the influent nitrate concentrations had increased during the higher flow rates while the perchlorate concentrations declined to below the 4.0 $\mu\text{g/L}$ analytical reporting limit. This flow rate is still a significant increase from the extraction rate that averaged 1.5 gpm before the 2014 REVAL upgrades. The ground water treatment system configuration includes a particulate filtration system, two ion-exchange resin columns connected in series for perchlorate removal, and three aqueous-phase GAC units connected in series for VOC removal. An additional nitrate ion-exchange column is available in the event that nitrate concentrations exceeds the discharge limit of 45 mg/L.

The 854-DIS ground water treatment system is solar-powered and began operation in July 2006 removing VOCs and perchlorate from ground water. Ground water is extracted from well W-854-2139, which operates cyclically. The operational flow rate ranged from 30 to 40 gallons per month during the two months the facility was operational (May and June) in first semester 2016. The ground water treatment system configuration includes two ion-exchange resin columns connected in series for perchlorate treatment followed by three aqueous-phase GAC units connected in series for VOC removal prior to discharge to an infiltration trench.

Nitrate concentrations are low at this location; therefore no nitrate removal is currently needed at this ground water treatment system.

2.6.1. Building 854 OU Ground Water Treatment System Operations and Monitoring

This section is organized into five subsections: facility performance assessment; operations and maintenance issues; receiving water monitoring; compliance summary; and sampling plan evaluation and modifications.

2.6.1.1. Building 854 OU Facility Performance Assessment

The monthly ground water discharge volumes, rates and operational hours for first semester 2016 are summarized in Tables 2.6-1 through 2.6-3. The total volume of ground water treated and masses removed during the reporting period are presented in Table Summ-1. The cumulative volume of ground water treated and discharged and the masses removed are summarized in Table Summ-2. Analytical results for influent and effluent samples collected during first semester 2016 are presented in Tables 2.6-4 and 2.6-5. The pH measurement results are presented in Appendix A.

2.6.1.2. Building 854 OU Operations and Maintenance Issues

The following maintenance activities and operational issues occurred at the 854-SRC ground water treatment system and soil vapor treatment system, and 854-PRX and 854-DIS ground water treatment systems during first semester 2016:

854-SRC ground water treatment system and soil vapor treatment system

- Both the ground water treatment system and the soil vapor treatment system were taken offline on November 16, 2015 for a complete system rebuild and were offline for the first semester of 2016.

854-PRX ground water treatment system

- The ground water treatment system was shut down on November 17, 2015 for freeze protection and not restarted until April 5, 2016.
- The ground water treatment system shut down on June 3, 2016 due to a high temperature interlock and was restarted on June 6. Effluent samples collected upon restart indicated nitrates above the discharge limit, which necessitated shutting the system down from June 8 until June 13 to evaluate.

854-DIS ground water treatment system

- The ground water treatment system was offline for most of the reporting period to evaluate well production problems and accommodate freeze protection. The system was restarted on May 17, 2016 after replacing the extraction pump, and ran uninterrupted for the remainder of the reporting period.

2.6.1.3. Building 854 OU Compliance Summary

The 854-DIS ground water treatment system operated in compliance with the RWQCB Substantive Requirements for Wastewater Discharge. The 854-SRC ground water and soil vapor extraction and treatment systems did not operate during this reporting period.

Nitrate concentrations of 76 mg/L in an effluent sample collected at the 854-PRX GWTS immediately upon restart of the system on June 6, 2016 exceeded the discharge limit of 45 mg/L. The effluent was resampled on June 8 and the system immediately shut down pending results. Nitrate concentrations in this sample were reported at 39 mg/L. The system was restarted on June 13, and another nitrate effluent sample collected on June 15. The nitrate concentration in this sample was reported at 37 mg/L. The initial spike of high nitrates may have been related to the initially high extraction rate of 5.5 gpm, but seemed to be of short duration. Although the maximum daily nitrate concentration of 45 mg/L was exceeded, the monthly median for nitrate was within the discharge limits.

2.6.1.4. Building 854 OU Facility Sampling Plan Evaluation and Modifications

The Building 854 OU facility sampling and analysis plan complies with the monitoring requirements in the CMP/CP. The sampling and analysis plan is presented in Table 2.6-6. There were no modifications to the plan during this reporting period.

2.6.1.5. Building 854 OU Treatment Facility and Extraction Wellfield Modifications

There were no treatment facility or extraction wellfield modifications performed for the 854-DIS or 854-PRX ground water treatment systems during the first semester 2016. The 854-SRC groundwater treatment system and the 854-SRC soil vapor treatment system were undergoing REVAL for engineering upgrades and facility optimization during this reporting period. The system modifications will be discussed in the 2016 Annual CMR.

2.6.2. Building 854 OU Ground Water Monitoring

The sampling and analysis plan for ground water and surface water monitoring is presented in Table 2.6-7. This table also explains any deviations from the sampling plan.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions:

- Three analyses in extraction well W-854-2218 and three in well W-854-02 were not performed because the well locations were under construction.
- A total of 15 analyses in four different wells and one spring were not performed because the wells or spring were dry or there was insufficient water for sample collection.

Analytical results and ground water elevation measurements obtained during first semester 2016 are presented in Appendices B and C, respectively.

2.6.3. Building 854 OU Remediation Progress Analysis

This section is organized into four subsections: mass removal; analysis of contaminant distribution and concentration trends; remediation optimization evaluation; and performance issues.

2.6.3.1. Building 854 OU Mass Removal

The monthly ground water mass removal estimates for first semester 2016 are summarized in Tables 2.6-8 through 2.6-10. The total mass removed during the reporting period and cumulative mass estimates are summarized in Table Summ-1 and Table Summ-2, respectively.

2.6.3.2. Building 854 OU Contaminant Concentrations and Distribution

At the Building 854 OU, TCE and perchlorate are the primary COCs detected in ground water; nitrate is a secondary COC. These COCs have been detected primarily in the Tnbs₁/Tnsc₀ HSU. The locations of the wells discussed in the following text are shown on the Building 854 OU site map (Figure 2.6-1).

2.6.3.2.1. VOC Concentrations and Distribution

Total VOCs are present primarily in the Tnbs₁/Tnsc₀ HSU and in one well screened in the shallower Qls/Tnbs₁ HSU.

Qls/Tnbs₁ HSU

In the Qls/Tnbs₁ HSU, during first semester 2016, 52 µg/L total VOCs (entirely TCE, June) were detected in a routine sample of shallow perched ground water in monitor well W-854-10 (screened in the Tnbs₁ unit but above the Tnbs₁/Tnsc₀ HSU) in the Building 854 source area. Though concentrations in this well have been variable since 2006, ranging from 2.5 to 40 µg/L, the 60 µg/L detection in November 2015 is the highest concentration of total VOCs historically detected in this well. This is discussed further in the remediation optimization evaluation summary (Section 2.6.3.3). During first semester 2016, VOCs were not detected above the reporting limit in any other well completed in the Qls/Tnbs₁ HSU.

Tnbs₁/Tnsc₀ HSU

Total VOC concentrations in Tnbs₁/Tnsc₀ HSU ground water have been reduced from a historic pre-remediation maximum of 2,900 µg/L (extraction well W-854-02, 1997) to a first semester 2016 total VOC concentration of 25 µg/L in well W-854-17 (June). Well W-854-02 was not sampled during the reporting period because it was offline for REVAL. TCE comprises all of the VOCs observed in ground water at Building 854, except for low cis-1,2-DCE concentrations detected in two wells. The first semester 2016 maximum cis-1,2-DCE concentrations detected in these wells were 16 µg/L in monitor well W-854-17 (June, above the 6 µg/L MCL cleanup standard) and 0.71 µg/L in extraction well W-854-2139 (May).

Two VOC plumes exist in the Tnbs₁/Tnsc₀ HSU: the northern plume and southern plume. The northern plume is located beneath the 854-SRC and 854-PRX areas and is separated from the southern plume by a region where two monitor wells, W-854-1902 and W-854-1822, have not yielded detectable VOCs above their respective reporting limits since sampling began in 2002. The high-concentration portion of the southern plume is in the vicinity of Well 13, a former water-supply well. The southern plume extends south where low TCE concentrations have been sporadically detected at Springs 10 and 11. The overall extent of VOCs impacting Building 854 ground water with concentrations above the 0.5 µg/L reporting limit has remained relatively stable since remediation began. However, (1) the extent of the northern VOC plume with concentrations greater than 50 µg/L has decreased and is currently limited to the immediate vicinity of the Building 854 source area; (2) the extent of the southern VOC plume with concentrations greater than 10 µg/L has decreased; and (3) VOC concentrations in the southern plume, although they fluctuate considerably, are still decreasing.

The maximum historic total VOC vapor concentration (entirely TCE) in the Building 854 source area was detected in 854-SRC soil vapor treatment system extraction well W-854-1834 (4.4 ppm_{v/v}, November 2005). The 2015 maximum total VOC vapor concentration for this well was 0.25 ppm_{v/v}, measured in October and collected during normal vapor extraction operation.

Vapor concentrations in this well have not been detected above 0.5 ppm_{v/v} since 2007. The overall decline in total VOC vapor concentration indicates significant progress in remediation of VOCs in vapor in this area. The reporting limit for TCE in soil vapor is 0.03 ppm_{v/v}. The soil vapor treatment system has been offline for REVAL since November 2015. Rebound soil vapor samples will be collected during second semester 2016.

2.6.3.2.2. Perchlorate Concentrations and Distribution

Perchlorate is present in the Tnbs₁/Tnsc₀ HSU but not the shallower Qls/Tnbs₁ HSU.

Qls/Tnbs₁ HSU

During the reporting period, perchlorate concentrations were below the 4 µg/L reporting limit in all wells screened in the Qls HSU or perched Tnbs₁ water-bearing zones.

Tnbs₁/Tnsc₀ HSU

During first semester 2016, perchlorate concentrations at or exceeding its 6 µg/L MCL cleanup standard were detected in three Tnbs₁/Tnsc₀ HSU monitor wells: W-854-07, W-854-45, and W-854-1823. Perchlorate concentrations in Tnbs₁/Tnsc₀ HSU ground water have decreased from a historic maximum of 27 µg/L (W-854-1823, 2003) to a first semester 2016 maximum of 15 µg/L (W-854-1823, June). Monitor well W-854-1823 is located downgradient of the 854-PRX facility and perchlorate concentrations have been slightly declining in this well since 2003. The distribution and concentrations of perchlorate in Tnbs₁/Tnsc₀ HSU ground water during the reporting period are similar to those observed in previous years, except for a detection of 5.2 µg/L (W-854-08, June) and concentrations did not exceed the reporting limit of 4 µg/L throughout first semester 2016 at extraction well W-854-03, except for a single 4.5 µg/L detection (April). With the exception of this detection, perchlorate has not been detected in extraction well W-854-03 since October 2014. This is discussed further in the remediation optimization evaluation summary (Section 2.6.3.3). At 854-DIS, perchlorate has steadily decreased in extraction well W-854-2139, with first semester 2016 detections of 4.8 and 4.1 µg/L (May and June, respectively), but has increased in monitor well W-854-07, with first semester 2016 detections of 7.2 and 7.5 µg/L. This is discussed further in Section 2.6.3.3. Perchlorate at well W-854-45, located in the Building 858 Drop Tower area, is not currently captured by any ground water extraction well(s). Perchlorate concentrations in W-854-45 have decreased from a historic maximum of 15.2 µg/L (2011) to a first semester 2016 maximum concentration of 9.4 µg/L.

2.6.3.2.3. Nitrate Concentrations and Distribution

During first semester 2016, the maximum nitrate concentration in Building 854 OU area ground water was 200 mg/L in monitor well W-854-14 (June), screened in the Qls HSU and located near the Building 858 Drop Tower. Nitrate in this well has been steadily decreasing from the historic maximum of 270 mg/L (2009). Nitrate concentrations in well W-854-45, located in the Building 858 Drop Tower area, have shown a steadily increasing trend from 2004 (16 mg/L) to first semester 2016 (62 mg/L, June). However, other wells that contain nitrate above the 45 mg/L cleanup standard had steady or decreasing nitrate concentrations during this same period. All of the wells containing ground water with nitrate concentrations exceeding the 45 mg/L MCL cleanup standard are located in the vicinity of the Building 854 Complex or Building 858.

2.6.3.3. Building 854 OU Remediation Optimization Evaluation

During first semester 2016, the 854-SRC was offline for REVAL. An engineering evaluation and upgrade of the 854-SRC ground water treatment system and soil vapor treatment system is underway and will address performance issues of W-854-2218 and contribute to more continuous operation of the ground water treatment system. Following completion of T&V procedures in August, the 854-SRC ground water treatment system will resume operation.

At the 854-SRC soil vapor treatment system, no VOC vapor mass was removed during first semester 2016, also due to the facility being offline for REVAL. The 854-SRC soil vapor treatment system will resume normal operation during second semester 2016. Despite low VOC vapor concentrations, VOC mass continues to be removed from the source area due to relatively high vapor flow rates. This VOC mass is likely volatilizing from residual TCE in the vadose zone beneath the Building 854 source area and from the dissolved VOC plume in Tnbs₁/Tnsc₀ ground water beneath the SVE well. Due to continued removal of VOC mass, DOE/LLNL plan to operate the 854-SRC soil vapor treatment system until vapor concentrations remain below reporting limits after extended shutdown periods and SVE shutoff criteria have been met. Over the next several years, it will be determined if prerequisites to begin a SVE system shut-off evaluation have been attained. This process will begin with a vapor rebound test, which will be performed upon restart of the SVE system, during second semester 2016.

During first semester 2016, the 854-PRX groundwater treatment system removed an estimated 20 g of VOC mass, 1.8 g of perchlorate, and 56 kg of nitrate. By comparison, during first semester 2015, 31 g of VOC mass and 190 kg of nitrate were removed. No perchlorate mass was removed during this time period.

In order to optimize remedial performance of the ground water treatment system, extraction rates at W-854-03 were lowered to minimize hydraulic capture of nitrate-bearing groundwater that contained low concentrations of TCE and perchlorate. Although the total volume of ground water extracted during first semester 2016 was approximately 25% of the total volume extracted during first semester 2015, the ratio of COC mass removal to volume of water extracted in first semester 2016 more than doubled for VOCs, increased for perchlorate, while maintaining nitrate concentrations below the 45 mg/L MCL. This result supports the hypothesis that increased extraction rates in 2015 resulted in a dilution of TCE to the treatment system influent, reducing the efficiency of the ground water treatment system. Reducing the pumping rate has increased the ratio of mass removed/volume of water extracted for both VOCs and perchlorate while maintaining nitrate levels below the 45 mg/L MCL, and has thus increased the efficiency of the ground water treatment system.

During first semester 2016, the 854-DIS ground water treatment system operated only from mid-May through June because of well maintenance activities. During this time, the 854-DIS ground water treatment system removed 0.0067g of VOC mass, 0.0012 g of perchlorate, and 0.0049 kg of nitrate. The mass removal remains steady, though relatively low due to extraction volumes at extraction well W-854-2139. TCE concentrations in ground water extraction well W-854-2139 have remained stable, with a first semester 2016 concentration of 26 µg/L. TCE concentrations in this area will be closely monitored for future long-term trends. While perchlorate concentrations in W-854-2139 have remained relatively close to the reporting limit of 4 µg/L, with detections of 4.9 and 4.1 µg/L (May and June), concentrations in down-gradient monitor well W-854-07 have slightly increased, with a first semester 2016 maximum of 7.5 µg/L

(June). Possible causes of and solutions for this issue will be discussed in an upcoming initial Conceptual Design Review meeting to determine possible REVAL for 854-DIS in FY17.

2.6.3.4. Building 854 OU Remedy Performance Issues

There were no new issues that affect the performance of the cleanup remedy for the Building 854 OU during this reporting period. As discussed in Section 2.6.3.3, the ongoing performance issues with 854-SRC extraction well W-854-2218 will be addressed in the engineering evaluation and upgrade of this facility currently in progress. Also, the installation of a data acquisition system to monitor hydraulic response to pumping will allow for improved performance assessment at this facility.

The overall remedy continues to be effective and protective of human health and the environment, and to make progress toward cleanup.

2.7. Building 832 Canyon OU 7

Starting in the late 1950s and early 1960s, facilities in the Building 830 and 832 facilities were used to test the stability of weapon components under various environmental conditions. Testing at the Building 830 and 832 facilities was discontinued in 1985.

Contaminants were released from Buildings 830 and 832 through piping leaks and surface spills during testing activities at these buildings.

Three ground water treatment systems and two soil vapor treatment systems are operated in the Building 832 Canyon OU: Building 832-Source (832-SRC), Building 830-Source (830-SRC), and Building 830-Distal South (830-DISS). The 832-SRC and 830-SRC facilities extract and treat both ground water and soil vapor, while the 830-DISS facility extracts and treats ground water only.

A map of Building 832 OU showing the locations of monitor and extraction wells and treatment facilities is presented on Figure 2.7-1.

The 832-SRC ground water treatment system removes VOC and perchlorate mass from ground water and the soil vapor treatment system removes VOC mass from soil vapor. The ground water treatment system and soil vapor treatment system began operation in September and October 1999, respectively. During first semester 2016, ground water was extracted from wells W-832-01, W-832-11, W-832-12, W-832-15, and W-832-25 at an approximate combined flow rate averaging less than 1 gpm. Due to declining water levels, extraction wells W-832-10 and W-832-11 produced very small amounts of water during first semester 2016. During the same period, soil vapor was extracted from wells W-832-12 and W-832-15 at an approximate combined flow rate of 4.8 scfm. The current ground water treatment system configuration includes two ion-exchange resin columns connected in series to remove perchlorate, and three aqueous-phase GAC units (also connected in series) to remove VOCs. Nitrate-bearing treated effluent is then discharged via a misting tower over the landscape for uptake and utilization of the nitrate by indigenous grasses. A positive displacement rotary lobe blower is used to create a vacuum at selected wellheads through a system of piping manifolds. The contaminated vapors are treated using three vapor-phase GAC units connected in series. Treated soil vapors are then discharged to the atmosphere under a permit issued by the San Joaquin Valley Air Pollution Control District.

The 830-SRC ground water treatment system removes VOCs and perchlorate from ground water and the soil vapor treatment system removes VOCs from soil vapor. The ground water treatment system and soil vapor treatment system began operation in February and May 2003, respectively. In 2014, both systems were dismantled and rebuilt under REVAL. The new system became operational during the second semester of 2015. The new ground water treatment system configuration includes two ion-exchange resin columns connected in series to remove perchlorate and three aqueous-phase GAC units connected in series to remove VOCs. A valve located between the ion-exchange resin columns and the GAC units allows non perchlorate-bearing influent to bypass perchlorate treatment. The current continuous-operational flow rate of the 830-SRC ground water treatment system is approximately 7.3 gpm. In 2014, as part of engineering upgrades under REVAL, an additional extraction well, W-830-2701, was connected and currently extracts water at approximately 2.3 gpm. The new configuration allows for real-time monitoring of pumping rates and ground water elevations of all extraction wells and a few performance monitor wells in 830-SRC area, and allows for better optimization of the remediation system. Nitrate-bearing treated effluent is currently discharged via a misting tower over the landscape for uptake and utilization of the nitrate by indigenous grasses. In 2015, two new wells were drilled as potential injection wells, W-830-3101 and W-830-3102 (Table 2.1). These wells (and an additional well, W-833-30) have been evaluated for use as injection wells and the pipeline expansions to connect these to 830-SRC ground water treatment system is currently in progress. New wells W-830-3101 and W-830-3102 are discussed in greater detail, in Section 2.7.1, Building 832 Canyon OU Facility Performance Assessment.

The 830-DISS ground water treatment system began operation in July 2000, removing VOCs, perchlorate, and nitrate from ground water. Ground water is currently extracted from wells W-830-51, W-830-52, W-830-53, and W-830-2216 at a combined flow rate of approximately 2.9 gpm. During the reporting period, approximately 0.7 gpm of ground water flowed from extraction well W-830-51 under natural artesian pressure; W-830-52 and W-850-53 produced minimal water over the same time period due to lack of flowing-artesian conditions at these locations. W-830-2216 is actively pumped at a flow rate of approximately 2.2 gpm. Currently, extracted ground water flows through ion-exchange canisters to remove perchlorate at the 830-DISS location and the ground water is then piped to the Central GSA ground water treatment system for VOC removal. Nitrate-bearing treated effluent is then discharged via a misting tower over the landscape for uptake and utilization of the nitrate by indigenous grasses.

2.7.1. Building 832 Canyon OU Ground Water and Soil Vapor Extraction and Treatment System Operations and Monitoring

This section is organized into four subsections: facility performance assessment; operations and maintenance issues; compliance summary; and sampling plan evaluation and modifications.

2.7.1.1. Building 832 Canyon OU Facility Performance Assessment

For first semester 2016, monthly ground water and soil vapor discharge volumes, rates, and operational hours are summarized in Tables 2.7-1 through 2.7-3. The total volume of ground water and vapor extracted and treated and mass removed during the reporting period are presented in Table Summ-1. The cumulative volume of ground water and soil vapor treated and discharged and mass removed are summarized in Table Summ-2. Analytical results for influent

and effluent samples collected during first semester 2016, are presented in Tables 2.7-4 and 2.7-5. The pH measurement results are presented in Appendix A.

2.7.1.2. Building 832 Canyon OU Operations and Maintenance Issues

The following maintenance activities and operational issues occurred at the 832-SRC ground water treatment system and soil vapor treatment system, 830-SRC ground water treatment system and soil vapor treatment system and 830-DISS ground water treatment system during first semester 2016:

830-SRC ground water treatment system and soil vapor treatment system

- The ground water treatment system was offline from the start of the reporting period until February 10, for freeze protection. The soil vapor treatment system was offline from the start of the reporting period until March 21, but on startup only utilized one of the soil vapor extraction wells, W-830-49. Soil vapor extraction on W-830-1807 was not initiated due to condensate issues affecting the ability to measure accurate flow rates.
- Both the ground water and soil vapor treatment systems were secured from May 19 until May 23 to repair a cracked coupler on the effluent line to the misting towers.
- Both the ground water and soil vapor treatment systems were secured from June 27 until June 28 due to electrical problems.

832-SRC ground water treatment system and soil vapor treatment system

- Both the 832-SRC ground water and soil vapor treatment systems were offline from the start of the reporting period until February 8, at which time only two of the extraction wells (W-832-12 and W-832-15) were restarted with both ground water and soil vapor extraction and treatment.
- Extraction wells W-832-01, W-832-11, W-832-10, and W-832-25 remained offline until February 16.
- Both 832-SRC ground water treatment system and soil vapor treatment system were secured from May 9 to June 14, due to a faulty pressure switch on the compressor.

830-DISS ground water treatment system

- The ground water treatment system was offline from the start of the reporting period until April 5, for freeze protection and evaluation of the misting tower motors.
- The ground water treatment system was secured from June 21 to June 27, due to the shutdown of the CGSA system.

830-DISS ground water treatment system

- The ground water treatment system was offline for freeze protection until April 5, 2016.
- The ground water treatment system was shut down on June 21 due to the shutdown of the CGSA system. The treatment system was restarted on June 27, 2016.

2.7.1.3. Building 832 Canyon OU Compliance Summary

The 832-SRC, 830-SRC, and 830-DISS ground water treatment systems operated in compliance with RWQCB Substantive Requirements during the reporting period. The 832-SRC and 830-SRC soil vapor treatment systems both operated in compliance with the San Joaquin Valley Air Pollution Control District permit limitations.

2.7.1.4. Building 832 Canyon OU Facility Sampling Plan Evaluation and Modifications

The Building 832 Canyon OU treatment facility sampling and analysis plan complies with the monitoring requirements in the CMP/CP. The sampling and analysis plan is presented in Table 2.7-6. No modifications were made to any of the plans during this reporting period.

2.7.1.5. Building 832 Canyon OU Treatment Facility and Extraction Wellfield Modifications

No modifications were made to the 832-SRC ground water or soil vapor treatment systems, the 830-SRC ground water or soil vapor treatment systems, or the 830-DISS ground water treatment system during this reporting period. Plans are in process to implement injection of treated water in place of misting at the 830-SRC treatment system, as discussed in the 2015 Annual CMR (Buscheck and Ferry, 2016).

2.7.2. Building 832 Canyon OU Ground Water Monitoring

The sampling and analysis plan for ground water and surface water monitoring is presented in Table 2.7-7. This table explains deviations from the sampling plan and indicates any additions made to the CMP.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions:

- A total of nine analyses in three wells were not performed because of inoperable or damaged sampling equipment.
- A total of 58 analyses in 18 different wells and one spring were not performed because the wells or springs were dry or there was insufficient water for sample collection.
- A total of one analysis in one artesian well was not performed because the artesian well did not have sufficient head to flow at the surface and is not equipped with a ground water pump.
- A total of 12 analyses in four different wells were not performed because the sampling locations were inaccessible.
- A total of four analyses in four different wells were not performed because the associated treatment facilities were turned off for freeze protection or engineering upgrades.

During first semester 2016, two new wells, W-832-3209 and W-832-3210, were installed in Building 832 Canyon OU. These wells are detailed in Table 2.1 and described below.

Well W-832-3209 is located approximately 25 ft southwest of monitor well W-832-05, and 100 ft south of Building 832 (Figure 2.7.1). The purpose of this well was to replace nearby existing well W-832-05 as a Tnsc_{1a/b} HSU monitor well downgradient of the 832-SRC area to fulfill a recommendation as part of the 2011 Building 832 Canyon OU Five-Year Review (Helmig et al., 2011). The well was completed as a monitor well in the Tnsc_{1a/b} HSU and

screened from 30 to 40 ft below the ground surface. Initial baseline sampling conducted in March (2016) yielded 25 µg/L trichloroethene, <4 µg/L perchlorate, and 100 mg/L nitrate.

Well W-832-3210 is located approximately 125 ft southeast of monitor well W-832-06, and 50 ft northwest of Building 832 (Figure 2.7.1). The purpose of this well was to replace nearby existing well W-832-06 as a Tnsc_{1a/b} HSU monitor well in 832-SRC area to fulfill a recommendation as part of the 2011 Building 832 Canyon OU Five-Year Review (Helmig, 2011). The well was completed as a monitor well in the Tnsc_{1a/b} HSU and screened from 30 to 40 ft below the ground surface. Initial baseline sampling conducted in March (2016) yielded 8.3 µg/L trichloroethene, 4.5 µg/L perchlorate, and 21 mg/L nitrate.

2.7.3. Building 832 Canyon OU Remediation Progress Analysis

This section is organized into four subsections: mass removal; contaminant concentrations and distribution; remediation optimization evaluation; and performance issues.

2.7.3.1. Building 832 Canyon OU Mass Removal

The monthly ground water and soil vapor mass removal estimates for first semester 2016 are summarized in Tables 2.7-8 through 2.7-10. The total masses removed during the reporting period and cumulative mass estimates are summarized in Table Summ-1 and Table Summ-2, respectively.

2.7.3.2. Building 832 Canyon OU Contaminant Concentrations and Distribution

At the Building 832 Canyon OU, VOCs (mostly TCE) are the primary COCs detected in ground water. The compound cis-1,2-DCE is a COC at both the Building 830 and 832 source areas; chloroform and PCE are COCs at the Building 830 source area. Perchlorate and nitrate are the secondary COCs. These constituents have been detected primarily in the Qal/WBR and Tnsc_{1a/b} HSUs. VOCs have also been detected at relatively low concentrations in the Tnbs₂ and Upper Tnbs₁ HSUs.

The 2016 Draft Second Five-Year Review Report for the Building 832 Canyon OU (McKaskey et al., 2016) contained a recommendation to consolidate the Tnsc_{1a} and Tnsc_{1b} stratigraphic units into one HSU. This was recommended because the preponderance of data collected (including COC distribution and trends and hydraulic response) support that these stratigraphic units are in direct hydraulic communication and should be considered as one HSU to more adequately address remediation in these zones. This recommendation was approved by the regulatory agencies and starting with this report, the Tnsc_{1a} HSU and the Tnsc_{1b} HSU will be discussed together, as the Tnsc_{1a/b} HSU (McKaskey et al., 2016).

2.7.3.2.1. VOC Concentrations and Distribution

VOCs detected in Building 830 area ground water consist primarily of TCE. During first semester 2016, the other VOCs present above the reporting limit in the Building 830 area were chloroform, cis-1,2-DCE, 1,2-DCA, PCE, 1,1,2-TCA, and Freon 11. Of these VOCs, only TCE and 1,2,-DCA were detected at concentrations above their MCL cleanup standards of 5 µg/L and 0.5 µg/L, respectively.

VOCs detected in Building 832 area ground water consist primarily of TCE. During first semester 2016, VOCs other than TCE present above the reporting limit in the Building 832 source area were chloroform, cis-1,2-DCE, 1,1,2-TCA, and Freon 11. Of these VOCs, only TCE

and cis-1,2-DCE were present in the Building 832 area at concentrations above their MCL cleanup standards of 5 µg/L and 6 µg/L, respectively.

VOC concentrations and distribution are discussed by HSU, below.

Qal/WBR HSU

Since remediation began in 2000 in the Building 830 source area, total VOC concentrations in Qal/WBR HSU ground water near 830-SRC have decreased by two orders of magnitude from a historic maximum of 10,000 µg/L in 2003 (well SVI-830-035) to a first semester 2016 maximum of 660 µg/L in the same well (entirely TCE, February).

Since remediation began in 1999 in the Building 832 source area, ground water total VOC concentrations in wells screened in the Qal/WBR HSU have decreased from a historic maximum of 1,800 µg/L in 1998 (well W-832-18) to a first semester 2016 maximum of 160 µg/L in monitor well W-832-23 (August). Qal/WBR well W-832-23 is screened in the Qal and weathered portion of the Tnsc_{1a/b} HSU. Since 1999, total VOC concentrations in this well have fluctuated seasonally over a broad range of concentrations from 23 to 690 µg/L, with a stable to slightly decreasing long-term trend. Total VOC concentrations in soil vapor are also declining in the Building 832 source area. Total VOC concentrations detected in soil vapor in well W-832-15 have decreased from a historic maximum concentration of 1.8 ppm_{v/v} in 2001 to a first semester 2016 maximum of 0.023 ppm_{v/v} (April). Neither W-832-15 nor W-832-12 have contained VOC concentrations in excess of 0.44 ppm_{v/v} since 2011.

During first semester 2016, total VOC concentrations in ground water samples taken from Qal/WBR HSU guard wells W-35B-01 and W-880-02, both located south of the Building 832 Canyon OU near the Site 300 southern boundary, were below the 0.5 µg/L reporting limit. Since 2011, none of the 20 ground water samples collected from guard well W-35B-01 exceeded the 0.5 µg/L VOC reporting limit. During the same time period, only four of 13 samples collected from guard well W-880-02 contained VOC concentrations above their respective reporting limits, with a maximum total of 0.61 µg/L in 2011.

Tnbs₂ HSU

Well W-830-2216 extracts ground water from the Tnbs₂ HSU. COCs in this well are likely due to a combination of sources located in the HE Process Area and Building 832 Canyon OUs. Since extraction began in 2007, total VOC concentrations in W-830-2216 have consistently declined from a historic maximum of 20 µg/L (2007) to a first semester maximum of 2.8 µg/L (April). TCE was the only VOC detected in extraction well W-830-2216 and nearby monitor well W-830-13 during 2015. Total VOC concentrations in monitor well W-830-13 have decreased from a historic maximum of 26 µg/L in 2006 to 2.0 µg/L in March 2016. TCE concentrations in this well have remained consistently below the 5 µg/L MCL cleanup standard since 2012, indicating that extraction well W-830-2216 is capturing the higher concentrations of VOCs in the plume. The extracted ground water is treated at the 830-DISS and Central GSA treatment facilities.

While these Tnbs₂ HSU wells are located within the technical boundary of the Building 832 Canyon OU, the performance of these wells is discussed in more detail in HE Process Area OU section. The boundary of HE Process Area OU overlaps in this area, however the remedy performance of the entire Tnbs₂ HSU is evaluated as a single continuous contaminated HSU, rather than being split and discussed in two different OUs.

Tnsc_{1a/b} HSU

Since recognition and remediation of the Tnsc_{1a} stratigraphic zone began in early 2007, total VOC concentrations in ground water at both Building 830 and 832 source areas have generally decreased from the historic maximum of 1,700 µg/L in 1998 (monitor well W-830-27). However, in 2015 baseline constituent and routine samples from new extraction well W-832-3019, total VOCs were detected at 1,500 µg/L (April) and 1,600 µg/L (August), respectively. Routine sampling of this well in 2016 yielded higher total VOC results of 1,700 (February) and 1,800 (June). Plans are in place to connect well W-830-3019 to the 832-SRC ground water treatment system and soil vapor treatment system as a dual extraction well in the near future. Until that time, W-830-3019 will function as a monitor well. Total VOCs measured in other Tnsc_{1a/b} wells during the reporting period were stable compared to previous reporting periods.

Since remediation began in 2000 in the Building 830 source area, total VOC ground water concentrations in the Tnsc_{1a/b} HSU have decreased from a historic maximum of 13,000 µg/L (extraction well W-830-49, 2003) to a first semester 2016 maximum of 2,200 µg/L in the same well (April).

In the 830-DISS area, total VOC concentrations in Tnsc_{1a/b} HSU wells have decreased from a historic maximum of 170 µg/L (extraction well W-830-51, 2002) to a first semester 2016 maximum of 28 µg/L in monitor well W-830-10 (February). Farther south along Building 832 Canyon, the leading edge of the Tnsc_{1b} VOC plume continues to be contained within the Site 300 boundary based on total VOC concentrations below the 0.5 µg/L reporting limit in guard wells W-880-03, W-830-1730, and W-4C.

Upper Tnbs₁ HSU

Since remediation began in the Upper Tnbs₁ HSU, total VOC concentrations in ground water have decreased from a historic maximum of 100 µg/L in 1998 (monitor well W-830-28) to a first semester 2016 maximum of 20 µg/L (extraction well W-830-2215, February). Monitor well W-830-18, which has had the highest concentrations in the recent past and serves as the performance monitor well for extraction well W-830-2215, could not be sampled during the reporting period due to a delay in redevelopment of the well. Total VOC concentrations in W-830-18 have increased since pumping of extraction well W-830-2215 began in 2006. This increasing trend in W-830-18 indicates the plume is being captured by the adjacent extraction well. In Upper Tnbs₁ guard wells W-830-15 and W-832-2112, VOCs have not exceeded their reporting limits since the wells were installed in 1995 and 2005, respectively.

2.7.3.2.2. HE Compound Concentrations and Distribution

Including first semester 2016, HE compounds have never been detected in ground water in any Building 832 Canyon OU wells.

2.7.3.2.3. Perchlorate Concentrations and Distribution

In the Building 832 Canyon OU, perchlorate has historically been detected in the Qal/WBR and Tnsc_{1a/b} HSUs. Including first semester 2016, perchlorate has not been detected in monitor and extraction wells in the Upper Tnbs₁ HSU except due to analytical laboratory errors.

Qal/WBR HSU

Perchlorate concentrations in the Qal/WBR HSU have decreased in the Building 830 and 832 source areas from a historic maximum of 51 µg/L (monitor well W-830-34, 1998) to a first

semester 2016 maximum of 11 $\mu\text{g/L}$ (monitor well W-832-13, February). During first semester 2016, perchlorate was not detected in this HSU above the 4 $\mu\text{g/L}$ reporting limit in the 830-DISS area, or in Qal/WBR HSU guard wells W-35B-01 and W-880-02. Several wells that have previously yielded perchlorate did not contain sufficient ground water for sampling during the reporting period, due to prolonged drought conditions and a declining water table beneath the well screens (e.g. W-832-18, SVI-830-032, and W-832-21). These wells are monitored for presence of water and are sampled when sufficient water is available.

Tnbs₂ HSU

Perchlorate detections in the Building 832 Canyon OU Tnbs₂ HSU have all been below the 4 $\mu\text{g/L}$ reporting limit, except for one detection in extraction well W-830-2216 (4.2 $\mu\text{g/L}$, 2007) and two detections in nearby monitor well W-830-13 (4.1 $\mu\text{g/L}$, 2004 and 4.7 $\mu\text{g/L}$, 2006). The source of perchlorate contamination in these Building 832 Canyon area wells is the Tnbs₂ perchlorate plume in the HE Process Area. During first semester 2016, perchlorate was not detected in Tnbs₂ wells in Building 832 Canyon OU.

Tnsc_{1a/b} HSU

In the Building 830 and 832 source areas, perchlorate concentrations in the Tnsc_{1a/b} HSU generally continue a relatively stable to decreasing trend. During first semester 2016, the maximum perchlorate concentration detected in the Tnsc_{1a/b} HSU was 13 $\mu\text{g/L}$ in future extraction well W-832-3019 (June), above the 6 $\mu\text{g/L}$ cleanup standard. DOE/LLNL have completed the design for pipeline routing and other modifications to the 832-SRC facility needed to connect W-830-3019 as a dual extraction well to the 832-SRC ground water and soil vapor treatment system in the near future, which will include perchlorate treatment. Including first semester 2016, perchlorate has never been detected in Tnsc_{1a/b} guard wells W-830-1730 and W-4C.

In the 830-DISS area, perchlorate concentrations have remained steady to decreasing. However, during first semester 2016, a ground water sample from Tnsc_{1a/b} guard well W-880-03 yielded 8 $\mu\text{g/L}$ perchlorate (month). Perchlorate has historically been below reporting limits at this well. The results of this analysis are under review and will be further discussed in the 2016 Annual Compliance Monitoring Report along with additional sampling planned.

Upper Tnbs₁ HSU

Including first semester 2016, since 2005 perchlorate detections in the Upper Tnbs₁ HSU have all not exceeded the 4 $\mu\text{g/L}$ reporting limit, except for analytical laboratory errors as discussed above.

2.7.3.2.4. Nitrate Concentrations and Distribution

During this reporting period, nitrate concentrations in ground water remained high in the vicinity of the Buildings 832 and 830 source areas, and low or below the 0.5 mg/L reporting limit in the downgradient, deeper parts of all Building 832 Canyon HSUs. Concentration trends in the various HSUs are discussed below. Spatial and temporal nitrate concentration trends in all HSUs in the 832 Canyon OU continue to support the interpretation that nitrate is naturally attenuating in the ground water.

Qal/WBR HSU

During first semester 2016, nitrate in Qal/WBR HSU ground water ranged from a high of 150 mg/L in 832-SRC monitor well W-832-13 (February) to a low of 39 mg/L in down gradient

monitor well W-832-SC3 (March). Generally, nitrate concentrations in other wells followed this decreasing trend downgradient. Nitrate concentrations remained below the 0.5 mg/L reporting limit in guard wells W-880-02 and W-35B-01 located near the Site 300 boundary.

Tnsc_{1a/b} HSU

During first semester 2016, ground water nitrate concentrations in the Tnsc_{1a/b} HSU remained high but stable (between 17 and 150 mg/L) in the vicinity of the Buildings 830 and 832 source areas and continue to exhibit a significant decreasing trend downgradient towards the Site 300 boundary where the ground water is under confined hydraulic conditions. Since 2011, nitrate concentrations in the downgradient Tnsc_{1a/b} guard wells W-830-1730 and W-4C have not exceeded the 0.5 mg/L reporting limit.

Upper Tnbs₁ HSU

Historically, the highest nitrate concentration in the Upper Tnbs₁ HSU in the Building 832 Canyon OU was 21 mg/L in 1997 (monitor well W-830-28). The first semester 2016 maximum for the Buildings 830 and 832 areas was 5.8 mg/L (extraction well W-830-57), significantly below the 45 mg/L MCL cleanup standard. During first semester 2016, nitrate was not detected in guard wells W-830-15 or W-832-2112 above the reporting limit of 0.5 mg/L. The very low nitrate concentrations in the downgradient areas and the absence of detectable nitrate in the southern site boundary guard wells are consistent with the interpretation that nitrate is naturally attenuating due to *in situ* microbial denitrification in the Upper Tnbs₁ and other Neroly bedrock HSUs.

2.7.3.3. Building 832 Canyon OU Remediation Optimization Evaluation

During first semester 2016, ground water and soil vapor extraction wellfield operations continued in the Building 832 Canyon OU to prevent offsite plume migration, reduce source area concentrations, and remove contaminant mass. The expanded 832-SRC and 830-SRC extraction wellfields have increased hydraulic capture, while preventing the downward migration of contaminants into deeper HSUs and/or laterally toward the site boundary and Site 300 water-supply wells, Well 18 and Well 20. Ground water yield from many 830-SRC and 832-SRC extraction wells continues to be low and hydraulic capture is difficult to assess in some areas because these wells cannot maintain continuous operation. The low yields are due to a combination of geologic materials with low hydraulic conductivity, dewatering and limited recharge due to drought conditions.

Qal/WBR HSU

In the Qal/WBR and Tnsc_{1b} HSUs, the extraction wellfield targets the highest VOC plume concentrations emanating from the Building 832 and Building 830 source areas, but steep terrain and unstable canyon bottom soil conditions limit the availability of sites for new wells. Ground water extraction is further constrained by limited recharge and declining water levels in both source areas.

Tnsc_{1a/b} HSU

Active remediation of the Tnsc_{1a/b} HSU began in 2000 and the extraction wellfield currently consists of ten ground water extraction wells and four dual extraction wells. Water levels continue to decline in both the 830-SRC and 832-SRC areas, limiting continuous extraction from the Tnsc_{1b} and Tnsc_{1a} HSUs.

Total VOC concentrations in ground water at all Tnsc_{1a/b} extraction wells exhibit stable to decreasing trends since monitoring began at these locations except for W830-2214. Total VOC concentrations in ground water at extraction well W-830-2214 have increased from a historical low of 350 µg/L (2006) to a historical high of 1,202 µg/L (February 2016). Adjacent performance monitor wells W-830-2213 and W-830-21 both exhibit either stable or decreasing trends in total VOC concentrations and downgradient extraction well continues to exhibit stable VOC concentrations below 15 µg/L. This trend indicates the well capture zone is optimized and that we are pulling in the highest concentrations of the plume without any additional clean water. New extraction well W-830-2701 pumped at approximately 3 gpm at the start of the reporting period but has leveled off to approximately 1.5 gpm. Using W-830-2701 as an extraction well will increase hydraulic capture in the Tnsc_{1a} HSU downgradient of extraction well W-830-2214. An estimated capture zone for this well will be shown on 2016 Annual CMR maps.

As noted in Section 2.7.2, two monitor wells were installed to fulfill a recommendation made as part of the OU7 2011 Five-Year Review (Helmig et al., 2011). The two new wells, W-832-3209 and W-832-3210, specifically target the Tnsc_{1a} stratigraphic interval of the Tnsc_{1a/b} HSU. As discussed in Section 2.7.2, analytical results of baseline samples in these wells were within normal ranges in the Building 832 source area and these wells will offer good performance data for the surrounding extraction wells, W-832-01 and future extraction well W-832-3019.

Upper Tnbs₁ HSU

Extraction wells in the Upper Tnbs₁ target areas with the highest total VOC concentrations. Since remediation began in this HSU, the overall extent of VOCs has also decreased significantly and concentrations in monitor well W-830-1832 have been below the reporting limit since March 2010. Ground water in Upper Tnbs₁ guard wells W-830-15 and W-832-2112, located downgradient of well W-830-1832 and upgradient of water-supply Well 20, continues to show analytical results below reporting limits for all COCs and significantly below the 45 mg/L MCL cleanup standard for nitrate.

In October 2013, Upper Tnbs₁ monitor well W-832-2906 was installed downgradient of the 832-source area and to the north of extraction well W-830-57. Since installation, TCE has ranged between 4.9 µg/L (2015) and 12 µg/L (2013) in ground water in this well. Over the past year, the size of the VOC plume in the Upper Tnbs₁ HSU has remained relatively steady. The source of this contamination and its impact of the long-term performance of the cleanup remedy for the Building 832 Canyon OU are still being evaluated. An additional monitor well north of W-832-2906 was included as a recommendation in the 2016 OU7 Draft Second Five-Year Review for OU7 (McKaskey et al., 2016) to further delineate the extent of VOC contamination in this HSU.

Tnbs₂ HSU

In the Tnbs₂ HSU, Building 832 Canyon, remediation continues via extraction well W-830-2216. The source of contamination in this area is likely a combination of sources located in both the HEPA and the Building 832 Canyon area. Decreasing concentration trends in this extraction well and nearby monitor well W-830-13 suggest that remediation has been effective in removing mass in this area.

Mass Removal

In the Building 832-SRC area, concentration trends in extraction wells have remained stable for several years as declining water levels and low yields limit ground water extraction. In Building 832-SRC area, the volume of treated ground water increased from first semester 2015 (7,000 gallons) to first semester 2016 (32,000 gallons). This increase in ground water extracted reflects the more than two-fold increase in operational hours for the ground water system. The volume of treated soil vapor at 832 SRC similarly increased, from first semester 2015 (267,000 cg) to first semester 2016 (759,000 cf). Overall, since 2005, VOC mass removal rates from extracted soil vapor in the 832-SRC area have declined. The planned addition of dual extraction well W-832-3019 and other engineering upgrades and facility rebuild in the near future will increase mass removal rates in this area for both soil vapor and ground water. The additional data acquisition capabilities as part of these planned upgrades will provide data needed to better optimize mass removal in this area.

At the 830-SRC treatment facility, both ground water and soil vapor extraction play an important role in removing VOC mass. During first semester 2016, 1.4 million gallons of ground water were extracted. The volume of ground water treated at 830-SRC during first semester 2016 was the second highest volume from any six-month period at this facility. During first semester 2016, 490 g of VOCs, 0.9 g of perchlorate, and 62 kg of nitrate were removed from ground water in the 830-SRC area. This represents a significant increase from previous reporting periods, a direct result of recent upgrades facilitating less down time for maintenance, higher flow rates, and optimized controls for extraction wells, ensuring hydraulic capture of COC plumes in the different HSUs. During this reporting period, extraction well W-830-2215 remained offline due to a delay in the redevelopment of adjacent performance monitor well W-830-18. The redevelopment of this well and subsequent restart of extraction well W-830-2215 are scheduled for August 2016.

During first semester 2016, 1.8 million cf of soil vapor were treated at 830-SRC soil vapor treatment system. This represents a large increase from first semester 2015 (less than 1,000 cf) and is a result of the restarting of 830-SRC soil vapor treatment system after engineering upgrades were completed in late 2015. Upon restart of the system during first semester 2016, vapor samples were collected from wells W-830-1807 and W-830-49 to determine rebound of VOC concentrations in soil vapor during the extended shutdown for freeze protection. Results indicate significant rebound of total VOC concentrations in well W-830-49, from 3 ppm_{v/v} in October 2015 to 14 ppm_{v/v} in March 2016. Rebound of total VOC concentrations in W-830-1807 was also apparent but not as high, from 0.44 ppm_{v/v} in October 2015 to 2.3 ppm_{v/v} in March 2016. During October and November 2015, the mass flow meters at 830-SRC soil vapor treatment system had issues with condensate buildup resulting in inaccurate flow volumes. Soil vapor extraction from well W-830-1807, the offending well, has been temporarily suspended (while allowing ground water extraction to continue) until the condensate issues are fully addressed. During first semester 2016, at 830-SRC area, 180 g of total VOC mass were removed by the soil vapor treatment system.

At 830-DISS ground water treatment system, 6.1 g of VOC mass, 1.3 g of perchlorate mass, and 55 kg of nitrate mass were removed during first semester 2016. This is an increase from first semester 2015, but still less than in previous semesters due to lower operational hours of the 830-DISS ground water treatment facility for CGSA ground water treatment system engineering upgrades and modifications misting tower repairs.

As remediation proceeds from the 832-SRC, 830-SRC and 830-DISS extraction wells, it is expected that concentrations in all Building 832 Canyon HSUs will continue to decline and that declining water levels will have an impact on long term performance of extraction wells. VOC concentration trends in the Upper Tnbs₁ HSU continue to be monitored closely because of pumping of water-supply Well 20 and backup water-supply Well 18 has the potential to hydraulically influence the vertical distribution of contaminants. After Site 300 begins using the Hetch-Hetchy reservoir as its primary water supply, it is planned that Well 20 will become a backup water supply well and Well 18 will no longer be used and will be considered for decommissioning.

2.7.3.4. Building 832 Canyon OU Remedy Performance Issues

Declining water levels due to regional drought conditions continued to impact the amount of ground water available for extraction and treatment. No other new issues were identified during this reporting period that could impact the long-term performance of the cleanup remedy for the Building 832 Canyon OU. The remedy continues to make progress toward cleanup and to be protective of human health and of the environment.

2.8. Site 300 Site-Wide OU 8

The Site 300 Site-Wide OU is comprised of release sites at which no significant impacts to ground water and no unacceptable risk to human health or the environment are present. For this reason, a monitoring interim remedy was selected for the release sites in the Site-Wide Record of Decision (U.S. DOE, 2008). The monitoring conducted during the reporting period for these release sites is discussed below.

2.8.1. Building 801 and Pit 8 Landfill

The Building 801 Firing Table was used for explosives testing until it was discontinued in 1998, and the firing table gravel and some underlying soil were removed. Waste fluid discharges to the Building 801 Dry Well from the late 1950s to 1984, resulted in VOC contamination of the soil and ground water. Debris from the firing table was buried in the nearby Pit 8 Landfill until 1974. A map of the Building 801 and Pit 8 Landfill area showing the locations of the building, firing table, landfill, and monitor wells is presented on Figure 2.8-1.

2.8.1.1. Building 801 and Pit 8 Landfill Ground Water Monitoring

Wells K8-01, -02B, -03B, -04, and -05 monitor Building 801 for ground water contaminants that were released from the Building 801 dry well. Wells K8-02B, K8-04 and K8-05 are also used as monitor wells to detect releases from the Pit 8 Landfill. Detection monitoring of this landfill, which is discussed in Section 3.2, is conducted to determine if releases have occurred.

The sampling and analysis plan for ground water monitoring is presented in Table 2.8-1.

During the reporting period, all ground water monitoring was conducted in accordance with CMP monitoring requirements.

During first semester 2016 (in May), a new landfill detection monitor well, W-PIT8-3201 was drilled approximately 700 ft southeast of existing monitor well K8-02B and 800 ft southeast and downgradient of Pit 8. The purpose of this well was to fulfill a U.S. Department of Energy (DOE) recommendation in the First Five-Year Review of Operable Units (OUs) 3 and 8

(Buscheck et al., 2013). This recommendation was to install several monitor wells, including this new landfill detection monitor well downgradient and south of the Pit 8 Landfill, to ensure full detection monitoring capability under the range of ground water flow directions observed in the area since 1989. The well was screened in the Tnbs₁/Tnbs₀ HSU from 325 to 335 ft below ground surface (bgs) (Table 2-1). Initial baseline sampling was conducted in August (2016) and analytical results will be reported in the 2016 Annual CMR.

Details of the two other new landfill detection monitor wells in the Pit 8 area installed during the second semester 2016 to satisfy the Five-Year Review recommendation will be reported in the 2016 Annual CMR.

2.8.1.2. Building 801 and Pit 8 Landfill Contaminant Concentrations and Distribution

At Building 801, VOCs, comprised of chloroform, 1,2-DCA and TCE are the primary COCs detected in ground water; perchlorate and nitrate are the secondary COCs. There are no COCs in ground water attributable to the Pit 8 Landfill. The results of the detection monitoring of the Pit 8 Landfill are discussed in Section 3.2.

In the Building 801/Pit 8 Landfill area, five monitor wells are screened in the Tnbs₁/Tnbs₀ HSU. Wells K8-01, -02B, -03B and -04 were successfully sampled, as scheduled during first semester 2016. Well K8-05 has been dry since installation in 1988.

Total VOC concentrations in ground water in the vicinity of Building 801/Pit 8 Landfill have been relatively stable over time. In the Tnbs₁/Tnbs₀ HSU, total VOC concentrations have decreased from a historic maximum of 10 µg/L (monitor well K8-01, 1990) to a first semester 2016 maximum of 5.2 µg/L (same well, May) comprised of 3.5 µg/L TCE and 1.7 µg/L 1,2-DCA. These concentrations are well within the ranges observed since 1990.

Of the COCs, only 1,2-DCA was detected above its MCL cleanup standard (0.5 µg/L) during first semester 2016 in two wells, K8-01 (1.9 µg/L, May) and K8-04 (1.1 µg/L, May). TCE was not detected above its 5 µg/L MCL cleanup standard and chloroform was not detected in any wells above its 0.5 µg/L reporting limit. Overall, total VOC concentrations detected in ground water samples collected from wells downgradient of Building 801 have decreased since 1990.

During first semester 2016, perchlorate was not detected above the reporting limit of 4 µg/L in ground water samples from any Building 801/Pit 8 monitor wells.

Nitrate concentrations in ground water in the vicinity of Building 801/Pit 8 Landfill have been relatively stable over time. The first semester 2016 maximum nitrate concentration was 77 mg/L (K8-04, May). This historic maximum nitrate concentration was 80 mg/L detected in K8-04 in 2015. Nitrate has been detected within the range of 51 to 80 mg/L in this well since 2004.

Nitrate concentrations detected in other Pit 8 area wells did not exceed the 45 mg/L MCL cleanup standard during First Semester 2016. Nitrate concentrations detected in ground water during first semester 2016 at the Building 801/Pit 8 Landfill are generally similar to previous years.

Nitrate and 1,2-DCA are the only COCs remaining above their MCL cleanup standards at Building 801/Pit 8 Landfill.

2.8.2. Building 833

TCE was used as a heat-exchange fluid at Building 833 from 1959 to 1982 and was released through spills and rinse water disposal, resulting in TCE-contamination of soil and shallow perched ground water. A map showing the locations of the building and monitor wells is presented on Figure 2.8-2.

2.8.2.1. Building 833 Ground Water Monitoring

The sampling and analysis plan for ground water monitoring is presented in Table 2.8-2.

During the reporting period, ground water monitoring was conducted in accordance with CMP monitoring requirements with the following exceptions; a total of seven required analyses in seven different wells were not performed because the wells were dry or there was insufficient water to collect the samples.

2.8.2.2. Building 833 Contaminant Concentrations and Distribution

At Building 833, the VOCs TCE and cis-1,2-DCE are the primary COCs in ground water; there are no secondary COCs.

The Tpsg HSU is a shallow, highly ephemeral, perched water-bearing zone. During heavy rainfall events, this HSU may become saturated, but quarterly monitoring of the wells from 1993 to present has shown variable levels of saturation, including many wells that are now dry (W-833-03, -12, -18 -22, -28, -34 and -43). When saturated, monitoring conducted since 1988 has shown a significant decline in VOC concentrations in Tpsg HSU ground water compared to the highest levels, which were observed in the early 1990s.

In the Building 833 area, eight monitor wells are screened in the Tpsg HSU, two wells (W-833-30 and W-840-01) are screened in the deeper Lower Tnbs₁ HSU, and one well (W-841-01) is screened in the Upper Tnbs₁ HSU.

The historic maximum concentration of total VOCs measured in the Tpsg HSU in the Building 833 area is 2,100 µg/L (entirely TCE) detected in monitor well W-833-03 in 1992. This well has not been sampled, due to insufficient water, since June 2000, when 20 µg/L of total VOCs (entirely TCE), were detected. During first semester 2016, the only Tpsg HSU well with sufficient ground water to collect a sample was W-833-33 which yielded 110 µg/L total VOCs (entirely TCE, March). Recent total VOC results (entire TCE) for this well have been 130 µg/L (2015) and 110 µg/L (both 2014 and 2013). The historic maximum total VOC concentration detected in well W-833-33 was 170 µg/L (entirely TCE) in 2008.

The other primary COC, cis-1,2-DCE, was not detected in samples from any Building 833 area wells during first semester 2016. This compound has been detected only five times and most recently in 1993, only in one Building 833 well, W-833-12. The historic maximum cis-1,2-DCE concentration was 58 µg/L, detected in well W-833-12 in 1993.

During first semester 2016, VOCs were not detected in either routine or duplicate ground water samples collected in March from monitor well W-833-30, screened in the deeper Lower Tnbs₁ HSU, indicating that VOC contamination continues to be confined to the shallow Tpsg perched water-bearing zone.

TCE in Tpsg HSU ground water is the only COC remaining above its cleanup standard (5 µg/L) at Building 833.

2.8.3. Building 845 Firing Table and Pit 9 Landfill

The Building 845 Firing Table was used from 1958 until 1963 to conduct explosives experiments. Leaching from Building 845 Firing Table debris resulted in minor contamination of subsurface soil with depleted uranium and HMX detected in samples collected from boreholes drilled in 1989. A map showing the locations of the building, landfill, and monitor wells are presented on Figure 2.8-3.

2.8.3.1. Building 845 and Pit 9 Landfill Ground Water Monitoring

No ground water COCs have been identified for the Building 845/Pit 9 Landfill area. Wells K9-01 through K9-04 monitor ground water in the Building 845 and Pit 9 Landfill area to:

- Detect any future releases from the Pit 9 Landfill, and
- Detect any impacts to ground water from HMX and uranium in subsurface soil and rock.

These monitor wells are screened in the lower Neroly Formation Tnbs₁/Tnbs₀ HSU. Detection monitoring of the Pit 9 Landfill is discussed in Section 3.3.

The sampling and analysis plan for ground water monitoring is presented in Table 2.8-3.

During the reporting period, ground water monitoring was conducted in accordance with CMP monitoring requirements for this subarea with the following exceptions; a total of nine required analyses in well K9-03 were not performed due to an inoperable pump that is currently under investigation.

2.8.3.2. Building 845 and Pit 9 Landfill Contaminant Concentrations and Distribution

In the Building 845 and Pit 9 Landfill area, four landfill detection monitor wells are screened in the Tnbs₁/Tnbs₀ HSU.

There are no ground water COCs at the Building 845 and the Pit 9 Landfill. The detection monitoring constituents: VOCs, nitrate, tritium, perchlorate, HE compounds, uranium isotopes, Title 26 metals, lithium, and fluoride concentrations/activities in samples collected during first semester 2016 were either below reporting limits or within the range of background concentrations. Because uranium and the HE compound HMX were identified as COCs in subsurface soil at Building 845/Pit 9 Landfill, ground water in this area is monitored for these constituents.

During first semester 2016, HMX concentrations in ground water samples remained below the 1 µg/L reporting limit for wells K9-01, K9-02 and K9-04. Historically, HMX has not been detected above its reporting limit since the four area monitor wells were installed in 1989.

During first semester 2016, uranium activities in ground water samples remained very low (<1 pCi/L) and ²³⁵U/²³⁸U atom ratios indicated the presence of only natural uranium. The results of the detection monitoring of the Pit 9 Landfill are discussed in Section 3.2.

These first semester 2016 data continue to indicate no releases from the Pit 9 Landfill, nor impacts to ground water from HMX and uranium in subsurface soil.

2.8.4. Building 851 Firing Table

The Building 851 Firing Table has been used since 1962 to conduct explosives experiments. A map depicting the locations of the firing table and monitor wells is presented on Figure 2.8-4.

2.8.4.1. Building 851 Ground Water Monitoring

The sampling and analysis plan for ground water monitoring is presented in Table 2.8-4.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements for all wells in this subarea.

During first semester 2016 (in April and May), two new monitor wells, W-851-3207 and W-851-3208 were drilled in the Building 851 Firing Table area. Well W-851-3207 was located approximately 200 ft north of existing monitor well W-851-08, 300 ft south of existing well W-851-06 and 200 ft southeast of the Building 851 Firing Table. Well W-851-3208 was located approximately 250 ft southwest of existing monitor well W-851-05, 330 ft west-southwest of existing well W-851-06 and 50 ft west of the Building 851 Firing Table. The purpose of these wells was to fulfill a U.S. Department of Energy (DOE) recommendation in the First Five-Year Review of Operable Units (OUs) 3 and 8 (Buscheck et al., 2013). This recommendation was to install a monitor well downgradient and east (W-851-3207) and west (W-851-3208) of the Building 851 Firing Table to ensure full monitoring capability in all directions under the nearly flat ground water gradient observed in the area. Both new wells were screened in the Tmss HSU and screened from (1) 186 to 196 ft bgs for W-851-3207 and (2) 182-202 ft bgs for W-851-3208 (Table 2-1). Initial baseline sampling was conducted in July (2016) and analytical results will be reported in the 2016 Annual CMR.

2.8.4.2. Building 851 Contaminant Concentrations and Distribution

In the Building 851 Firing Table area, six monitor wells are screened in the Tmss HSU. Uranium is the primary and only COC detected in ground water; there are no secondary COCs. Two of these wells were recently installed during first semester 2016 but were not yet sampled, during first semester 2016.

Uranium activities in Tmss HSU ground water in the Building 851 Firing Table area have always been well below the 20 pCi/L MCL cleanup standard for total uranium and within the range of background levels. Although background uranium activity at Site 300 may vary based on ground water age, major-ion chemistry, and aquifer lithology, single-digit uranium activities are clearly within the range of Site 300 background. However, ground water continues to be monitored to detect any impacts to ground water from depleted uranium in surface soil and subsurface soil and rock.

During first semester 2016, the maximum total uranium activity detected in the Building 851 area was 1.1 pCi/L in well W-851-08 (May); in the past two years, this well yielded 1.2 (2015) and 1.1 pCi/L (2014) and the historic maximum uranium activity in this well was 2.06 pCi/L, observed in 1993. May samples from the three remaining wells contained uranium activities were that were less than 1 pCi/L or did not exceed the 0.0627 pCi/L reporting limit. The historic maximum uranium activity in Tmss HSU ground water was 3.2 pCi/L (well W-851-07, 1991); the first semester 2016 activity for this well was 0.120 pCi/L.

During first semester 2016, the atom ratio of $^{235}\text{U}/^{238}\text{U}$ in the May sample from well W-851-06 indicated the addition of some depleted uranium within the historical range of $^{235}\text{U}/^{238}\text{U}$ atom ratios observed for this well. However, the total uranium activity was 0.110 pCi/L, an extremely small fraction of 20 pCi/L, the MCL cleanup standard for uranium. The uranium atom ratio for the remaining three wells was natural. Overall, uranium activities in

ground water during first semester 2016 are similar to previous years and remain well below the 20 pCi/L MCL cleanup standard.

3. Detection Monitoring, Inspection, and Maintenance Program for the Pits 2, 3, 4, 5, 6, 7, 8, and 9 Landfills and Inspection and Maintenance Program for the Drainage Diversion System and Building 850 CAMU

The Detection Monitoring Program is designed to detect any future releases of contaminants from the Pit 2, 3, 4, 5, 6, 7, 8, and 9 Landfills. This section presents the results for ground water detection monitoring of these landfills, and any landfill inspections or maintenance conducted during the reporting period. This section also includes any inspection and maintenance activities conducted for the Pit 7 Drainage Diversion System and Building 850 CAMU during the reporting period.

3.1. Pit 2 Landfill

The Pit 2 Landfill was used from 1956 until 1960 to dispose of firing table debris from Buildings 801 and 802. Ground water data indicate that a past discharge of potable water to support a red-legged frog habitat located upgradient from the landfill may have leached depleted uranium from the buried waste. The frogs were relocated and the water discharge was discontinued, thereby removing the leaching mechanism. No contaminants were identified in surface or subsurface soil at the Pit 2 Landfill. No risk to human or ecological receptors has been identified at the Pit 2 Landfill.

3.1.1. Sampling and Analysis Plan Modifications

Detection monitoring of detection monitor wells located downgradient of the Pit 2 Landfill, is conducted annually for VOCs, nitrate, tritium, perchlorate, HE compounds, uranium isotopes, Title 26 metals, lithium, and fluoride. Detection monitoring wells for the Pit 2 Landfill include W-PIT2-1934, W-PIT2-1935, K2-01C and NC2-08.

The sampling and analysis plan for the Pit 2 Landfill ground water Detection Monitoring Program is presented in Table 3.1-1.

During the reporting period ground water monitoring was conducted in accordance with CMP monitoring requirements.

3.1.2. Contaminant Detection Monitoring Results

A map showing the locations of monitor wells and the Pit 2 Landfill is presented on Figure 2.5-1. Depth to ground water within the Tnbs₁/Tnbs₀ HSU beneath the Pit 2 Landfill currently ranges from over 50 ft to over 70 ft.

The maximum first semester 2016 tritium activity within the Tnbs₁/Tnbs₀ HSU in the area immediately south of the Pit 2 Landfill was 2,330 pCi/L in the May ground water sample collected from detection monitor well NC2-08. The historic maximum tritium activity of 49,100 pCi/L was detected in ground water samples collected from detection monitor wells

K2-01C, located approximately 100 feet northeast of well NC2-08, in 1986. Overall, tritium activities in the Pit 2 Landfill detection monitor wells are decreasing.

The maximum Pit 2 area first semester 2016 uranium activity of 5.1 pCi/L, considerably less than the 20 pCi/L MCL cleanup standard and within the range of natural uranium background, was detected in ground water collected from detection monitor well K2-01C. Uranium activities in the Pit 2 area continue to decrease from the 27.4 pCi/L maximum historic uranium activity measured in a 1994 ground water sample collected from well K2-01C. Prior to 2005, to maintain a wetland habitat for red-legged frogs (a Federally-listed endangered species) potable water was discharged within a drainage channel that extends south and along the northern and eastern margin of the Pit 2 Landfill. While this discharge occurred, increased uranium activities in wells in the Pit 2 area were observed and the $^{235}\text{U}/^{238}\text{U}$ atom ratios in ground water collected from wells K2-01C, W-PIT2-1934, and W-PIT2-1935 analyzed by mass spectrometry indicated the presence of depleted uranium. The release of depleted uranium from Pit 2 appears to have occurred during this time period as a result of this discharge. This discharge was discontinued in 2005 and since then, total uranium activities in ground water collected from the Pit 2 detection monitor wells have decreased and $^{235}\text{U}/^{238}\text{U}$ atom ratio data continue an increasing trend toward a natural $^{235}\text{U}/^{238}\text{U}$ atom ratio (approximately 0.0072). During first semester 2016, $^{235}\text{U}/^{238}\text{U}$ atom ratios in ground water collected from wells NC2-08 and W-PIT2-1935 indicated only natural uranium, and $^{235}\text{U}/^{238}\text{U}$ atom ratios in wells K2-01C and W-PIT2-1934 (0.0064 and 0.0067, respectively) indicated the presence of some depleted uranium, but continued an increasing trend toward a natural $^{235}\text{U}/^{238}\text{U}$ atom ratio.

During first semester 2016, perchlorate was not detected at concentrations exceeding the 4 $\mu\text{g}/\text{L}$ reporting limit in any of the Pit 2 detection monitor wells. In first semester 2015, perchlorate was detected just above the reporting limit in detection monitor well K2-01C at a concentration of 4.1 $\mu\text{g}/\text{L}$ (June).

Nitrate concentrations in samples collected from the Pit 2 detection monitor wells during first semester 2016 were all below the 45 mg/L MCL cleanup standard. In first semester 2015, nitrate was detected just above the 45 mg/L MCL cleanup standard in detection monitor well W-PIT2-1934 at 47 mg/L (May).

The other detection monitoring constituents: VOCs, HE compounds, Title 26 metals, lithium, and fluoride concentrations in samples collected during first semester 2016 were either below reporting limits or within the range of background concentrations.

There was no evidence of new contaminant releases from the Pit 2 Landfill indicated by the first semester 2016 ground water detection monitoring data.

3.1.3. Landfill Inspection Results

During first semester 2016, the Pit 2 Landfill was inspected on March 8 and April 5. No problems were identified.

3.1.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during second semester 2016.

3.1.5. Maintenance

No maintenance was necessary or conducted on Pit 2 during first semester 2016.

3.2. Pit 6 Landfill

The Pit 6 Landfill was used from 1964 to 1973 to bury waste in nine unlined debris trenches and animal pits, including shop and laboratory equipment and biomedical waste. The Pit 6 Landfill was capped and closed in 1997 to prevent further leaching of contaminants that likely resulted from percolation of rainwater through the buried waste. Detection monitoring of the Pit 6 Landfill is conducted to identify any future releases to ground water in accordance with the requirements of the Pit 6 Post-Closure Plan.

3.2.1. Sampling and Analysis Plan Modifications

Detection monitoring of wells located downgradient of the Pit 6 Landfill (EP6-06, EP6-08, EP6-09, K6-01S, K6-19 and K6-36) is conducted semi-annually for VOCs and tritium and annually for aromatic VOCs (benzene, toluene, ethylbenzene, and xylenes), beryllium, mercury, total uranium, gross alpha/beta, perchlorate, and nitrate. When detection monitor well K6-01S is dry, well K6-01 serves as an alternate detection monitor well and is sampled for the same constituents. Wells EP6-08 and K6-36 have been dry for the past several reporting periods. Beginning in 2013, nearby wells EP6-07 (near EP6-08) and K6-35 (near K6-36) were designated to serve as detection monitor wells and are sampled for the same constituents when EP6-08 and K6-35 are dry.

The sampling and analysis plan for the Pit 6 Landfill ground water Detection Monitoring Program is presented in Table 2.3-1.

During the reporting period, ground water monitoring was conducted in accordance with CMP monitoring requirements. Because wells EP6-08 and K6-36 were dry, wells EP6-07 (for EP6-08) and K6-35 (for K6-36) were successfully sampled for all the required semi-annual detection monitoring constituents that normally apply to EP6-08 and K6-36. Well K6-01S had available ground water for sampling and thus, well K6-01 was not needed to serve as an alternate detection monitor well.

3.2.2. Contaminant Detection Monitoring Results

A map showing the locations of monitor wells at the Pit 6 Landfill is presented on Figure 2.3-1. Analytical results for first semester 2016 are summarized in Table 2.3-2 and physical parameters measured during first semester 2016 sampling are included in Table 2.3-3. There was no evidence of a new contaminant release from the Pit 6 Landfill as indicated by the first semester 2016 ground water detection monitoring data.

With the exception of well EP6-07, data collected during the first semester 2016 did not differ significantly from the previous semester. Wells EP6-08 and K6-36 were once again dry and not sampled. Nearby wells EP6-07 and K6-35 did have available ground water and were sampled for the required detection monitoring constituents, effectively replacing EP6-08 and K6-36. Also, well K6-01S did contain ground water and was successfully sampled for the required detection monitoring constituents.

Tritium and VOCs that were released to ground water from the landfill prior to its capping in 1998 have been detected historically in Pit 6 Landfill detection monitor wells. Except for well EP6-07, tritium activities did not exceed statistical limits in ground water samples from any detection monitor wells during first semester 2016. In well EP6-07, tritium was detected at 255 ± 100 pCi/L (January), exceeding the statistical limit of 141 pCi/L. This activity level was

accompanied by a large analytical uncertainty and, therefore, is likely not indicative of an increasing trend in tritium activity. This well has exceeded the reporting limit of 100 pCi/L only three other times, since 1993, 313 pCi/L and 226 pCi/L (2003) and 600 pCi/L (1998). Tritium was also detected well K6-19 at 129 ±84.2 pCi/L (January) which did not exceed the statistical limit of 317 pCi/L. In 2015, this well yielded 132 ±58.0 pCi/L in July and was <100 pCi/L (reporting limit) for tritium in January. In 2014, well K6-19 yielded a maximum tritium activity of 150 ±89.1 pCi/L in the first quarter of the year; in the third quarter 2014, the tritium activity dropped to 120 ±66.0 pCi/L (duplicate sample) and <100 pCi/L (routine sample) collected the same time/day from this well. The statistical limit for tritium in well K6-19 was revised from 100 pCi/L to 317 pCi/L, following a statistical analysis conducted in September 2013. The first semester 2016 tritium detection of 129 ±84.2 pCi/L in this well is not considered to be indicative of a new release, especially given the large analytical uncertainty associated with the tritium measurement. Tritium activities in well K6-19 have dropped since October 1999 when the historic maximum activity of 2,520 pCi/L was detected. Since then, tritium activities have generally decreased (Campbell et al., 2007; Blake et al., 2011) and have always been well below the 20,000 pCi/L MCL cleanup standard.

During first semester 2016, no VOCs were detected in Pit 6 Landfill detection monitor wells above their applicable statistical limits. TCE was detected in EP6-09 in July at 4.5 µg/L (routine sample) and 4.7 µg/L (duplicate sample) below its MCL cleanup standard (5 µg/L) and far below its statistical limit of 17 µg/L, for this well. In January, K6-19 yielded TCE at 0.75 µg/L, far below MCL cleanup standard (5 µg/L) and far below its statistical limit of 13 µg/L, for this well. The historic maximum TCE concentration in Pit 6 monitor wells was 250 µg/L, detected in well K6-19 (1988). Further discussion of VOC distribution is presented in Section 2.3.2.1.1 of this CMR report.

Except for a small detection of cis-1,2-DCE in well K6-01S (2.1 µg/L, January) below its MCL cleanup standard (6 µg/L) and statistical limit for this well (7 µg/L), the other detection monitoring constituents in samples collected from the detection monitor wells during first semester 2016 did not exceed reporting limits.

There was no evidence of new contaminant releases from the Pit 6 Landfill indicated by the first semester 2016 ground water detection monitoring data.

3.2.3. Landfill Inspection Results

Abri Engineering conducted the Pit 6 Landfill Annual Engineering Inspection during first semester on April 21, 2016 (Abri Environmental Engineering, 2016a). Inspection results were summarized in a May 2016 engineering inspection report. Other than observing accumulation of some vegetative debris in the concrete lined drainage ditch, no problems were reported. Site 300 Labor Shop personnel subsequently removed the vegetative debris.

3.2.4. Annual Subsidence Monitoring Results

The annual subsidence monitoring inspection will be conducted during second semester 2016.

3.2.5. Maintenance

A post-closure visual maintenance inspection was performed by LLNL staff on April 5, 2016 and demonstrated the continued functional and structural integrity of the cap, vegetative cover, and drainage system.

3.3. Pit 8 Landfill

Pit 8 Landfill received debris from the Building 801 Firing Table until 1974, when it was covered with compacted soil. There is no evidence of contaminant releases from the landfill.

3.3.1. Sampling and Analysis Plan Modifications

Detection monitoring of detection monitor wells located downgradient of the Pit 8 Landfill, is conducted annually for VOCs, nitrate, tritium, perchlorate, HE compounds, uranium isotopes, Title 26 metals, lithium and fluoride. Detection monitoring wells for the Pit 8 Landfill include downgradient wells K8-02B, K8-04 and K8-05. Data from wells K8-01 and K8-03B that are located upgradient from the Pit 8 Landfill and downgradient of the Building 801 release site are also used for comparative purposes. As discussed in Section 2.8.1.2 of this document, during first semester 2016 (in May), a new landfill detection monitor well, W-PIT8-3201 was drilled approximately 700 feet southeast of existing monitor well K8-02B and 800 feet southeast and downgradient of Pit 8. The purpose of this well was to fulfill a U.S. Department of Energy (DOE) recommendation in the First Five-Year Review for Operable Units (OUs) 3 and 8 (Buscheck et al., 2013). Initial baseline sampling was conducted in August (2016) and analytical results will be reported in the 2016 Annual CMR. Details of the two other new landfill detection monitor wells in the Pit 8 area installed during the second semester 2016 to satisfy the Five-Year Review recommendation will be reported in the 2016 Annual CMR.

The sampling and analysis plan for the Pit 8 Landfill ground water Detection Monitoring Program is presented in Table 2.8-1.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements.

3.3.2. Contaminant Detection Monitoring Results

A map of the Building 801 Firing Table and Pit 8 Landfill showing building, firing table, landfill, and monitor well locations is presented as Figure 2.8-1.

Historic and current data indicate that VOCs detected in ground water in the Pit 8 Landfill area are the result of releases from the former Building 801D dry well, which have migrated downgradient from Building 801 to the area beneath the landfill. During first semester 2016, VOCs were detected in the ground water samples from all of the Pit 8 Landfill area wells, with the exception of K8-03B (no detections above the 0.5 µg/L reporting limit). The first semester 2016 maximum VOC concentration of 5.2 µg/L (comprised of 3.5 µg/L of TCE and 1.1 µg/L of 1,2-DCA) was detected in the May duplicate sample from well K8-01, located upgradient of Pit 8 and downgradient of Building 801 and historically containing the highest VOC concentrations. The historic maximum VOC concentration is 10 µg/L, detected four times in samples from well K8-01 between 1988 and 1990 (the most recent, collected February 9, 1990, was comprised of 6.0 µg/L of TCE and 4.0 µg/L 1,2-DCA). The presence of VOCs in the Pit 8

Landfill area wells appears to be a continuation of the VOC plume originating at the Building 801 dry well and is not indicative of a release from the Pit 8 Landfill.

Ground water nitrate concentrations in Pit 8 Landfill area wells K8-01 and K8-04 exceeded the 45 mg/L MCL cleanup standard during first semester 2016; the maximum first semester 2016 nitrate concentration was 77 mg/L in the May duplicate sample (the routine sample contained 71 mg/L) collected from downgradient detection monitor well K8-04. The historic maximum Pit 8 Landfill area nitrate concentration of 80 mg/L was detected in first semester 2015 in K8-04. Nitrate concentrations in well K8-01 were 45 mg/L in the routine sample and 36 mg/L in the duplicate sample. Overall, these nitrate results are similar to historical results, and are not indicative of a new release from the Pit 8 Landfill.

The maximum first semester 2016 tritium activity detected in ground water collected from wells in the Pit 8 Landfill area was 227 ± 77.0 pCi/L in the May duplicate sample from well K8-01. The routine and duplicate samples collected in May from well K8-01 contained tritium with activities greater than the 100 pCi/L reporting limit. During first semester 2016, tritium activities in the other wells in the Pit 8 Landfill area were below the reporting limit. When the error of measurement is considered, the tritium activities detected in ground water samples from well K8-01 are slightly higher than background. Because well K8-01 is located upgradient of the Pit 8 Landfill, tritium detections above the reporting limit are not indicative of a new release from the Pit 8 Landfill, but from an upgradient source such as the Building 850 firing table.

During first semester 2016, perchlorate concentrations in Pit 8 Landfill area wells did not exceed the 4 μ g/L reporting limit.

The other detection monitoring constituents: HE compounds, uranium isotopes, Title 26 metals, lithium, and fluoride concentrations/activities in samples collected during first semester 2016 from wells upgradient/cross-gradient and downgradient of the Pit 8 Landfill were either below the cleanup standards, the reporting limits, or within the range of background concentrations.

Of the constituents monitored during first semester 2016 as part of the Detection Monitoring Program in Tnbs₁/Tnbs₀ HSU ground water from Pit 8 Landfill area wells, only nitrate and 1,2-DCA exceeded their applicable MCL cleanup standards.

There was no evidence of a new contaminant release from the Pit 8 Landfill indicated by the first semester 2016 ground water detection monitoring data.

3.3.3. Landfill Inspection Results

During first semester 2016, the Pit 8 Landfill was inspected on March 8 and April 5. No problems were identified.

3.3.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during second semester 2016.

3.3.5. Maintenance

No maintenance was necessary at Pit 8 during first semester 2016.

3.4. Pit 9 Landfill

Debris generated at the Building 845 Firing Table was buried in the Pit 9 Landfill from 1958 until 1963. There has been no evidence of contaminant releases from the Pit 9 Landfill.

3.4.1. Sampling and Analysis Plan Modifications

Detection monitoring is conducted in wells located downgradient of the Pit 9 Landfill annually for VOCs, nitrate, tritium, perchlorate, HE compounds, uranium isotopes, Title 26 metals, lithium and fluoride. Detection monitoring wells for the Pit 9 Landfill include K9-01, K9-02, K9-03 and K9-04.

The sampling and analysis plan for the Pit 9 Landfill ground water Detection Monitoring Program is presented in Table 2.8-3.

During the reporting period, ground water monitoring was conducted in accordance with CMP monitoring requirements with the following exceptions: nine required analyses were not performed due to an inoperable pump in K9-03.

3.4.2. Contaminant Detection Monitoring Results

A Building 845 Firing Table and Pit 9 Landfill site map showing building, landfill, and monitor well locations is presented as Figure 2.8-3. The detection monitoring constituents: VOCs, nitrate, tritium, perchlorate, HE compounds, uranium isotopes, Title 26 metals, lithium and fluoride concentrations/activities in samples collected during first semester 2016 were either below reporting limits or within the range of background concentrations. There was no evidence of a new release from the Pit 9 Landfill during first semester 2016.

3.4.3. Landfill Inspection Results

During first semester 2016, the Pit 9 Landfill was inspected on March 8 and April 5. No problems were identified.

3.4.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during second semester 2016.

3.4.5. Maintenance

No maintenance was necessary at Pit 9 during first semester 2016.

3.5. Pit 7 Complex Landfills

The Pit 3, 4, 5, and 7 Landfills are collectively designated the Pit 7 Landfill Complex. Firing table debris containing tritium, depleted uranium, and metals was placed in the pits in the 1950s through the 1980s. The Pit 4 and 7 Landfills, and about 25-30% of Pit 3, were capped in 1992. During years of above-normal rainfall (e.g., 1997-1998 El Niño), ground water rose into the bottom of the landfills and the underlying contaminated bedrock. This resulted in the release of tritium, uranium, VOCs, perchlorate and nitrate to ground water. In addition to these COCs, ground water samples from Pit 7 Complex detection monitor wells are also analyzed for metals, HE compounds, and PCBs as these constituents may have been contained in the firing table gravels placed in the landfills.

3.5.1. Sampling and Analysis Plan Modifications

Detection monitoring is conducted in wells located downgradient of the Pit 7 Landfill Complex annually for VOCs, nitrate, tritium, perchlorate, HE compounds, uranium isotopes, Title 26 metals, lithium, fluoride and PCBs.

The sampling and analysis plan for the Pit 7 Complex Landfill ground water Detection Monitoring Program is presented in Table 2.5-8.

During the reporting period, ground water monitoring was conducted in accordance with CMP monitoring requirements.

3.5.2. Contaminant Detection Monitoring Results

A map showing the locations of detection monitor wells and the Pit 7 Complex Landfill is presented on Figure 2.5-1. Wells K7-01, K7-03, K7-06, K7-09, K7-10, NC7-26, NC7-47 and NC7-48 comprise the current detection monitoring well network for the Pit 7 Complex. Wells K7-01, K7-03 and NC7-26 are located downgradient of Pit 5 and Pit 7; well K7-06 is upgradient of Pit 7, wells K7-09 and K7-10 are cross-gradient of Pits 3, 5 and 7; well NC7-48 is immediately downgradient of Pit 7, and well NC7-47 is far downgradient of Pits 3 and 7.

The detection monitor wells are screened in the following HSUs:

- NC7-48: Qal/WBR HSU.
- K7-01 and K7-06: Qal/WBR and Tnbs₁/Tnbs₀ HSUs.
- K7-03, K7-10, NC7-26 and NC7-47: Tnbs₁/Tnbs₀ HSU.
- K7-09: Tnsc₀ HSU.

Depth to ground water is currently a minimum of 10 to 15 ft below the buried waste in Landfill Pits 3, 4, 5 and 7.

3.5.2.1. Tritium

The Pit 3 and 5 Landfills have been identified as the sources of previous releases of tritium to ground water. The Pit 7 Landfill is not an apparent source of tritium in ground water as most of the tritium-bearing experiments conducted at Site 300 occurred prior to its opening in 1979 (Taffet et al., 2008).

During first semester 2016, tritium activities in routine and duplicate ground water samples collected from Pit 7 Complex detection monitor wells K7-01 and K7-03 in April exceeded the 20,000 pCi/L MCL cleanup standard with maximum activities of 28,400 pCi/L and 55,700 pCi/L, respectively. Tritium activities in ground water samples from detection monitor well K7-01 have decreased from the historic maximum activity of 72,900 pCi/L in October 1999. The first semester 2016 maximum tritium activity detected in a ground water sample from this well was 31,000 pCi/L (April). Tritium activities in ground water samples from well K7-03 have generally been declining since the historic maximum activity 216,000 pCi/L in March 1993. The maximum first semester 2015 ground water tritium activity in K7-03 was 56,900 pCi/L (April).

Tritium activities in all samples collected during first semester 2016 from upgradient well K7-06, cross-gradient wells K7-09 and K7-10, and far downgradient well NC7-47 were all below the 100 pCi/L reporting limit/background activity.

In general, the extent of tritium in the Tnbs₁/Tnbs₀ and Qal/WBR HSUs in the Pit 7 Complex area are consistent with those observed in first semester 2015, and tritium activities continue to decrease. No new release of tritium from the landfills is indicated by the first semester 2016 ground water tritium data.

A discussion of tritium previously released to ground water from the Pit 7 Complex Landfills is presented in Section 2.5.5.2.1.

3.5.2.2. Uranium

Depleted uranium was previously released to ground water from sources in Pits 3, 5 and 7 (Taffet et al., 2008). Uranium activities were below the 20 pCi/L MCL cleanup standard in all detection monitor well samples collected during first semester 2016. The maximum first semester 2016 uranium activity in a sample from a detection monitor well was 15 pCi/L from well K7-01. Uranium activities in ground water samples from this well have generally fluctuated within a few pCi/L of the 20 pCi/L MCL cleanup standard since the 1997-1998 El Niño. The historic maximum uranium activity detected in this well was 27 pCi/L (September 1984).

The uranium activity in well NC7-48, the only detection monitor well containing depleted uranium, was 10.0 pCi/L. Uranium activities in this well have declined from the historic maximum of 105 pCi/L detected after the 1997-98 El Niño (March 1998). Ground water samples from this well have historically contained depleted uranium.

The extent of uranium in Qal/WBR and Tnbs₁/Tnbs₀ ground water is similar to recent years and uranium activities in samples from all detection monitor wells have generally decreased from their historic maximum uranium activities. Ground water uranium data from first semester 2016 do not indicate any new releases of uranium from the Pit 7 Complex Landfills. A discussion of uranium that was previously released to ground water from the Pit 7 Complex Landfills is presented in Section 2.5.5.2.2.

3.5.2.3. Nitrate

Ground water samples collected during first semester 2016 from Pit 7 Complex detection monitor wells K7-01 and NC7-47 exceeded the 45 mg/L MCL cleanup standard at concentrations of 56 mg/L and 65 mg/L, respectively. Ground water samples from well NC7-47 have never contained any other COCs in excess of background concentrations. Overall, nitrate concentrations in the detection monitoring wells have remained stable, with occasional fluctuations, for the last decade. Current data do not indicate any new releases of nitrate from any of the landfills. A discussion of nitrate previously released to ground water from the Pit 7 Complex Landfills is presented in Section 2.5.5.2.3.

3.5.2.4. Perchlorate

Wells K7-01 (screened in the Qal/WBR and Tnbs₁/Tnbs₀ HSUs) and K7-03 (screened in the Tnbs₁/Tnbs₀ HSU) are the only detection monitor wells from which ground water samples have historically contained perchlorate at concentrations in excess of the 4 µg/L reporting limit. Perchlorate concentrations in samples from these wells have decreased from the historic maximum of 25 µg/L at well K7-01 (July 2006) and 29 µg/L at well K7-03 (April 2005) to first semester 2016 concentrations of 7.9 µg/L (April) and 4.8 µg/L (April duplicate sample result, routine sample result was 4.3 µg/L), respectively. The overall extent of perchlorate at concentrations exceeding the 6 µg/L MCL cleanup standard in ground water in the Pit 7

Complex area did not change significantly from first semester 2015 to first semester 2016. The first semester 2016 data do not indicate any new releases of perchlorate from any of the landfills. A discussion of perchlorate previously released to ground water from the Pit 7 Complex landfills is presented in Section 2.5.5.2.4.

3.5.2.5. Volatile Organic Compounds

During first semester 2016, VOCs were detected in samples from two detection monitor wells at concentrations above reporting limits. The samples from wells K7-01 and K7-03 contained 0.59 µg/L and 0.97 µg/L of TCE, respectively. The historic maximum VOC concentrations in samples from these wells were 20 µg/L (well K7-01, 1985) and 15.2 µg/L (well K7-03, 1985). VOC concentrations have generally been declining in samples from these wells since these 1985 maxima. The first semester 2016 data do not indicate any new releases of VOCs from any of the landfills. A discussion of VOCs previously released to ground water from the Pit 7 Complex Landfills is presented in Section 2.5.5.2.5.

3.5.2.6. Title 26 Metals and Lithium

During first semester 2016, Title 26 metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium and zinc) and lithium were not detected in ground water samples from the Pit 7 Complex area detection monitoring wells at concentrations in excess of background concentrations. These data did not indicate a release of metals from any of the landfills during reporting period.

3.5.2.7. High Explosives (HE) Compounds

During first semester 2016, HE compounds were not detected in ground water samples from the Pit 7 Complex area detection monitoring wells at concentrations in excess of individual compound detection limits of 1 to 2.5 µg/L. These data did not indicate a release of HE compounds from any of the landfills during first semester 2016.

3.5.2.8. Polychlorinated Biphenyls (PCBs)

During first semester 2016, PCB compounds were not detected in ground water samples from the Pit 7 Complex area detection monitoring wells at concentrations in excess of the individual compound detection limits of approximately 0.5 µg/L. The data indicate no release of PCBs from any of the landfills during the reporting period.

3.5.3. Landfill Inspection Results

Abri Engineering conducted the Pit 7 Landfill Cap Annual Engineering Inspection during first semester on April 21, 2016 (Abri Environmental Engineering, 2016b). Inspection results were summarized in a May 2016 engineering inspection report. Other than observing some cracks in the joints in the drainage system and burrowing animal holes, no problems were reported. The holes were repaired during the inspection.

3.5.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during second semester 2016.

3.5.5. Maintenance

No maintenance was required at Pit 7 during first semester 2016.

3.6. Pit 7 Complex Drainage Diversion System

A Drainage Diversion System was constructed in the Pit 7 Complex area of OU 5 in 2007-2008 (Section 2.6). The Pit 7 Drainage Diversion System is inspected and maintained per the requirements of the Inspection and Maintenance Plan (Taffet et al., 2008).

3.6.1. Drainage Diversion System Inspection Results

Monthly rainy season inspections were performed during first semester 2016. The drainage diversion system was inspected on January 15, February 15, March 15, and April 15.

3.6.2. Drainage Diversion System Maintenance

Vegetative debris was removed from basins, channels and rip-rap areas during first semester 2016.

3.7. Building 850 CAMU

A CAMU was constructed in the Building 850 area of OU 5 in 2009 as part of the Building 850 Removal Action (Section 2.5). The Building 850 CAMU is inspected and maintained per the requirements of the Inspection and Maintenance Plan (SCS Engineers, 2010).

3.7.1. Building 850 CAMU Inspection Results

During first semester 2016, the CAMU was inspected on January 7, January 19, March 8, March 14, April 11, and May 9, immediately following rainfall events. No evidence of excess vegetation, erosion, or sedimentation was observed and all controls were working as intended. CAMU inspections are typically conducted during second semester in July (post-season), immediately after major storms, and October (pre-season). The results of these inspections will be documented in the 2016 Annual CMR.

3.7.2. Building 850 CAMU Maintenance

Maintenance was not required during first semester 2016.

4. Risk and Hazard Management Program

The goal of the Site 300 Risk and Hazard Management Program is to protect human health and the environment by controlling exposure to contaminants during remediation. Risk and hazard management is conducted in areas of Site 300 where the exposure point risk exceeded 1×10^{-6} or the hazard index exceeded 1 in the baseline risk assessment. Institutional controls have been implemented to manage risks. The CMP/CP requires that the institution controls in place at Site 300 be evaluated annually. Per the CMP/CP requirements, the results of the 2016 human health risk and hazard re-evaluation will be discussed in detail, in the 2016 Annual CMR:

- Inhalation risk evaluation for VOCs migrating from subsurface soil into indoor ambient air in Buildings 830 and 834D.
- Inhalation risk evaluation for VOCs migrating from surface water into outdoor ambient air at Springs 5 and 7 and for tritium at Well 8 Spring.

The completed Institutional Controls Monitoring Checklist for 2016 will be included in the Annual CMR.

Per the CMP/CP requirements, the results of the following 2016 ecological risk and hazard management program will be discussed in the 2016 Annual CMR:

- Inspections of the Pit 7 Complex landfills and burrow/hole filling in the cover to prevent unacceptable exposure of animals to uranium in the pit waste.
- Evaluation of any new biological survey information collected during 2016 for the presence of new special-status species.
- Additional sampling for total phosphorus and ammonia nitrogen in Spring 4, chloride in Spring 14, and total uranium in Springs 10, 11, and 16 when/if sufficient water is available for sampling.

The results of the most recent (2015) human health and ecological risk and hazard re-evaluation are presented in the 2015 Annual CMR (Buscheck and Ferry, 2016).

5. Data Management Program

The management of data collected during first semester 2016 was subject to Environmental Restoration Department (ERD) data management process and standard operating procedures (Goodrich and Lorega, 2012). This data management process tracks sample and analytical information from initial sampling plan through data storage in a relational database. As part of the standard operating procedures for data quality, this process includes sample planning, chain of custody tracking, sample collection history, electronic and hard copy analytical results receipt, strict data validation and verification, data quality control procedures, and data retrieval and presentation. Data management and data retrieval is facilitated by a web-based system known as The Environmental Information Management System (TEIMS). The use of this system promotes and provides a consistent data set of known quality. Quality assurance and quality control are performed consistently on all data.

5.1. Modifications to Existing Procedures

The relational database used to maintain the data for the CMR continued to be Oracle version 11.2.0.3 on Linux servers. General maintenance and refinements continued in both the database and the web application programming. Improvements and additions to the ERD data management process are continuously implemented in an ongoing effort to automate and upgrade the applications, including updating and adding verifications, improving the system that monitor well maintenance tickets, and refining the recently improved water level collection process to use a mobile application for collection. Another change was the addition of ability to track deliverables with short turn around time necessary to improve invoicing.

5.2. New Procedures

The process of re-architecting existing computer programs that generate web pages continues, with the dual goals of improving maintainability and user efficiency. Foundational infrastructure code is being updated from the programming language Perl to Python.

6. Quality Assurance/Quality Control Program

LLNL conducted all compliance monitoring in accordance with the approved Quality Assurance Project Plan (QAPP) (Dibley, 1999) requirements for planning, performing, documenting, and verifying the quality of activities and data. The QAPP was prepared for CERCLA compliance and ensures that the precision, accuracy, completeness, and representativeness of project data are known and are of acceptable quality. The QAPP is used in conjunction with the LLNL ERD Standard Operating Procedures (SOPs), Operations and Maintenance Manuals (O&Ms), Work Plans, Sampling Plans, Integration Work Sheets (IWSs), and Site Safety Plans. Modifications to existing LLNL ERD quality assurance/quality control (QA/QC) procedures, new QA/QC procedures that were implemented during this reporting period, self-assessments, work planning and control, quality issues and corrective actions, analytical and field quality control, and contract analytical laboratory services are discussed in this section.

6.1. Modifications to Existing Procedures

Revision 15 of the LLNL ERD SOPs was released in February 2016. The following 22 SOPs completed the review and update process and were approved for release in Revision 15:

- SOP 1.2 Borehole Sampling of Unconsolidated Sediments and Rock
- SOP 1.5: Initial Well Development
- SOP 2.1: Pre-sample Purging of Wells.
- SOP 2.2: Field Measurements on Surface and Ground Waters.
- SOP 2.3: Sampling Monitor Wells with Electric Submersible Pumps, and Specific-Depth Grab Sampling Devices.
- SOP 2.4: Sampling Monitor Wells with a Bailer.
- SOP 2.5: Surface Water Sampling.
- SOP 2.6: Sampling for Volatile Organic Compounds.
- SOP 2.7: Pre-sample Purging and Sampling of Low-Yielding Monitor Wells.
- SOP 2.9: Sampling for Tritium in Ground Water.
- SOP 2.10: Well Disinfection and Coliform Bacteria Sampling.
- SOP 4.3: Sample Containers and Preservation.
- SOP 4.7A: Livermore Site Treatment and Disposal of Well Development and Well Purge Fluids.
- SOP 4.10: Records Management.

- SOP 5.1: Data Management Chain of Custody and Printed Analytical Result Receipt and Processing.
- SOP 5.3: Data Management Electronic Analytical Result Receipt and Processing for Sample, Analysis, and QC Data.
- SOP 5.4: Data Management Hand Entry of Analytical Results.
- SOP 5.5: Data Management Revision Receipt and Processing.
- SOP 5.8: Field Logbook Control.
- SOP 5.10: Data Management Receipt and Processing Lithology by Electronic Transfer.
- SOP 5.15: Preparation of Required Routine Ground Water and Treatment Facilities Sampling Plans.
- SOP 5.20: Cost Effective Sampling (CES) Algorithm Preparation.

The following SOPs remain in the review and update process:

- SOP 1.8: Disposal of Investigation-Derived Wastes (Drill Cuttings, Core Samples, and Drilling Mud), Revision 3, 1999.
- SOP 1.14: Final Well Development/Specific Capacity Tests at LLNL Livermore Site and Site 300, Revision 2, 2006.
- SOP 2.8: Installation of Dedicated Sampling Devices, Revision 5, 2003.
- SOP 3.1: Water-Level Measurements, Revision 7, 2006.
- SOP 3.2: Pressure Transducer Field Calibration, Revision 3, 2003.
- SOP 3.3: Hydraulic Testing (Slug/Bail), Revision 3, 2003.
- SOP 3.4: Hydraulic Testing (Pumping), Revision 3, 2003.
- SOP 4.14: Mapping with the Trimble Pathfinder Pro XR GPS System, Revision 0, 1999.

6.2. New Procedures

Revision 15 of the LLNL ERD SOPs includes three new procedures:

- SOP 1.18: Site 300 Treatment Media Acceptance Testing and Usage Tracking Process.
- SOP 1.19: Conditioning Treatment for Ion Exchange Resin.
- SOP 1.20: Carbon Canister Removal and Carbon Conditioning.

6.3. Self-assessments

ERD participates in self-assessments, both formal and informal. Assessments are conducted to evaluate work activities to procedural, QA, management, and Integrated Safety Management System (ISMS) practices. External regulatory agencies and management performs frequent assessments and management work observations, verifications, and inspections (MOVIs) of ERD work activities. There were a total of 20 assessments consisting of MOVIs, Storm Water Pollution Prevention Program (SWPPP) and regulatory inspections conducted for the Site 300 CERCLA program during first semester 2016. Issues and deficiencies observed during assessments are tracked from inception to resolution using the institutional Issues Tracking System (ITS). There were no deficiencies associated with the assessments performed for the

Site 300 program during this reporting period. Findings and observations noted during contract analytical laboratory audits are managed through the DOECAP system.

6.4. Work Planning and Control

The Institutional-Wide Work Planning and Control (WP&C) process is undergoing a major overhaul. A key component of the new process is that it will be a risk-based approach and will replace the current IWS system. LLNL continues to use the existing IWS system while the new WP&C process is underway.

The periodic scheduled reviews for the IWSs required under the current WP&C process are in progress for the ERD Site 300 IWSs.

6.5. Quality Issues and Corrective Actions

Quality improvement, nonconformance, and corrective action reporting is documented using the Quality Improvement Form (QIF).

One QIF was submitted during first semester 2016. QIF-16-001 was developed to avoid the misplacement of COCs by BC Labs. Samples were analyzed out of hold time due to a misplaced COC that delayed the sample login process. The corrective action calls for all LLNL COCs to be held in a designated tray and for a secondary reviewer to confirm that all COCs are accounted for. The QIF was approved, successfully implemented, and closed out.

6.6. Analytical Quality Control

Data review, validation, and verification are conducted on 100% of the incoming analytical data in accordance with ERD SOP 4.6: Validation and Verification of Radiological and Nonradiological Data Generated by Analytical Laboratories. Contract analytical laboratories are contractually required to provide internal QC checks in the form of method blanks, laboratory control samples, matrix spikes, and matrix spike or sample duplicate results with every analysis. During the data validation process, the analytical QC data and associated QC acceptance criteria (control limits) are reviewed. Data qualifier flags are assigned to analytical data that fall outside the QC acceptance criteria. Data qualifier flags and their definitions are listed in the Acronyms and Abbreviations in the Tables section of this report. The qualifier flags, when they exist, appear next to the analytical data presented in the treatment facility compliance tables of this report. Because rejected data are not used for decision-making, the rejected analytical data are not displayed in the tables, only the “R” flag is presented. Data are qualified as rejected only when there is a serious deficiency in the ability to analyze the sample and meet QC criteria. There were no off normal occurrences to report in relation to data validation and verification performed this semester other than what was addressed by the QIF described above.

6.7. Field Quality Control

During the first semester 2016 reporting period, there were no problems with field QC samples to report.

6.8. Contract Analytical Laboratory Services

During February 2016, the computer systems of Test America laboratories experienced a cyber attack. Test America laboratories were unable to receive or analyze samples for several days while the virus was quarantined and contained. Once their systems were back online, Test America reported that no client data had been compromised. During this time period, ERD samples scheduled for analysis by Test America were re-routed to BC Laboratories. Due to this event, LLNL began the process of getting a third environmental analytical laboratory under contract. A contract with Caltest became effective April 1, 2016. BC Laboratories and Test America remain the primary laboratories with Caltest available as a QC lab only.

During first semester 2016, two of the environmental analytical laboratories under contract with LLNL, GEL Laboratories and BC Laboratories, were audited. Department of Energy Consolidated Audit Program (DOECAP) audits were performed at GEL Laboratories and BC Laboratories during April and May 2016, respectively. All previous audit findings, with the exception of one for BC Laboratories, were closed. Findings and observations noted during contract analytical laboratory audits are managed through the DOECAP system. There were several new findings reported, but overall, it was determined that both labs are technically sound and producing quality data.

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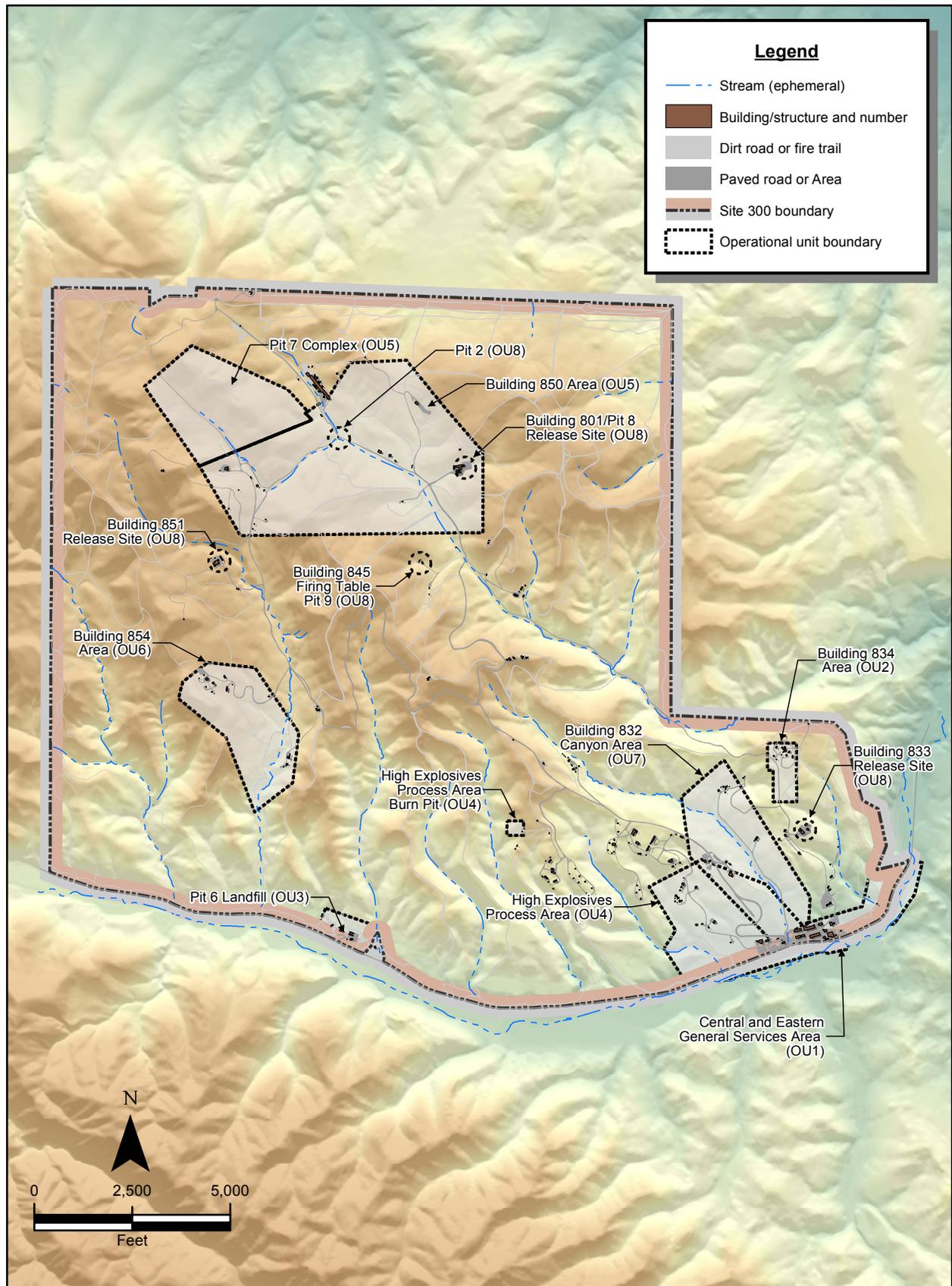


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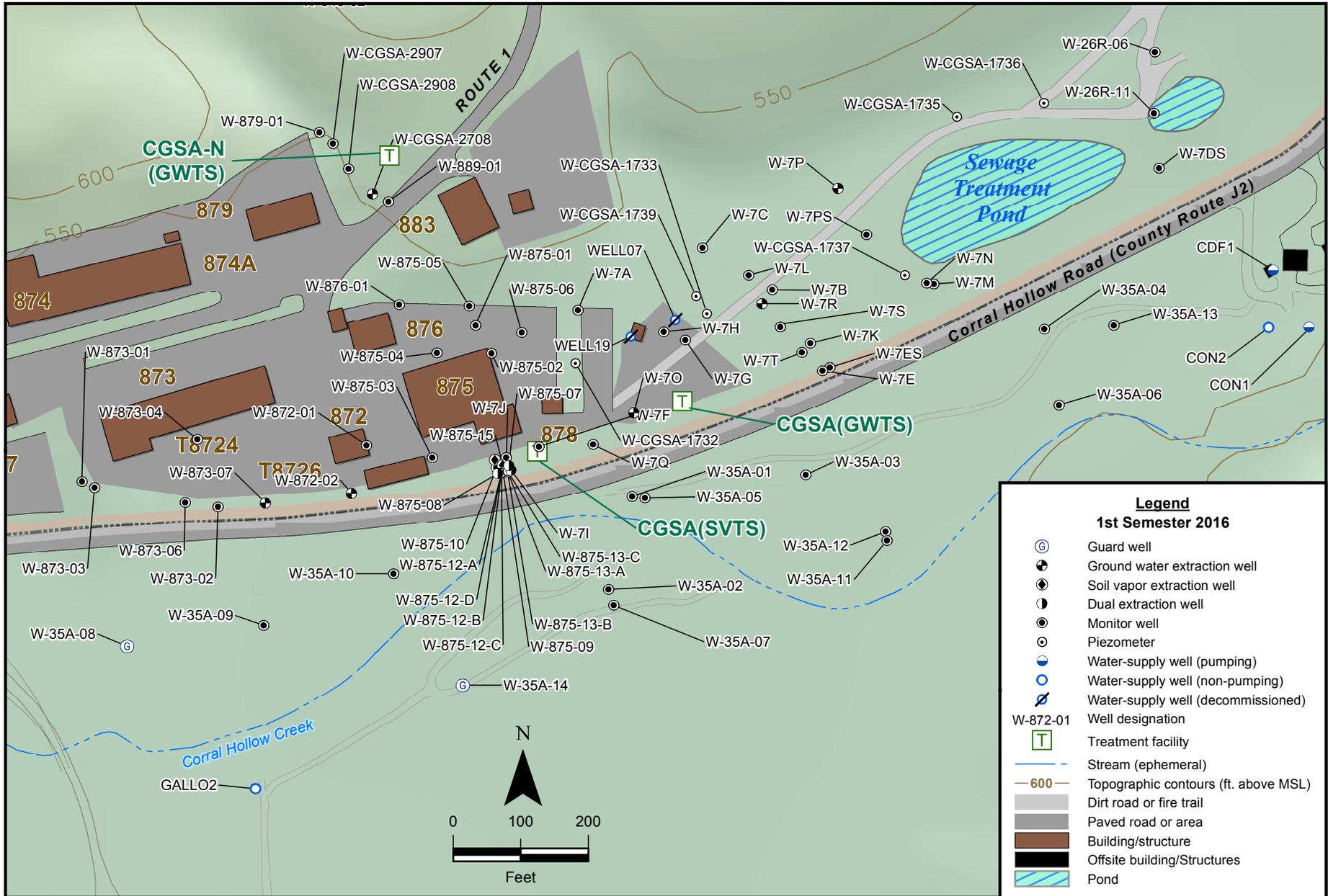


Figure 2.1-1. Central General Services Area Operable Unit site map showing monitor, extraction and water-supply wells, and treatment facilities.

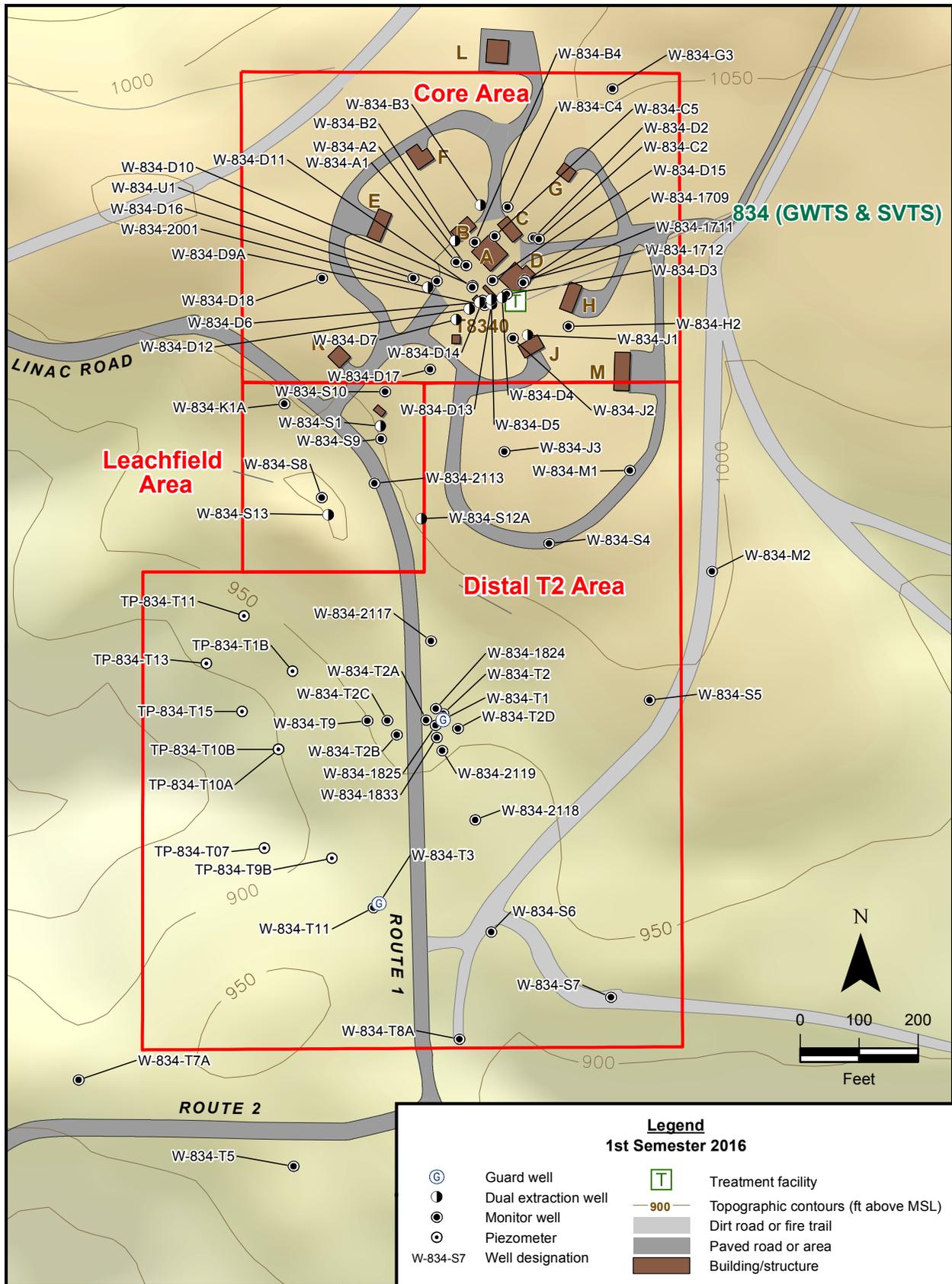


Figure 2.2-1. Building 834 Operable Unit site map showing monitor and extraction wells, and treatment facilities.

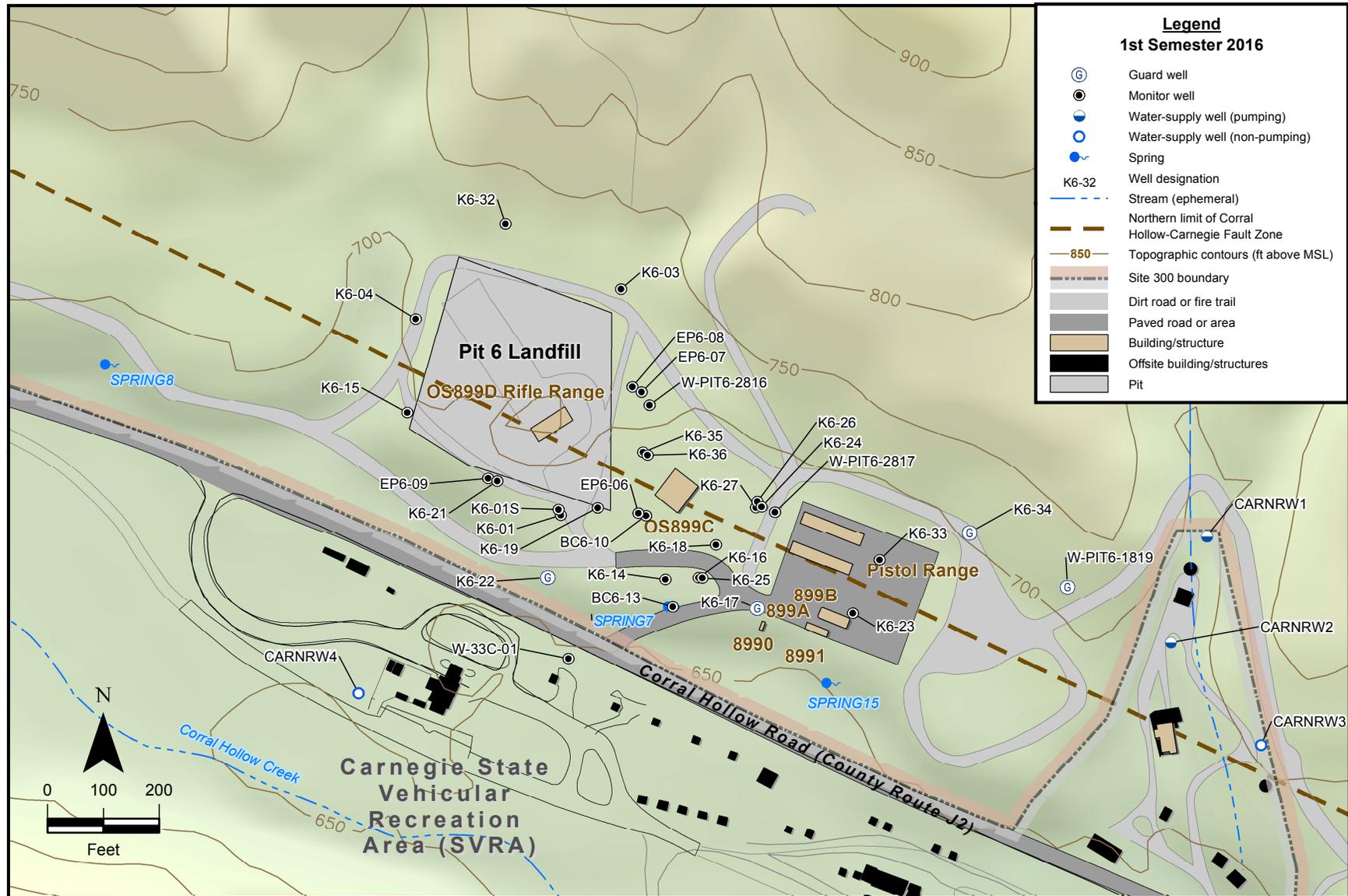


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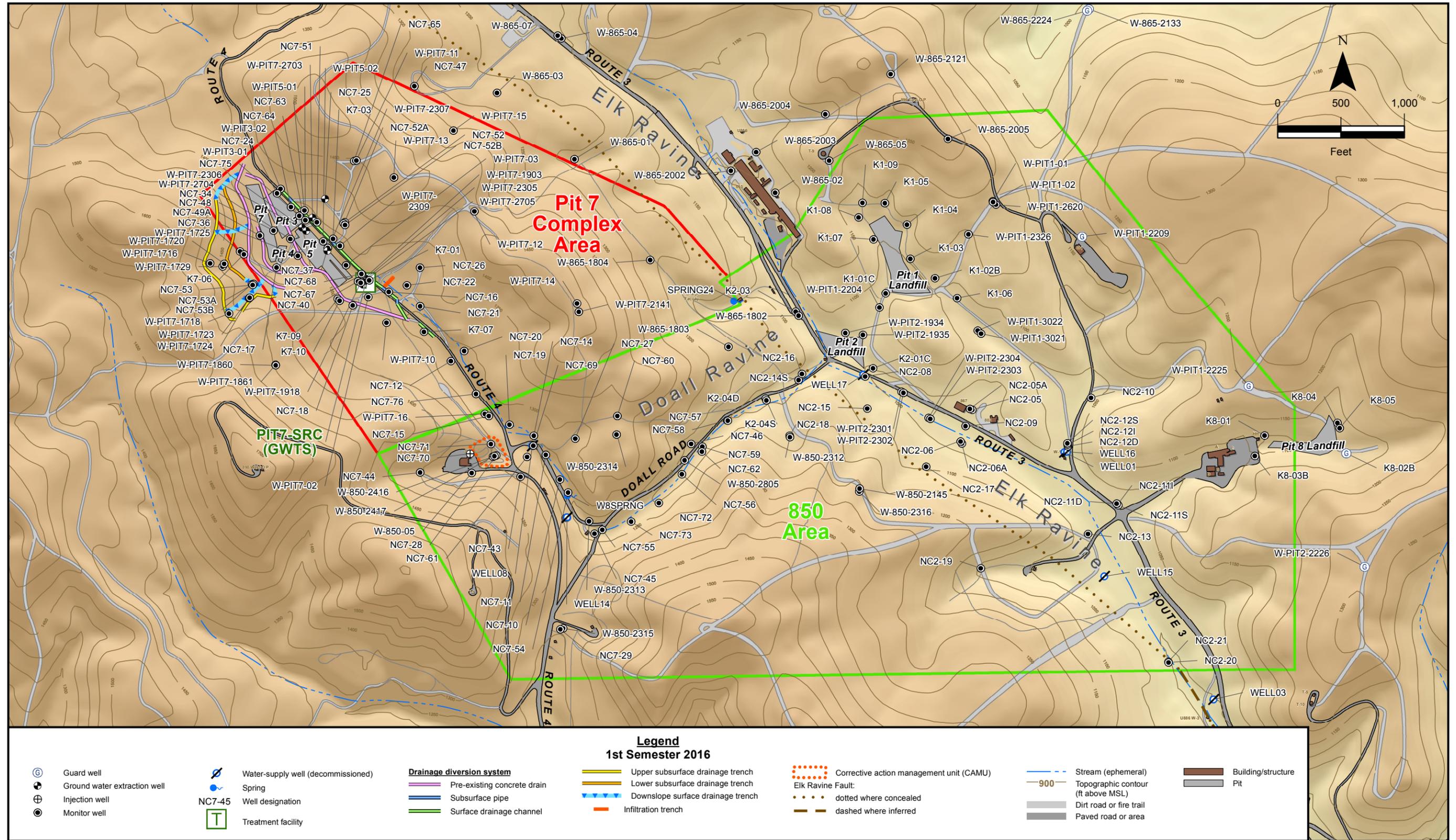


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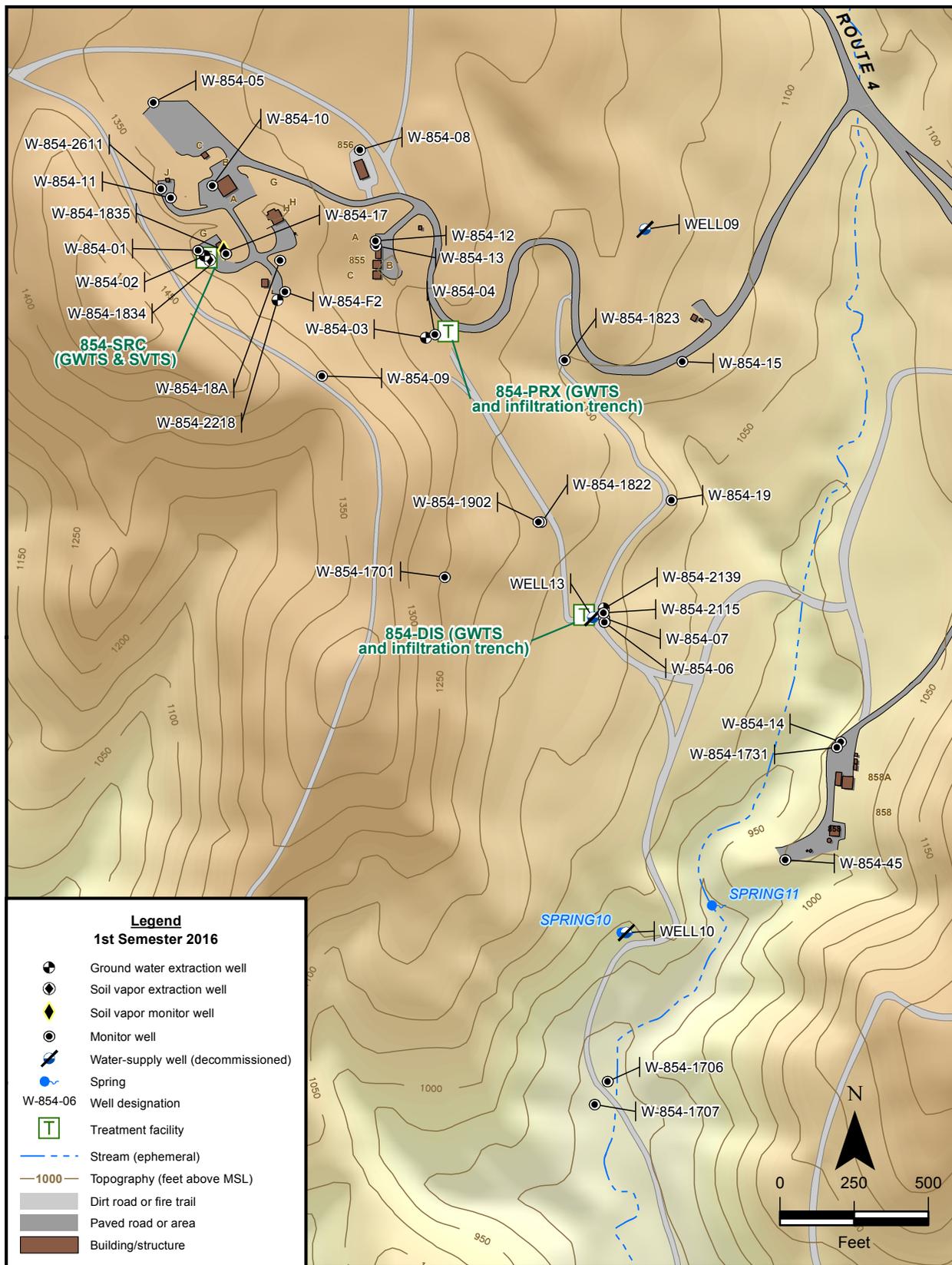


Figure 2.6-1. Building 854 Operable Unit site map showing monitor and extraction wells, and treatment facilities.

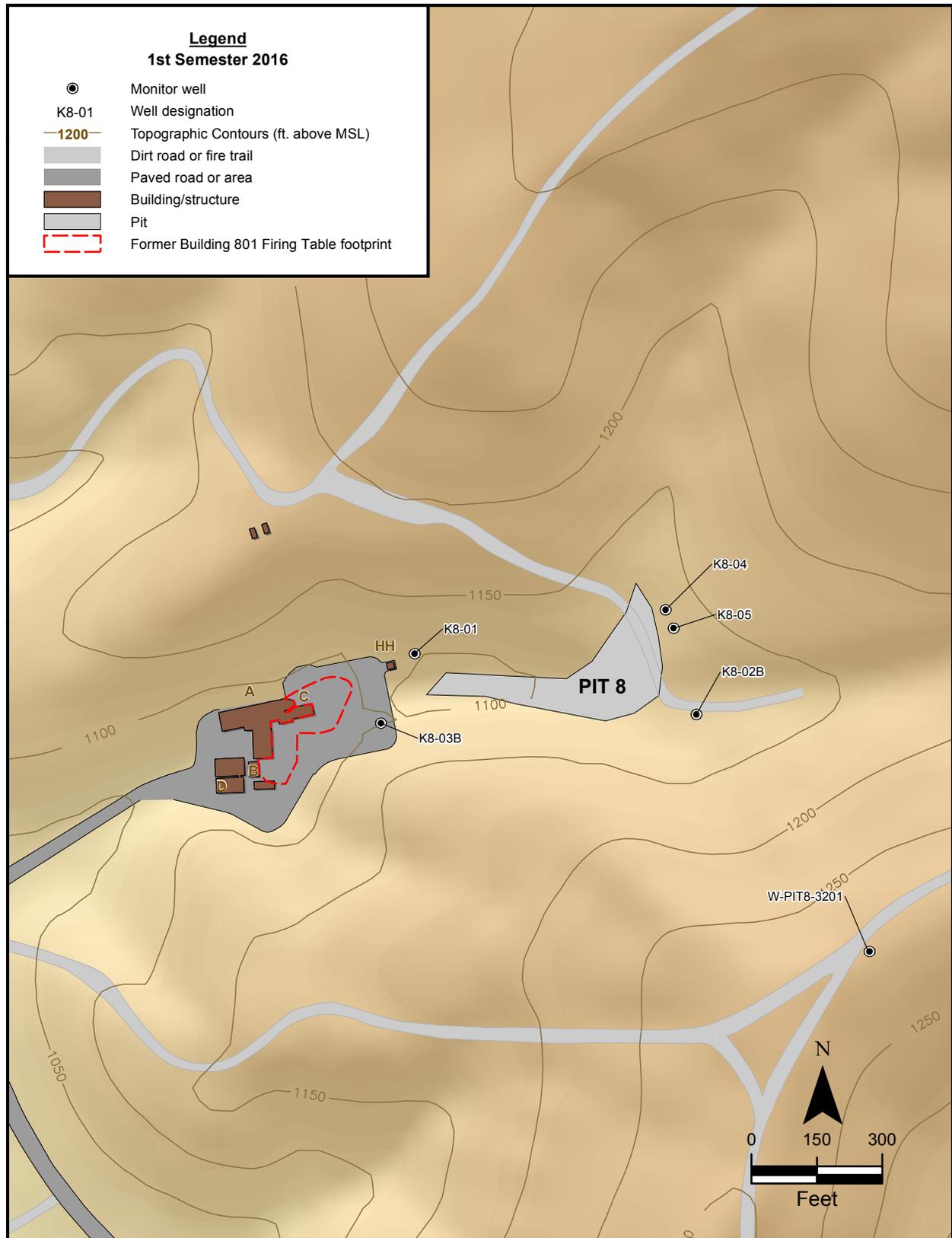


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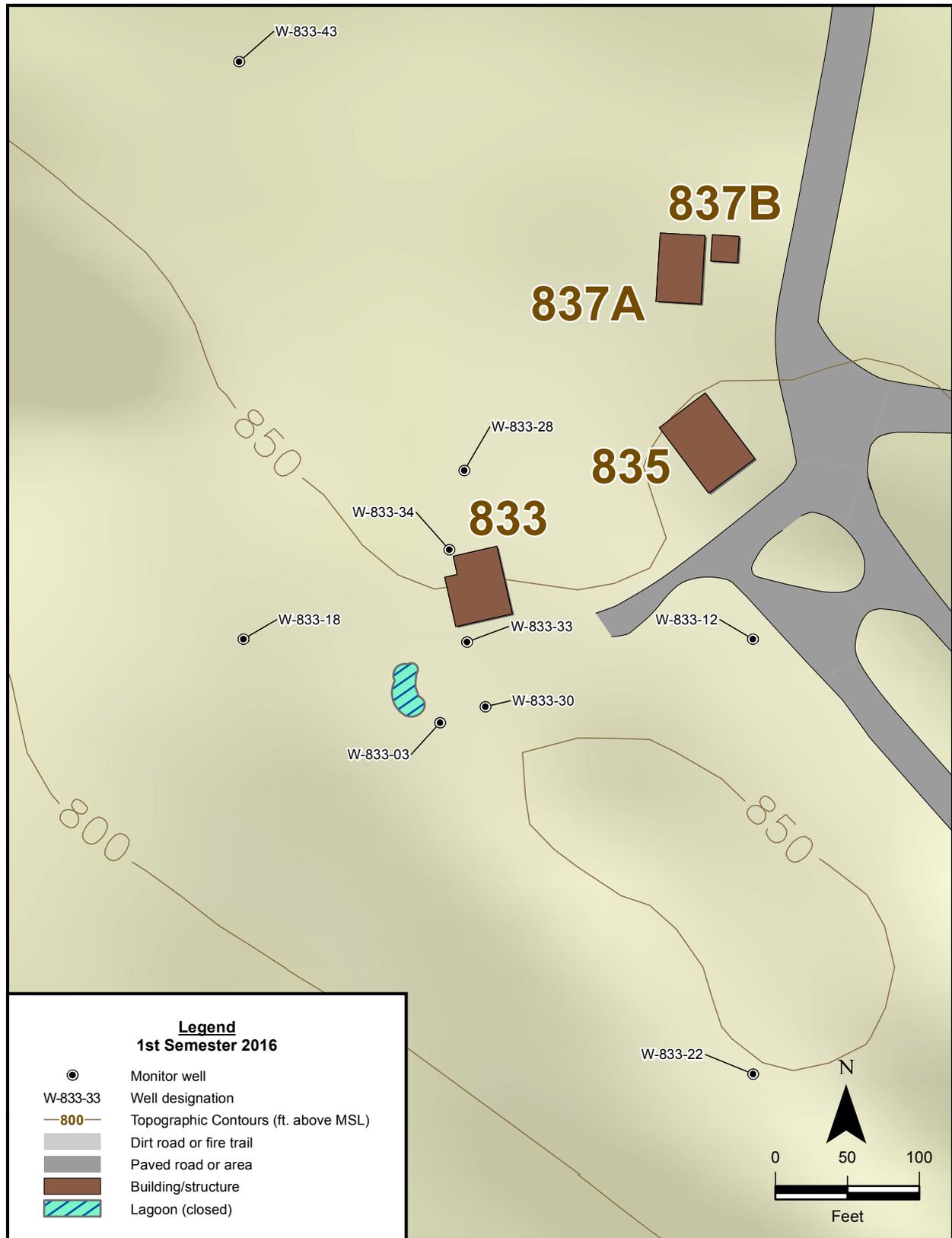


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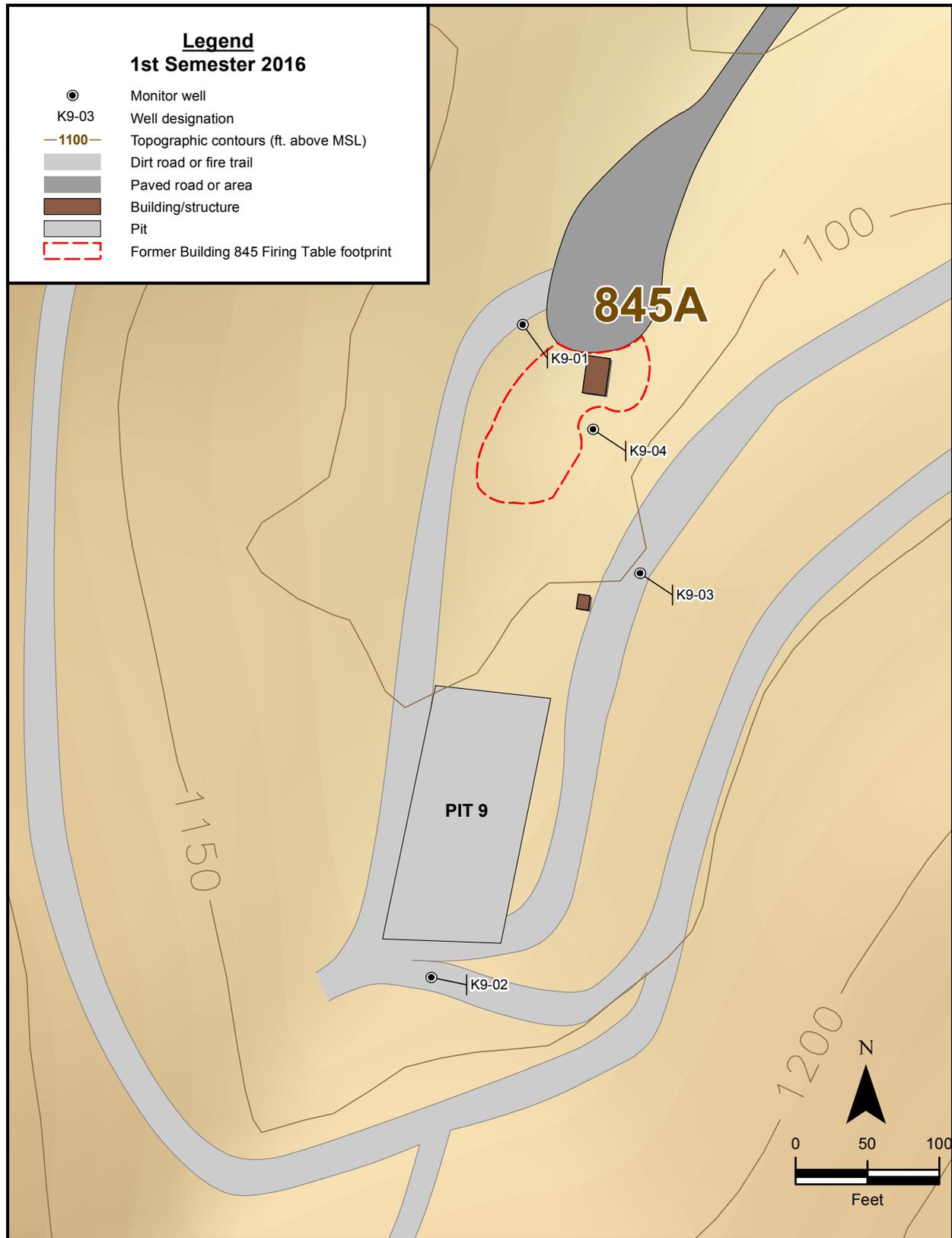


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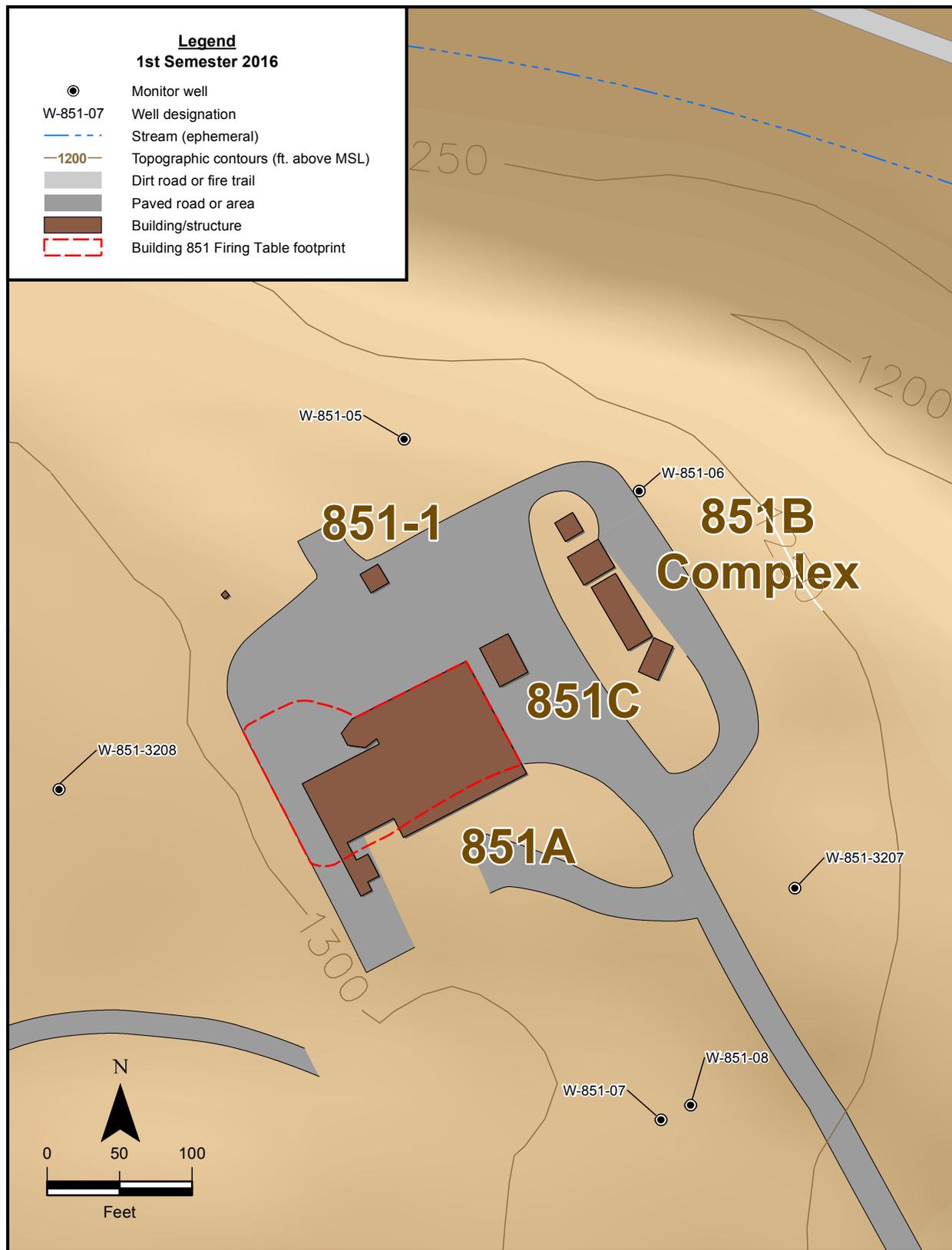


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Acronyms and Abbreviations

1,1-DCA	1,1-Dichloroethane
1,2-DCA	1,2-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene (total)
1,1,1-TCA	1,1,1-Trichloroethane
1,1,2-TCA	1,1,2-Trichloroethane
2-ADNT	4-Amino-2,6-dinitrotoluene
4-ADNT	4-Amino-2,6-dinitrotoluene
815	Building 815
817	Building 817
829	Building 829
832	Building 832
834	Building 834
845	Building 845
850	Building 850
851	Building 851
854	Building 854
A	Annual
As N	As nitrogen
As CaCO ₃	As calcium carbonate
BA	Blanket agreement
BTEX	Benzene, toluene, ethyl benzene, and xylene
°C	Degrees Celsius
C12-C24	Diesel range organic compounds in the carbon 12 to carbon 24 range
CAL	Contracted analytical laboratories
CAMU	Corrective Action Management Unit
CAP	Corrective and Preventative Action Program
CCVs	Continuing calibration verifications
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFE	Carbon filter effluent
CFI	Carbon filter influent
CF2I	Second aqueous phase granular carbon filter influent
CF3I	Third aqueous phase granular carbon filter influent
cf	Cubic feet
cfm	Cubic feet per minute
CFORM	Chloroform
CFV2	Second vapor phase granular activated carbon filter effluent
CGSA	Central General Services Area
CHC	Corral Hollow Creek
c-1,2-DCE	cis-1,2-Dichloroethene
cis-1,2-DCE	cis-1,2-Dichloroethene
CMP/CP	Compliance Monitoring Plan/Contingency Plan
CMR	Compliance Monitoring Report
CO ₂	Carbon dioxide
COC	Contaminants of Concern
CT	Carbon Tetrachloride

CTET	Carbon tetrachloride
DEET	n,n-diethyl-meta-toluamide
DIS	Discretionary sampling (not required by the CMP)
DISS	Distal south
DMW	Detection monitor well
DNAPL	Dense, non-aqueous-phase liquid
DOE	Department of Energy
DOECAP	Department of Energy Consolidated Audit Program
DSB	Distal Site Boundary
DTSC	Department of Toxic Substances Control
DUP	Duplicate or collocated QC sample
E	Effluent (acronym found in Treatment Facility Sampling Plan Tables)
E	Sample to be collected during even numbered years (i.e., 2016) (acronym found in Sampling Plan Tables)
EcoSSLs	Ecological Soil Screening Levels
EFA	Environmental Functional Area
EGSA	Eastern General Services Area
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
EMS	Environmental Management System
EPA	Environmental Protection Agency
ERD	Environmental Restoration Department
ES&H	Environmental Safety and Health
EV	Effluent vapor
EW	Extraction well
Freon 11	Trichlorofluoromethane
Freon 113	1,1,2-trichloro-1,2,2-trifluoroethane
ft	Feet
ft ³	Cubic feet
g	Gram(s)
GAC	Granular activated carbon
gal	Gallon(s)
GIS	Geographic Information Systems
gpd	Gallons per day
gpm	Gallons per minute
GSA	General Services Area
GTU	Ground Water Treatment Unit.
GW	Guard well
GWTS	Ground Water Treatment System
HE	High Explosives
HEPA	High Explosives Process Area
H-H	Hetch-Hetchy
HMX	High-Melting Explosive
HQ	Hazard quotient
HSU	Hydrostratigraphic unit
I	Influent
ICP-MS	Inductively Coupled Plasma - Mass Spectrometry
ISMA	<i>In Situ</i> Microcosm Array
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
ITS	Issues Tracking System

IV	Influent vapor
IW	Injection well
IWS	Integrated Work Sheet
K-40	Potassium-40
kft ³	Thousands of cubic feet
kg	Kilograms
kgal	Thousands of gallons
km	Kilometers
LCS	Laboratory Control Sample
LHC	Light hydrocarbon
LLNL	Lawrence Livermore National Laboratory
LNAPL	Light, non-aqueous-phase liquid
µg/L	Micrograms per liter
µg/m ³	Micrograms per meters cubed
µmhos/cm	Micro ohms per centimeter
µS	Microsiemens
M	Monthly
MCL	Maximum Contaminant Level
MeCL	Methylene chloride
Mgal	Millions of gallons
Mg/kg/d	Milligram per kilogram per day
mg/L	Milligrams per liter
MNA	Monitored Natural Attenuation
MOVI	Management observations, verifications, and inspections
MSA	Management self-assessment
MSA	Mean Sea Level
MTU	Miniature Treatment Unit
mV	Millivolts
MWB	Monitor well used for background
N	No
NB	Nitrobenzene
N ₂	Nitrogen
NO ₃	Nitrate
NA	Not applicable
NT	Nitrotoluene
NTU	Nephelometric turbidity units
O	Sample to be collected during odd numbered years (i.e., 2015)
OR	Occurrence Report
ORP	Oxidation/reduction potential
OU	Operable unit
O&M	Operations and Maintenance
P/PO ₄	Phosphorous
PCBs	Polychlorinated biphenyls
PCE	Tetrachloroethene
pCi/L	PicoCuries per liter
pH	A measure of the acidity or alkalinity of an aqueous solution
PHG	Public Health Goal
PLC	Programmatic logic control
ppb _v	Parts per billion by volume
ppm _v	Parts per million on a volume-to-volume basis

PBA	Programmatic Biological Assessment
PPCP	Pharmaceutical and Personal Care Product analytes
PRX	Proximal
PRXN	Proximal north
PSDMP	Post-Monitoring Shutdown Plan
PTMW	Plume Tracking Monitor Well
PTU	Portable Treatment Unit
PVC	Polyvinyl chloride
Q	Quarterly
QAL	Quaternary alluvium
QAPP	Quality Assurance Project Plan
QA/QC	Quality assurance/quality control
QIF	Quality Improvement Form
RAOs	Remedial Action Objectives
R1	Receiving water sampling point located 100 ft upstream
R2	Receiving water sampling point located 100 ft downstream
RCRA	Resource Conservation and Recovery Act
RDX	Research Department explosive
REA	Reanalysis
Redox	Reduction-oxidation reaction
REVAL	Remediation Evaluation Process
REX	Resample
ROD	Record of Decision
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board
S	Semi-annual
Scfm	Standard cubic feet per minute
SLs	Statistical Limits
SOP	Standard Operating Procedure
SOW	Statement of work
SPACT	Sample Planning and Chain of Custody Tracking
SPR	Spring
SRC	Source
STU	Solar-powered Treatment Unit
SVE	Soil Vapor Extraction
SVTS	Soil Vapor Treatment System
SVI	Soil Vapor Influent
SWEIS	Site-Wide Environmental Impact Statement
SWFS	Site Wide Feasibility Study
SWRI	Site-Wide Remedial Investigation
TBOS	Tetrabutyl orthosilicate
TCE	Trichloroethene
TCEP	tris (2-chloroethyl) phosphate
TDS	Total dissolved solids
TF	Treatment facility
TFRT	Treatment Facility Real Time
THMs	Trihalomethanes
TKEBS	Tetrakis (2-ethylbutyl) silane
TNB	Trinitrobenzene
TNT	Trinitrotoluene

Total-1,2-DCE	1,2-Dichloroethene (total)
Trans-1,2-DCE	Trans-1,2-dichloroethene
TRV	Toxicity Reference Value
TVOC	Total volatile organic compounds
t-1,2-DCE	trans-1,2-Dichloroethene
$^{235}\text{U}/^{238}\text{U}$	Atom ratio of the isotopes uranium-235 and uranium-238
U.S.	United States
VC	Vinyl chloride
VCF4I	Fourth vapor phase granular activated carbon filter influent
VE	Vapor effluent
VES	Vapor extraction system
VI	Vapor influent
VOC	Volatile organic compound
WAA	waste accumulation area
WBR	Weathered bedrock
WGMG	Water Guidance and Monitoring Group
WS	Water supply well
Y	Yes

Hydrogeologic Units

- Lower Tnbs₁ = Lower member of the Neroly lower blue sandstone, below claystone marker bed (regional aquifer).
- Qal = Quaternary alluvium.
- Qls = Quaternary landslide.
- Qt = Quaternary terrace.
- Tmss = Miocene Cierbo Formation—lower siltstone/claystone member.
- Tnsc_{1a}, Tnsc_{1b}, Tnsc_{1c} = Sandstone bodies within the Tnsc₁ Neroly middle siltstone/claystone (1a = deepest).
- Tnbs₁ = Lower member of the Neroly lower blue sandstone.
- Tnbs₀ = Neroly silty sandstone.
- Tnbs₂ = Miocene Neroly upper blue sandstone.
- Tnsc₀ = Tertiary Neroly Formation—lower siltstone/claystone member.
- Tnsc₂ = Miocene Neroly Formation—upper siltstone/claystone member.
- Tps = Pliocene non-marine unit.
- Tpsg = Miocene non-marine unit (gravel facies).
- Tts = Tesla Formation.
- UTnbs₁ = Upper member of the Neroly lower blue sandstone, above claystone marker bed.
- WBR = Weathered bedrock.

Data Qualifier Flag Definitions

- B = Analyte found in method blank, sample results should be evaluated.
- D = Analysis performed at a secondary dilution or concentration (i.e., vapor samples).
- E = The analyte was detected below the LLNL reporting limit, but above the analytical laboratory minimum detection limit.
- F = Analyte found in field blank, trip blank, or equipment blank.
- G = Quantitated using fuel calibration, but does not match typical fuel fingerprint.
- H = Sample analyzed outside of holding time, sample results should be evaluated.
- I = Surrogate recoveries were outside of QC limits.
- J = Analyte was positively identified; the associated numerical value is the proximate concentration of the analyte in the sample.
- L = Spike accuracy not within control limits.
- O = Duplicate spike or sample precision not within control limits.
- R = Sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- S = Analytical results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
- T = Analyte is tentatively identified compound; result is approximate.

Requested Analyses

- AS:UIISO = Uranium isotopes performed by alpha spectrometry.
- DWMETALS:ALL = Drinking water metals suite performed by various analytical methods.
- E200.7:FE = Iron performed by EPA Method 200.7.
- E200.7:Li = Lithium performed by EPA Method 200.7.
- E200.7:SI = Silica performed by EPA Method 200.7.
- E200.8:AS = Arsenic performed by EPA Method 200.8.
- E200.8:CR = Chromium performed by EPA Method 200.8.
- E200.8:MN = Manganese performed by EPA Method 200.8.
- E200.8:SE = Selenium performed by EPA Method 200.8.
- E300.0:NO3 = Nitrate performed by EPA Method 300.0.
- E300.0:PERC = Perchlorate performed by EPA Method 300.0.
- E300.0:O-PO2 = Orthophosphate performed by EPA Method 300.0.
- E340.2:ALL = Fluoride performed by EPA method 340.2.
- E502.2:ALL = Volatile organic compounds performed by EPA Method 502.2.
- E601:ALL = Halogenated volatile organic compounds performed by EPA Method 601.
- E624:ALL = Volatile organic compounds performed by EPA Method 624.
- E8082A = Polychlorinated biphenyls performed by EPA Method 8082A.
- E8260:ALL = Volatile organic compounds performed by EPA Method 8260.
- E8330LOW:ALL = High explosive compounds performed by EPA Method 8330.
- E8330:R+H = High explosive compounds RDX and HMX performed by EPA Method 8330.
- E8330:TNT = Trinitrotoluene performed by EPA Method 8330.
- E906:ALL = Tritium performed by EPA Method 906.
- EM8015:DIESEL = Diesel range organic compounds performed by modified EPA Method 8015.
- GENMIN:ALL = General minerals suite performed by various analytical methods.
- MS:UIISO = Uranium isotopes performed by mass spectrometry.
- T26METALS:ALL = Title 26 metals.
- TBOS:ALL = Tetrabutylorthosilicate/ Tetrakis (2-ethylbutyl) silane.

Ground Water Elevation Table Notes

- ABD = Abandoned.
- AD = Drilling of adjacent new wells disturbed water level.
- BLOC = Well Blocked.
- BS = Water detected below bottom of screened interval.
- CB = Installation completed as a Christy box.
- DRY = No water detected in well casing at time of measurement.
- FA = Flowing artesian well, water elevation converted.
- FL = Flowing.
- ME = Measuring error suspected.
- MSL = Mean Sea Level.
- MT = Measured twice.
- NA = Information not available.
- NM = Not Measured.
- NOM = Not on field map.
- PD = Predevelopment measurement.
- PE = Pump Extraction.
- PF = Pump not running at time of measurement.
- PS = Measurement taken just before sampling.
- PT = Pump test interfered with measurement.
- RA = Restricted access.
- UC = Unsafe conditions.
- VE = Vacuum Extraction.
- WE = Well equilibrium suspect.
- WR = Well recovery.

Table Summ-1. Mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Volume of ground water treated (thousands of gal)	Volume of soil vapor treated (thousands of cf)	Estimated total VOC mass removed (g)	Estimated total perchlorate mass removed (g)	Estimated total nitrate mass removed (kg)	Estimated total RDX mass removed (g)	Estimated total TBOS/ TKEBS mass removed (g)	Estimated total Uranium mass removed (g)
CGSA GWTS	862	NA	110	NA	NA	NA	NA	NA
CGSA SVTS	NA	7,835	19	NA	NA	NA	NA	NA
834 GWTS	65	NA	240	NA	36	NA	0.055	NA
834 SVTS	NA	25,232	1,500	NA	NA	NA	NA	NA
815-SRC GWTS	268	NA	4.4	3.8	100	28	NA	NA
815-PRX GWTS	123	NA	9.0	4.1	38	0.95	NA	NA
815-DSB GWTS	801	NA	21	NA	NA	NA	NA	NA
817-SRC GWTS	<1	NA	0	0.035	0.13	0.063	NA	NA
817-PRX GWTS	216	NA	5.6	13	79	12	NA	NA
829-SRC GWTS	<1	NA	0.054	0.025	0.17	NA	NA	NA
PIT7-SRC GWTS	17	NA	0.0012	0.66	2.8	NA	NA	1.8
854-SRC GWTS	<1	NA	0	0	0	NA	NA	NA
854-SRC SVTS	NA	<1	0	NA	NA	NA	NA	NA
854-PRX GWTS	382	NA	20	1.8	56	NA	NA	NA
854-DIS GWTS	<1	NA	0.0067	0.0012	0.0049	NA	NA	NA
832-SRC GWTS	32	NA	12	0.54	13	NA	NA	NA
832-SRC SVTS	NA	759	6.8	NA	NA	NA	NA	NA
830-SRC GWTS	1,392	NA	490	0.90	62	NA	NA	NA
830-SRC SVTS	NA	1,798	180	NA	NA	NA	NA	NA
830-DISS GWTS	254	NA	6.1	1.3	55	NA	NA	NA
Total	4,412	35,624	2,600	26	440	41	0.055	1.8

Notes:

815 = Building 815.
 817 = Building 817.
 829 = Building 829.
 830 = Building 830.
 832 = Building 832.
 834 = Building 834.
 854 = Building 854.
 cf = Cubic feet.
 CGSA = Central General Services Area.
 DIS = Distal.
 DISS = Distal south.
 DSB = Distal site boundary.
 g = Grams.
 gal = Gallons.
 GWTS = Ground water treatment system.

kg = Kilograms.
 NA = Not applicable.
 PRX = Proximal.
 RDX = Research Department Explosive.
 SRC = Source.
 SVTS = Soil vapor treatment system.
 TBOS = Tetra 2-ethylbutylorthosilicate.
 TKEBS = Tetrakis (2-ethylbutyl) silane.
 VOC = Volatile organic compound.
 Nitrate re-injected into the Tnbs, HSU undergoes *in situ* biotransformation to benign N₂ gas by anaerobic denitrifying bacteria. Nitrate mass removal is calculated assuming complete removal of nitrate from treated ground water. At Pit7, re-injected effluent may contain nitrate concentrations below the discharge limit but above the detection limit. Thus, nitrate mass removal calculations at Pit7 are overestimated.

Table Summ-2. Summary of cumulative remediation.

Treatment facility	Volume of ground water treated (thousands of gallons)	Volume of soil vapor treated (thousands of Cubic feet)	Estimated total VOC mass removed (kg)	Estimated total perchlorate mass removed (g)	Estimated total nitrate mass removed (kg)	Estimated total RDX mass removed (kg)	Estimated total TBOS/TKEBS mass removed (kg)	Estimated total Uranium mass removed (kg)
EGSA GWTS	309,379	NA	7.6	NA	NA	NA	NA	NA
CGSA GWTS	28,187	NA	26	NA	NA	NA	NA	NA
CGSA SVTS	NA	227,167	78	NA	NA	NA	NA	NA
834 GWTS	1,319	NA	46	NA	390	NA	9.5	NA
834 SVTS	NA	540,405	360	NA	NA	NA	NA	NA
815-SRC GWTS*	8,973	NA	0.22	290	3,200	2.0	NA	NA
815-PRX GWTS*	9,657	NA	0.98	230	2,900	0.0041	NA	NA
815-DSB GWTS	22,743	NA	0.74	NA	NA	NA	NA	NA
817-SRC GWTS*	68	NA	0	7.0	22	0.011	NA	NA
817-PRX GWTS*	6,200	NA	0.23	520	2,200	0.18	NA	NA
829-SRC GWTS	10	NA	0.00063	0.36	2.6	NA	NA	NA
PIT7-SRC GWTS	209	NA	0.0025	9.3	30	NA	NA	0.026
854-SRC GWTS	13,072	NA	6.0	170	2,400	NA	NA	NA
854-SRC SVTS	NA	155,858	14	NA	NA	NA	NA	NA
854-PRX GWTS	7,335	NA	0.79	180	1,100	NA	NA	NA
854-DIS GWTS	76	NA	0.0094	1.2	5.9	NA	NA	NA
832-SRC GWTS	1,018	NA	0.30	26	400	NA	NA	NA
832-SRC SVTS	NA	29,067	2.2	NA	NA	NA	NA	NA
830-SRC GWTS	16,585	NA	9.2	27	1,100	NA	NA	NA
830-SRC SVTS	NA	85,651	54	NA	NA	NA	NA	NA
830-PRXN GWTS	1,949	NA	0.26	NA	22	NA	NA	NA
830-DISS GWTS	10,774	NA	1.7	83	2,600	NA	NA	NA
Total	437,554	1,038,149	610	1,500	16,000	2.2	9.5	0.026

Notes:

815 = Building 815.
 817 = Building 817.
 829 = Building 829.
 830 = Building 830.
 832 = Building 832.
 834 = Building 834.
 854 = Building 854.
 CGSA = Central General Services Area.
 DIS = Distal.
 DISS = Distal south.
 DSB = Distal site boundary.
 EGSA = Eastern General Services Area.
 GWTS = Ground water treatment system.
 kg = Kilograms.

NA = Not applicable.
 PRX = Proximal.
 PRXN = Proximal North.
 RDX = Research Department Explosive.
 SRC = Source.
 SVTS = Soil vapor treatment system.
 TBOS = Tetra 2-ethylbutylorthosilicate.
 TKEBS = Tetrakis (2-ethylbutyl) silane.
 VOC = Volatile organic compound.
 Nitrate re-injected into the Tnbs HSU undergoes *in situ* biotransformation to benign N₂ gas by anaerobic denitrifying bacteria. Nitrate mass removal is calculated assuming complete removal of nitrate from treated ground water. At Pit7, re-injected effluent may contain nitrate concentrations below the discharge limit but above the detection limit. Thus, nitrate mass removal calculations at Pit7 are overestimated.

Table 2-1. Wells and boreholes installed during first semester 2016.

Well name	Planned well type	OU	Well/Borehole installation date	HSU	Drill Depth (ft-bgs)	Casing depth (ft-bgs)	Screened interval (ft-bgs)	Primary COCs	Primary COC sampling frequency	Secondary COCs	Secondary COC sampling frequency
W-832-3209	MW	OU7	3/10/16	Tnsc _{1a}	60	40.75	30-40	VOCs	Semi-annually	Perchlorate, Nitrate	Annually
W-832-3210	MW	OU7	3/17/16	Tnsc _{1a}	50	40.75	30-40	VOCs	Semi-annually	Perchlorate, Nitrate	Annually
W-851-3207	MW	OU8	4/18/16	Tmss	204	202.75	186-196	None	None	None	None
W-851-3208	MW	OU8	5/13/16	Tmss	204	202.75	182-202	None	None	None	None
W-PIT8-3201	MW	OU8	5/25/16	Tnbs ₁ /Tnbs ₀	338	335.75	325-335	VOCs	Semi-annually	Perchlorate, Nitrate	Annually

Notes:

bgs = Below ground surface.
 COC = Contaminant of concern.
 ft = Feet.
 HSU = Hydrostratigraphic unit.
 OU = Operable Unit.
 MW = Monitor Well.

Table 2.1-1. Central General Services Area (CGSA) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
CGSA	January	720	0	1,410	0
	February	58949	0	1,473	0
	March	720	0	1,313	0
	April	696	624	1,171	322,314
	May	792	336	1,245	186,556
	June	720	672	1,223	352,700
Total		62,597	1,632	7,835	861,570

Table 2.1-2. General Services Area Operable Unit volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2- DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
CGSA-I	4/5/16	40	2.8	4.6	<0.5	<0.5	<0.5	<0.5	<0.5	0.68	<0.5	<0.5	0.65	<0.5	<0.5
CGSA-E	4/5/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CGSA-E	5/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CGSA-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

No samples collected in January, February, or March due to shut down for misting tower motor evaluation and repairs.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.1-2 (Con't). Analyte detected but not reported in main table.

Location	Date	Detection frequency	1,2-DCE (total) (µg/L)
CGSA-I	4/5/16	1 of 18	4.9
CGSA-E	4/5/16	0 of 18	-
CGSA-E	5/3/16	0 of 18	-
CGSA-E	6/6/16	0 of 18	-

Notes:

No samples collected in January, February, or March due to shut down for misting tower motor evaluation and repairs.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.1-3. Central General Services Area Operable Unit treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
<i>CGSA GWTS</i>			
Influent Port	CGSA-I	VOCs	Quarterly
		pH	Quarterly
Effluent Port	CGSA-E	VOCs	Monthly
		pH	Monthly
<i>CGSA SVTS</i>			
Influent Port	CGSA-VI	No Monitoring Requirements	
Effluent Port	CGSA-VE	VOCs	Weekly^a
Intermediate GAC	CGSA-VCF2I	VOCs	Weekly^a

Notes:

^a Weekly monitoring for VOCs will consist of the use of a flame-ionization detector, photo-ionization detector, or other District-approved VOC detection device.

One duplicate and one blank (given fictitious labels) shall be taken for every 12 samples.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.1-4. General Services Area Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
CDF1	WS	LTnbs1	A	WGMG	E524.2MOD:ALL	1	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CDF1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON1	WS	LTnbs1	A	WGMG	E524.2MOD:ALL	1	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON1	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON2	WS	LTnbs1	A	WGMG	E624MOD:ALL	1	Y	
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	1	Y	
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	2	Y	
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	3		
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
CON2	WS	LTnbs1	M	CMP	E624MOD:ALL	4		
W-26R-06	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	2	N	Inoperable equipment.
W-26R-06	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	4		
W-26R-11	PTMW	Qal-Tnbs1	S	DIS	E624MOD:ALL	2	Y	
W-35A-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-02	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-02	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-03	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-03	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-04	PTMW	Qt-Tnsc1	A	WGMG	E524.2MOD:ALL	4		
W-35A-04	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-04	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-05	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-35A-05	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-35A-06	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-06	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-07	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-35A-07	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-35A-08	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	1	Y	
W-35A-08	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	2	Y	
W-35A-08	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	3		
W-35A-08	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	4		
W-35A-09	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-09	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-10	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-35A-10	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-35A-11	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-35A-11	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-35A-12	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	

Table 2.1-4. General Services Area Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-35A-12	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-35A-13	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	N	Inoperable equipment.
W-35A-13	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-35A-14	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	1	Y	
W-35A-14	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	2	Y	
W-35A-14	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	3		
W-35A-14	GW	Qt-Tnsc1	Q	CMP	E624MOD:ALL	4		
W-7A	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7A	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-7B	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7B	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-7C	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7C	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-7DS	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7DS	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	4		
W-7E	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7E	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-7ES	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-7ES	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-7F	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-7F	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-7G	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7G	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-7H	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-7H	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-7I	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-7I	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-7I	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-7I	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-7J	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-7J	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-7K	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7K	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-7L	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7L	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-7M	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7M	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-7N	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-7N	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-7O	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-7O	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-7O	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-7O	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-7P	EW	Qal-Tnbs1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-7P	EW	Qal-Tnbs1	S	CMP-TF	E624MOD:ALL	2	Y	
W-7P	EW	Qal-Tnbs1	S	DIS-TF	E624MOD:ALL	3		
W-7P	EW	Qal-Tnbs1	S	CMP-TF	E624MOD:ALL	4		
W-7PS	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	2	N	Insufficient water.
W-7PS	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	4		
W-7Q	PTMW	Qt-Tnsc1	S	DIS	E624MOD:ALL	2	Y	
W-7R	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-7R	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-7R	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-7R	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-7S	PTMW	Qt-Tnsc1	S	DIS	E624MOD:ALL	2	Y	
W-7T	PTMW	Qt-Tnsc1	S	DIS	E624MOD:ALL	2	Y	
W-843-01	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	N	No access to well location.
W-843-01	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-843-02	PTMW	UTnbs1	S	CMP	E624MOD:ALL	2	Y	
W-843-02	PTMW	UTnbs1	S	CMP	E624MOD:ALL	4		
W-872-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	N	DRY.
W-872-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-872-02	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-872-02	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-872-02	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-872-02	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-873-01	PTMW	LTnbs1	S	CMP	E624MOD:ALL	2	Y	

Table 2.1-4. General Services Area Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-873-01	PTMW	LTnbs1	S	CMP	E624MOD:ALL	4		
W-873-02	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-873-02	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-873-03	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-873-03	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-873-04	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-873-04	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-873-06	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-873-06	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-873-07	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-873-07	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-873-07	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-873-07	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-875-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-875-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-875-02	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-875-02	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-875-03	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-875-03	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-875-04	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-875-04	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-875-05	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-875-05	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-875-06	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-875-06	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-875-07	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-875-07	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-875-07	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-875-07	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-875-08	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-875-08	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	Y	
W-875-08	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-875-08	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-875-09	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-875-09	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	N	Well location under construction.
W-875-09	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-875-09	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-875-10	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-875-10	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	N	Well location under construction.
W-875-10	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-875-10	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-875-11	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-875-11	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	N	Well location under construction.
W-875-11	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-875-11	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-875-15	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-875-15	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	2	N	Well location under construction.
W-875-15	EW	Qt-Tnsc1	S	DIS-TF	E624MOD:ALL	3		
W-875-15	EW	Qt-Tnsc1	S	CMP-TF	E624MOD:ALL	4		
W-876-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-876-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-879-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-879-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-889-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-889-01	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-CGSA-1732	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	N	DRY.
W-CGSA-1732	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-CGSA-1733	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-CGSA-1733	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		
W-CGSA-1735	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	2	N	DRY.
W-CGSA-1735	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	4		
W-CGSA-1736	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-CGSA-1736	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	4		
W-CGSA-1737	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-CGSA-1737	PTMW	Qal-Tnbs1	S	CMP	E624MOD:ALL	4		
W-CGSA-1739	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	2	Y	
W-CGSA-1739	PTMW	Qt-Tnsc1	S	CMP	E624MOD:ALL	4		

Table 2.1-4. General Services Area Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	AS:UISO	2	N	Well location under construction.
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	AS:UISO	3		
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E300.0:NO3	1	N	Well location under construction.
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E300.0:NO3	2	N	Well location under construction.
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E300.0:NO3	3		
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E624MOD:ALL	2	N	Well location under construction.
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E624MOD:ALL	3		
W-CGSA-2708	PTMW	Qt-Tnsc1	Q	DIS-TF	E624MOD:ALL	4		

Table 2.1-5. Central General Services Area (CGSA) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
CGSA	January	0.11	0	NA	NA	NA	NA
	February	0.57	0	NA	NA	NA	NA
	March	0.45	0	NA	NA	NA	NA
	April	0.51	42	NA	NA	NA	NA
	May	8.6	25	NA	NA	NA	NA
	June	8.7	44	NA	NA	NA	NA
Total		19	110	NA	NA	NA	NA

Table 2.2-1. Building 834 (834) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
834	January	0	0	0	0
	February	528	528	3,995	9,691
	March	696	696	5,318	12,456
	April	648	648	4,787	11,864
	May	864	864	6,012	17,646
	June	720	720	5,119	13,151
Total		3,456	3,456	25,231	64,808

Table 2.2-2. Building 834 Operable Unit volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2-DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
834-I	2/16/16	850 D	9.4 D	220 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D
834-I	4/4/16	830 D	6.8 D	170 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D
834-E	2/16/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
834-E	3/1/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
834-E	4/4/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
834-E	5/2/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
834-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

No samples collected in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.2-2 (Con't). Analyte detected but not reported in main table.

Location	Date	Detection frequency	1,2-DCE (total) (µg/L)
834-I	2/16/16	1 of 18	220 D
834-I	4/4/16	1 of 18	170 D
834-E	2/16/16	0 of 18	-
834-E	3/1/16	0 of 18	-
834-E	4/4/16	0 of 18	-
834-E	5/2/16	0 of 18	-
834-E	6/6/16	0 of 18	-

Notes:

No samples collected in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.2-3. Building 834 Operable Unit diesel range organic compounds in ground water extraction and treatment system influent and effluent.

Location	Date	Diesel Range Organics (C12-C24) (µg/L)
834-I	2/16/16	<200
834-I	4/4/16	<200
834-E	2/16/16	<200
834-E	3/1/16	<200
834-E	4/4/16	<200
834-E	5/2/16	<200
834-E	6/6/16	<200

Notes:

No samples collected in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.2-4. Building 834 Operable Unit tetrabutyl orthosilicate/tetrakis (2-ethylbutyl) silane (TBOS/TKEBS) in ground water extraction and treatment system influent and effluent.

Location	Date	TBOS ($\mu\text{g/L}$)
834-I	2/16/16	<10
834-I	4/4/16	<10
834-E	2/16/16	<10
834-E	3/1/16	<10
834-E	4/4/16	<10
834-E	5/2/16	<10
834-E	6/6/16	<10

Notes:

No samples collected in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.2-5. Building 834 Operable Unit treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
<i>834 GWTS</i>			
Influent Port	834-I	VOCs	Quarterly
		TBOS/TKEBS	Quarterly
		Diesel	Quarterly
		pH	Quarterly
Effluent Port	834-E	VOCs	Monthly
		TBOS/TKEBS	Monthly
		Diesel	Monthly
		pH	Monthly
<i>834 SVTS</i>			
Influent Port	834-VI	No Monitoring Requirements	
Effluent Port	834-VE	VOCs	Weekly ^a
Intermediate GAC	834-VCF4I	VOCs	Weekly ^a

Notes:

^a Weekly monitoring for VOCs will consist of the use of a flame-ionization detector, photo-ionization detector, or other District-approved VOC detection device.

One duplicate and one blank (given fictitious labels) shall be taken for every 12 samples.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.2-6. Building 834 Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-834-1709	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-1709	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-1709	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-1709	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-1711	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	N	Insufficient water. Partial sampling.
W-834-1711	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	N	Insufficient water. Partial sampling.
W-834-1711	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-1711	PTMW	Tps-Tnsc2	A	CMP	TBOS:ALL	1	N	Insufficient water. Partial sampling.
W-834-1824	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water. Partial sampling.
W-834-1824	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water. Partial sampling.
W-834-1824	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-1824	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-1824	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	Insufficient water. Partial sampling.
W-834-1825	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-1825	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-1833	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-1833	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-1833	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	Insufficient water.
W-834-2001	EW	Tps-Tnsc2	A	CMP-TF	E300.0:NO3	1	Y	
W-834-2001	EW	Tps-Tnsc2	S	DIS-TF	E624:ALL	2	Y	
W-834-2001	EW	Tps-Tnsc2	S	DIS-TF	E624:ALL	4		
W-834-2001	EW	Tps-Tnsc2	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-2001	EW	Tps-Tnsc2	S	CMP-TF	E624MOD:ALL	3		
W-834-2001	EW	Tps-Tnsc2	S	DIS-TF	EM8015:DIESEL	1	Y	
W-834-2001	EW	Tps-Tnsc2	S	DIS-TF	EM8015:DIESEL	3		
W-834-2001	EW	Tps-Tnsc2	A	CMP-TF	TBOS:ALL	1	Y	
W-834-2001	EW	Tps-Tnsc2	A	DIS-TF	TBOS:ALL	3		
W-834-2113	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2113	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-2113	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-2113	PTMW	Tpsg	E	CMP	TBOS:ALL	1	Y	
W-834-2117	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2117	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-2117	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-2117	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-2117	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-2118	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2118	PTMW	Tpsg	S	DIS	E300.0:PERC	1	Y	
W-834-2118	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-2118	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-2118	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-2118	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-2119	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-834-2119	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-834-2119	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-2119	PTMW	Tps-Tnsc2	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-2119	PTMW	Tps-Tnsc2	E	CMP	TBOS:ALL	1	Y	
W-834-A1	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-834-A1	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-834-A1	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-A1	PTMW	Tps-Tnsc2	E	DIS	EM8015:DRANGE	1	Y	
W-834-A1	PTMW	Tps-Tnsc2	A	CMP	TBOS:ALL	1	Y	
W-834-A2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water. Partial sampling.
W-834-A2	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water. Partial sampling.
W-834-A2	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-A2	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	Insufficient water. Partial sampling.
W-834-B2	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-B2	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-B2	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-B2	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-B2	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-B2	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-B2	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		

Table 2.2-6. Building 834 Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-834-B3	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-B3	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-B3	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-B3	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-B3	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-B3	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-B3	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-B4	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-B4	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-B4	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-B4	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-C2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-C2	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-C2	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-C2	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-C4	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-C4	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-C4	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-C4	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-C5	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-C5	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-C5	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-C5	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-D2	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	N	DRY.
W-834-D2	PTMW	LTnbs1	A	CMP	E624MOD:ALL	1	N	DRY.
W-834-D2	PTMW	LTnbs1	A	CMP	TBOS:ALL	1	N	DRY.
W-834-D3	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-D3	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-D3	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D3	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-D4	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-D4	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-D4	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-D4	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-D4	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-D4	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-D4	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-D5	PTMW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-D5	PTMW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-D5	PTMW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-D5	PTMW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-D6	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-D6	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-D6	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-D6	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-D6	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-D6	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-D6	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-D7	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-D7	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-D7	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-D7	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-D7	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-D7	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-D7	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-D9A	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	DRY.
W-834-D9A	PTMW	Tnbs2	A	CMP	E624MOD:ALL	1	N	DRY.
W-834-D9A	PTMW	Tnbs2	A	CMP	TBOS:ALL	1	N	DRY.
W-834-D10	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	N	DRY.
W-834-D10	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-D10	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-D10	PTMW	Tps-Tnsc2	A	CMP	TBOS:ALL	1	N	DRY.
W-834-D11	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-D11	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-834-D11	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D11	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	Insufficient water.
W-834-D12	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	

Table 2.2-6. Building 834 Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-834-D12	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-D12	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-D12	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-D12	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-D12	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-D12	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-D13	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-D13	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-D13	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-D13	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-D13	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-D13	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-D13	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-D14	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-D14	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-D14	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D14	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-D15	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-D15	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-D15	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D15	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-D16	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-D16	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-D16	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D16	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	DRY.
W-834-D17	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-D17	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-D17	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D17	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	DRY.
W-834-D18	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-D18	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-834-D18	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-D18	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	Insufficient water.
W-834-G3	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-G3	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-834-G3	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	DRY.
W-834-H2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-H2	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-H2	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-H2	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	DRY.
W-834-J1	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-J1	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-J1	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-J1	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-J1	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-J1	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-J1	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-J2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-J2	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-J2	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-J2	PTMW	Tpsg	A	CMP	TBOS:ALL	1	Y	
W-834-J3	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-J3	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-J3	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-J3	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-K1A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-K1A	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-K1A	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-K1A	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	DRY.
W-834-M1	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-M1	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-M1	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-M1	PTMW	Tpsg	E	CMP	TBOS:ALL	1	Y	
W-834-M2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-M2	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-M2	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-M2	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	DRY.

Table 2.2-6. Building 834 Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-834-S1	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-S1	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-S1	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-S1	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-S1	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-S1	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-S1	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-S10	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-S10	PTMW	Tpsg	S	CMP	E624:ALL	1	N	DRY.
W-834-S10	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-S10	PTMW	Tpsg	A	CMP	TBOS:ALL	1	N	DRY.
W-834-S12A	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-S12A	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-S12A	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-S12A	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-S12A	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-S12A	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-S12A	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-S13	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	
W-834-S13	EW	Tpsg	S	CMP-TF	E624MOD:ALL	1	Y	
W-834-S13	EW	Tpsg	S	DIS-TF	E624MOD:ALL	2	Y	
W-834-S13	EW	Tpsg	S	CMP-TF	E624MOD:ALL	3		
W-834-S13	EW	Tpsg	S	DIS-TF	E624MOD:ALL	4		
W-834-S13	EW	Tpsg	A	CMP-TF	TBOS:ALL	1	Y	
W-834-S13	EW	Tpsg	A	DIS-TF	TBOS:ALL	3		
W-834-S4	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-S4	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-S4	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-S4	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-S5	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-S5	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-S5	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-S5	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-S6	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-S6	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-834-S6	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-S6	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	Insufficient water.
W-834-S7	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-S7	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-S7	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-S7	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	DRY.
W-834-S8	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-834-S8	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-834-S8	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-S8	PTMW	Tps-Tnsc2	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-S9	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-834-S9	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-834-S9	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-S9	PTMW	Tps-Tnsc2	E	DIS	EM8015:DRANGE	1	Y	
W-834-S9	PTMW	Tps-Tnsc2	E	CMP	TBOS:ALL	1	Y	
W-834-T1	GW	LTnbs1	S	CMP	E300.0:NO3	1	Y	
W-834-T1	GW	LTnbs1	S	CMP	E300.0:NO3	3		
W-834-T1	GW	LTnbs1	Q	CMP	E624MOD:ALL	1	Y	
W-834-T1	GW	LTnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-834-T1	GW	LTnbs1	Q	CMP	E624MOD:ALL	3		
W-834-T1	GW	LTnbs1	Q	CMP	E624MOD:ALL	4		
W-834-T1	GW	LTnbs1	S	CMP	TBOS:ALL	1	Y	
W-834-T1	GW	LTnbs1	S	CMP	TBOS:ALL	3		
W-834-T11	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-T11	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-T11	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T11	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	DRY.
W-834-T2	PTMW	Tpsg	A	DIS	E200.7:FE	1	Y	
W-834-T2	PTMW	Tpsg	A	DIS	E200.8:MN	1	Y	
W-834-T2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T2	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-T2	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		

Table 2.2-6. Building 834 Operable Unit ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-834-T2	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-T2	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-T2A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T2A	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-T2A	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T2A	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-T2A	PTMW	Tpsg	E	CMP	TBOS:ALL	1	Y	
W-834-T2B	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-T2B	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-T2B	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T2B	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-T2C	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-T2C	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-T2C	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T2C	PTMW	Tpsg	E	CMP	TBOS:ALL	1	N	DRY.
W-834-T2D	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T2D	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	Y	
W-834-T2D	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T2D	PTMW	Tpsg	Q	DIS	LITEHCS+AC:ALL	2	Y	
W-834-T2D	PTMW	Tpsg	E	CMP	TBOS:ALL	1	Y	
W-834-T3	GW	LTnbs1	S	CMP	E300.0:NO3	1	Y	
W-834-T3	GW	LTnbs1	S	CMP	E300.0:NO3	3		
W-834-T3	GW	LTnbs1	Q	CMP	E624MOD:ALL	1	Y	
W-834-T3	GW	LTnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-834-T3	GW	LTnbs1	Q	CMP	E624MOD:ALL	3		
W-834-T3	GW	LTnbs1	Q	CMP	E624MOD:ALL	4		
W-834-T3	GW	LTnbs1	S	CMP	TBOS:ALL	1	Y	
W-834-T3	GW	LTnbs1	S	CMP	TBOS:ALL	3		
W-834-T5	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-834-T5	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-834-T5	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-T5	PTMW	Tps-Tnsc2	E	CMP	TBOS:ALL	1	Y	
W-834-T7A	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	N	DRY.
W-834-T7A	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-T7A	PTMW	Tps-Tnsc2	S	CMP	E624MOD:ALL	3		
W-834-T7A	PTMW	Tps-Tnsc2	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-T8A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-T8A	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-T8A	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T8A	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-T9	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	DRY.
W-834-T9	PTMW	Tpsg	S	CMP	E624MOD:ALL	1	N	DRY.
W-834-T9	PTMW	Tpsg	S	CMP	E624MOD:ALL	3		
W-834-T9	PTMW	Tpsg	O	CMP	TBOS:ALL	1	N	To be sampled in 2017.
W-834-U1	PTMW	Tps-Tnsc2	A	CMP	E300.0:NO3	1	N	No access to well location.
W-834-U1	PTMW	Tps-Tnsc2	S	CMP	E624:ALL	1	N	No access to well location.
W-834-U1	PTMW	Tps-Tnsc2	S	CMP	E624:ALL	3		
W-834-U1	PTMW	Tps-Tnsc2	A	CMP	TBOS:ALL	1	N	No access to well location.

Table 2.2-7. Building 834 (834) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
834	January	0	0	NA	0	NA	0
	February	260	22	NA	5.4	NA	0.0078
	March	350	30	NA	7.0	NA	0.0097
	April	280	51	NA	6.6	NA	0.0097
	May	360	77	NA	10	NA	0.016
	June	290	60	NA	7.4	NA	0.012
Total		1,500	240	NA	36	NA	0.055

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
BC6-10	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
BC6-10	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
BC6-10	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
BC6-10	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
BC6-10	PTMW	LTnbs1	S	CMP	E906:ALL	1	Y	
BC6-10	PTMW	LTnbs1	S	CMP	E906:ALL	3		
BC6-13	PTMW	Qt-Tnbs1	E	CMP	E300.0:NO3	1	N	DRY.
BC6-13	PTMW	Qt-Tnbs1	E	CMP	E300.0:PERC	1	N	DRY.
BC6-13	PTMW	Qt-Tnbs1	E	CMP	E624MOD:ALL	1	N	DRY.
BC6-13	PTMW	Qt-Tnbs1	E	CMP	E906:ALL	1	N	DRY.
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E624:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E624:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E624:ALL	3		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E624:ALL	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	1	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	2	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	3		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	4		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	3		

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW1	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	1	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	2	Y	
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	3		
CARNRW1	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	4		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	AS:UIISO	1	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	AS:UIISO	2	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	AS:UIISO	3		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	AS:UIISO	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E524.2MOD:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E524.2MOD:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E524.2MOD:ALL	3		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E524.2MOD:ALL	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	1	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	2	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	3		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E8330:R+H	4		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	3		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	E900:ALL	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW2	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	1	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	2	Y	
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	3		
CARNRW2	WS	Qt-Tnbs1	Q	WGMG	WGMGMET3:ALL	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW3	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:NO3	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E300.0:PERC	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E624MOD:ALL	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	1	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	2	Y	
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	3		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
CARNRW4	WS	Qt-Tnbs1	M	CMP	E906:ALL	4		
EP6-06	DMW	LTnbs1	A	WGMG	AS:UIISO	1	Y	
EP6-06	DMW	LTnbs1	A	WGMG	E210.2:ALL	1	Y	
EP6-06	DMW	LTnbs1	A	WGMG	E300.0:NO3	1	Y	
EP6-06	DMW	LTnbs1	A	WGMG	E300.0:PERC	1	Y	
EP6-06	DMW	LTnbs1	A	WGMG	E602:ALL	1	Y	
EP6-06	DMW	LTnbs1	S	WGMG	E624MOD:ALL	1	Y	
EP6-06	DMW	LTnbs1	S	WGMG	E624MOD:ALL	3		
EP6-06	DMW	LTnbs1	A	WGMG	E900:ALL	1	Y	
EP6-06	DMW	LTnbs1	S	WGMG	E906:ALL	1	Y	
EP6-06	DMW	LTnbs1	S	WGMG	E906:ALL	3		
EP6-07	PTMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	Y	
EP6-07	PTMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	Y	
EP6-07	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
EP6-07	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
EP6-07	PTMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	Y	
EP6-07	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
EP6-07	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
EP6-07	PTMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	Y	
EP6-07	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
EP6-07	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
EP6-08	DMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	A	WGMG	E300.0:NO3	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	A	WGMG	E300.0:PERC	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	3		
EP6-08	DMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	1	N	DRY.
EP6-08	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	3		
EP6-09	DMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	Y	
EP6-09	DMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	Y	
EP6-09	DMW	Qt-Tnbs1	A	WGMG	E300.0:NO3	1	Y	
EP6-09	DMW	Qt-Tnbs1	A	WGMG	E300.0:PERC	1	Y	
EP6-09	DMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	Y	
EP6-09	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	1	Y	
EP6-09	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	3		
EP6-09	DMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	Y	
EP6-09	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	1	Y	
EP6-09	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	3		
K6-01	DMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	Y	
K6-01	DMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	Y	
K6-01	DMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-01	DMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-01	DMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	Y	
K6-01	DMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-01	DMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K6-01	DMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	Y	
K6-01	DMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-01	DMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-01S	DMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	Y	
K6-01S	DMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	Y	
K6-01S	DMW	Qt-Tnbs1	A	WGMG	E300.0:NO3	1	Y	
K6-01S	DMW	Qt-Tnbs1	A	WGMG	E300.0:PERC	1	Y	
K6-01S	DMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	Y	
K6-01S	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	1	Y	
K6-01S	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	3		
K6-01S	DMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	Y	
K6-01S	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	1	Y	
K6-01S	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	3		
K6-03	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-03	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-03	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-03	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-03	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-03	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-04	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-04	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-04	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-04	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-04	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-04	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-14	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
K6-14	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
K6-14	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-14	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
K6-14	PTMW	LTnbs1	S	CMP	E906:ALL	1	Y	
K6-14	PTMW	LTnbs1	S	CMP	E906:ALL	3		
K6-15	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	N	DRY.
K6-15	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	N	DRY.
K6-15	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	N	DRY.
K6-15	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-15	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	N	DRY.
K6-15	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-16	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-16	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-16	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-16	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-16	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-16	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-17	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	1	Y	
K6-17	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	3		
K6-17	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	1	Y	
K6-17	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	3		
K6-17	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	1	Y	
K6-17	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	2	Y	
K6-17	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	3		
K6-17	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	4		
K6-17	GW	Qt-Tnbs1	Q	CMP	E906:ALL	1	Y	
K6-17	GW	Qt-Tnbs1	Q	CMP	E906:ALL	2	Y	
K6-17	GW	Qt-Tnbs1	Q	CMP	E906:ALL	3		
K6-17	GW	Qt-Tnbs1	Q	CMP	E906:ALL	4		
K6-17	GW	Qt-Tnbs1	S	WGMG	SM9221:ALL	1	Y	
K6-17	GW	Qt-Tnbs1	S	WGMG	SM9221:ALL	3		

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K6-18	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-18	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-18	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-18	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-18	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-18	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-19	DMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	Y	
K6-19	DMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	Y	
K6-19	DMW	Qt-Tnbs1	A	WGMG	E300.0:NO3	1	Y	
K6-19	DMW	Qt-Tnbs1	A	WGMG	E300.0:PERC	1	Y	
K6-19	DMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	Y	
K6-19	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	1	Y	
K6-19	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	3		
K6-19	DMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	Y	
K6-19	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	1	Y	
K6-19	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	3		
K6-21	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	N	DRY.
K6-21	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	N	DRY.
K6-21	PTMW	LTnbs1	A	CMP	E624MOD:ALL	1	N	DRY.
K6-21	PTMW	LTnbs1	A	CMP	E906:ALL	1	N	DRY.
K6-22	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	1	Y	
K6-22	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	3		
K6-22	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	1	Y	
K6-22	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	3		
K6-22	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	1	Y	
K6-22	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	2	N	No well access for sampling or measurement.
K6-22	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	3		
K6-22	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	4		
K6-22	GW	Qt-Tnbs1	Q	CMP	E906:ALL	1	Y	
K6-22	GW	Qt-Tnbs1	Q	CMP	E906:ALL	2	N	No well access for sampling or measurement.
K6-22	GW	Qt-Tnbs1	Q	CMP	E906:ALL	3		
K6-22	GW	Qt-Tnbs1	Q	CMP	E906:ALL	4		
K6-23	PTMW	Qt-Tnbs1	S	CMP	E300.0:NO3	1	Y	
K6-23	PTMW	Qt-Tnbs1	S	CMP	E300.0:NO3	3		
K6-23	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-23	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-23	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-23	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-23	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-23	PTMW	Qt-Tnbs1	S	WGMG	SM9221:ALL	1	Y	
K6-23	PTMW	Qt-Tnbs1	S	WGMG	SM9221:ALL	3		
K6-24	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	N	Insufficient water.
K6-24	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	N	Insufficient water.
K6-24	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	N	Insufficient water.
K6-24	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-24	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	N	Insufficient water.
K6-24	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-25	PTMW	Tmss	A	CMP	E300.0:NO3	1	Y	
K6-25	PTMW	Tmss	A	CMP	E300.0:PERC	1	Y	
K6-25	PTMW	Tmss	S	CMP	E624MOD:ALL	1	Y	
K6-25	PTMW	Tmss	S	CMP	E624MOD:ALL	3		
K6-25	PTMW	Tmss	S	CMP	E906:ALL	1	Y	
K6-25	PTMW	Tmss	S	CMP	E906:ALL	3		
K6-26	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
K6-26	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
K6-26	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-26	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K6-26	PTMW	LTnbs1	S	CMP	E906:ALL	1	Y	
K6-26	PTMW	LTnbs1	S	CMP	E906:ALL	3		
K6-27	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-27	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-27	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-27	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-27	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-27	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-32	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	N	DRY.
K6-32	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	N	DRY.
K6-32	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	N	DRY.
K6-32	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-32	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	N	DRY.
K6-32	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-33	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-33	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-33	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-33	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-33	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-33	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-34	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	1	Y	
K6-34	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	3		
K6-34	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	1	Y	
K6-34	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	3		
K6-34	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	1	Y	
K6-34	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	2	Y	
K6-34	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	3		
K6-34	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	4		
K6-34	GW	Qt-Tnbs1	Q	CMP	E906:ALL	1	Y	
K6-34	GW	Qt-Tnbs1	Q	CMP	E906:ALL	2	Y	
K6-34	GW	Qt-Tnbs1	Q	CMP	E906:ALL	3		
K6-34	GW	Qt-Tnbs1	Q	CMP	E906:ALL	4		
K6-35	PTMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	Y	
K6-35	PTMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	Y	
K6-35	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
K6-35	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
K6-35	PTMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	Y	
K6-35	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
K6-35	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
K6-35	PTMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	Y	
K6-35	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
K6-35	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
K6-36	DMW	Qt-Tnbs1	A	WGMG	AS:UIISO	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	A	WGMG	E210.2:ALL	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	A	WGMG	E300.0:NO3	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	A	WGMG	E300.0:PERC	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	A	WGMG	E602:ALL	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	S	WGMG	E624MOD:ALL	3		
K6-36	DMW	Qt-Tnbs1	A	WGMG	E900:ALL	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	1	N	DRY.
K6-36	DMW	Qt-Tnbs1	S	WGMG	E906:ALL	3		
W-33C-01	PTMW	Tts	A	CMP	E300.0:NO3	1	Y	
W-33C-01	PTMW	Tts	A	CMP	E300.0:PERC	1	Y	
W-33C-01	PTMW	Tts	S	CMP	E624MOD:ALL	1	Y	
W-33C-01	PTMW	Tts	S	CMP	E624MOD:ALL	3		
W-33C-01	PTMW	Tts	S	CMP	E906:ALL	1	Y	

Table 2.3-1. Pit 6 Landfill Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-33C-01	PTMW	Tts	S	CMP	E906:ALL	3		
SPRING15	SPR	Qt-Tnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
SPRING15	SPR	Qt-Tnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
SPRING15	SPR	Qt-Tnbs1	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
SPRING15	SPR	Qt-Tnbs1	O	CMP	E906:ALL	1	N	To be sampled in 2017.
SPRING15	SPR	Qt-Tnbs1	Q	WGMG	NUTRIENTS:ALL	1	N	DRY.
SPRING15	SPR	Qt-Tnbs1	Q	WGMG	NUTRIENTS:ALL	2	N	DRY.
SPRING15	SPR	Qt-Tnbs1	Q	WGMG	NUTRIENTS:ALL	3		
SPRING15	SPR	Qt-Tnbs1	Q	WGMG	NUTRIENTS:ALL	4		
W-PIT6-1819	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	1	Y	
W-PIT6-1819	GW	Qt-Tnbs1	S	CMP	E300.0:NO3	3		
W-PIT6-1819	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	1	Y	
W-PIT6-1819	GW	Qt-Tnbs1	S	CMP	E300.0:PERC	3		
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	1	Y	
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	3		
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E624MOD:ALL	4		
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E906:ALL	1	Y	
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E906:ALL	2	Y	
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E906:ALL	3		
W-PIT6-1819	GW	Qt-Tnbs1	Q	CMP	E906:ALL	4		
W-PIT6-2816	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
W-PIT6-2816	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
W-PIT6-2816	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
W-PIT6-2816	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
W-PIT6-2816	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
W-PIT6-2816	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		
W-PIT6-2817	PTMW	Qt-Tnbs1	A	CMP	E300.0:NO3	1	Y	
W-PIT6-2817	PTMW	Qt-Tnbs1	A	CMP	E300.0:PERC	1	Y	
W-PIT6-2817	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	1	Y	
W-PIT6-2817	PTMW	Qt-Tnbs1	S	CMP	E624MOD:ALL	3		
W-PIT6-2817	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	1	Y	
W-PIT6-2817	PTMW	Qt-Tnbs1	S	CMP	E906:ALL	3		

Table 2.4-1. Building 815-Source (815-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
815-SRC	January	NA	0	NA	0
	February	NA	501	NA	40,562
	March	NA	639	NA	50,132
	April	NA	693	NA	54,539
	May	NA	788	NA	63,090
	June	NA	717	NA	59,828
Total		NA	3,338	NA	268,151

Table 2.4-2. Building 815-Proximal (815-PRX) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
815-PRX	January	NA	0	NA	0
	February	NA	0	NA	0
	March	NA	0	NA	0
	April	NA	0	NA	0
	May	NA	210	NA	34,013
	June	NA	694	NA	88,753
Total		NA	904	NA	122,766

Table 2.4-3. Building 815-Distal Site Boundary (815-DSB) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
815-DSB	January	NA	718	NA	126,679
	February	NA	768	NA	137,272
	March	NA	719	NA	135,036
	April	NA	696	NA	128,139
	May	NA	792	NA	144,336
	June	NA	719	NA	129,996
Total		NA	4,412	NA	801,458

Table 2.4-4. Building 817-Source (817-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
817-SRC	January	NA	0	NA	0
	February	NA	0	NA	0
	March	NA	0	NA	0
	April	NA	0	NA	0
	May	NA	0	NA	46
	June	NA	6	NA	340
Total		NA	6	NA	386

Table 2.4-5. Building 817-Proximal (817-PRX) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
817-PRX	January	NA	0	NA	0
	February	NA	481	NA	41,816
	March	NA	507	NA	40,739
	April	NA	613	NA	49,508
	May	NA	465	NA	36,199
	June	NA	567	NA	47,340
Total		NA	2,633	NA	215,602

Table 2.4-6. Building 829-Source (829-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
829-SRC	January	NA	0	NA	0
	February	NA	331	NA	2
	March	NA	719	NA	175
	April	NA	606	NA	153
	May	NA	792	NA	183
	June	NA	720	NA	165
Total		NA	3,168	NA	678

Table 2.4-7. High Explosives Process Area Operable Unit volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2- DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
Building 815-Distal Site Boundary															
815-DSB-I	1/11/16	7.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-I	4/5/16	6.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-E	1/11/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-E	2/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-E	3/1/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-E	4/5/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-E	5/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-DSB-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 815-Proximal^a															
815-PRX-I	5/3/16	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-PRX-I	5/16/16	17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-PRX-E	5/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-PRX-E	5/16/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-PRX-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 815-Source^b															
815-SRC-I	2/9/16	4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.54	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-I	4/4/16	4.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.57	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-E	2/9/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-E	3/1/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-E	4/4/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-E	5/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Table 2.4-7 (Con't). High Explosives Process Area Operable Unit volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2- DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
Building 817-Proximal^b															
817-PRX-I	2/16/16	7.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-PRX-I	4/4/16	6.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-PRX-E	2/16/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-PRX-E	3/9/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-PRX-E	4/4/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-PRX-E	5/11/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-PRX-E	6/13/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 817-Source^c															
817-SRC-I	6/14/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
817-SRC-E	6/14/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 829-Source^d															
829-SRC-I	2/16/16	27	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
829-SRC-I	4/11/16	19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

^a No samples collected until May 2016 due to system shutdown for construction activities.

^b No samples collected in January due to shut down for freeze protection.

^c No samples collected until June due to system shutdown for extraction well evaluation and repair.

^d Only influent sampling required quarterly. Extracted water from 829-SRC is treated at 815-SRC.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.4-7 (Con't). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 815-Distal Site Boundary		
815-DSB-I	1/11/16	0 of 18
815-DSB-I	4/5/16	0 of 18
815-DSB-E	1/11/16	0 of 18
815-DSB-E	2/3/16	0 of 18
815-DSB-E	3/1/16	0 of 18
815-DSB-E	4/5/16	0 of 18
815-DSB-E	5/3/16	0 of 18
815-DSB-E	6/6/16	0 of 18
Building 815-Proximal^a		
815-PRX-I	5/3/16	0 of 18
815-PRX-I	5/16/16	0 of 18
815-PRX-E	5/3/16	0 of 18
815-PRX-E	5/16/16	0 of 18
815-PRX-E	6/6/16	0 of 18
Building 815-Source^b		
815-SRC-I	2/9/16	0 of 18
815-SRC-I	4/4/16	0 of 18
815-SRC-E	2/9/16	0 of 18
815-SRC-E	3/1/16	0 of 18
815-SRC-E	4/4/16	0 of 18
815-SRC-E	5/3/16	0 of 18
815-SRC-E	6/6/16	0 of 18
Building 817-Proximal^b		
817-PRX-I	2/16/16	0 of 18
817-PRX-I	4/4/16	0 of 18
817-PRX-E	2/16/16	0 of 18
817-PRX-E	3/9/16	0 of 18
817-PRX-E	4/4/16	0 of 18
817-PRX-E	5/11/16	0 of 18
817-PRX-E	6/13/16	0 of 18
Building 817-Source^c		
817-SRC-I	6/14/16	0 of 18
817-SRC-E	6/14/16	0 of 18
Building 829-Source^d		
829-SRC-I	2/16/16	0 of 18
829-SRC-I	4/11/16	0 of 18

Notes:

^a No samples collected until May 2016 due to system shutdown for construction activities.

^b No samples collected in January due to shut down for freeze protection.

^c No samples collected until June due to system shutdown for extraction well evaluation and repair.

^d Only influent sampling required quarterly. Extracted water from 829-SRC is treated at 815-SRC.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.4-8. High Explosives Process Area Operable Unit nitrate and perchlorate in ground water extraction and treatment system influent and effluent.

Location	Date	Nitrate as NO ₃ (mg/L)	Perchlorate (µg/L)
Building 815-Distal Site Boundary			
815-DSB-I	1/11/16	<1 D	-
815-DSB-I	4/5/16	<1 D	-
Building 815-Proximal^a			
815-PRX-I	5/3/16	82 D	5.6
815-PRX-I	5/16/16	81 D	5.9
815-PRX-E	5/3/16	-	<4
815-PRX-E	5/16/16	-	<4
815-PRX-E	6/6/16	-	<4
Building 815-Source^b			
815-SRC-I	2/9/16	99 D	<4
815-SRC-I	4/4/16	100 D	<4
815-SRC-E	2/9/16	-	<4
815-SRC-E	3/1/16	-	<4
815-SRC-E	4/4/16	-	<4
815-SRC-E	5/3/16	-	<4
815-SRC-E	6/6/16	-	<4
Building 817-Proximal^{b,c}			
817-PRX-I	2/16/16	96 D	18
817-PRX-I	4/4/16	95 D	16
817-PRX-E	2/16/16	-	<4
817-PRX-E	3/9/16	-	8.5
817-PRX-E	3/11/16	-	<4
817-PRX-E	3/22/16	-	<2
817-PRX-E	3/23/16	-	<2
817-PRX-E	4/4/16	-	<4
817-PRX-E	5/11/16	-	<4
817-PRX-E	6/13/16	-	<4
Building 817-Source^d			
817-SRC-I	6/14/16	-	23 D
817-SRC-E	6/14/16	-	<4
Building 829-Source^e			
829-SRC-I	2/16/16	64 D	9
829-SRC-I	4/11/16	68 D	10

Notes appear on the following page.

Table 2.4-8 (Con't.). High Explosives Process Area Operable Unit nitrate and perchlorate in ground water extraction and treatment system influent and effluent.

Notes:

^a No samples collected until May 2016 due to system shutdown for construction activities.

^b No samples collected in January due to shut down for freeze protection.

^c Extra effluent samples collected due to detection of perchlorate on 3/9/16.

^d No samples collected until June due to system shutdown for extraction well evaluation and repair.

^e Only influent sampling required quarterly. Extracted water from 829-SRC is treated at 815-SRC.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.4-9. High Explosives Process Area Operable Unit high explosive compounds in ground water extraction and treatment system influent and effluent.

Location	Date	1,3,5-Trinitrobenzene (µg/L)	1,3-Dinitrobenzene (µg/L)	2,4-Dinitrobenzene (µg/L)	2,6-Dinitrobenzene (µg/L)	2-Amino-4,6-dinitrotoluene (µg/L)	2-Nitrotoluene (µg/L)	3-Nitrotoluene (µg/L)	4-Amino-2,6-dinitrotoluene (µg/L)	4-Nitrotoluene (µg/L)	HMX (µg/L)	Nitrobenzene (µg/L)	RDX (µg/L)	TNT (µg/L)
Building 815-Source^a														
815-SRC-I	2/9/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	5.1	<2	29	2.4
815-SRC-I	4/4/16	<2 O	<2 O	<2	<2	<2	<2.2	<2	<2	<2.1	5.9	<2	30 O	<2 O
815-SRC-E	2/9/16	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1	<2
815-SRC-E	3/1/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	<1	<2
815-SRC-E	4/4/16	<2 O	<2 O	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	<1 O	<2 O
815-SRC-E	5/3/16	<2	<2	<2	<2	<2	<2.3	<2	<2	<2.2	<1	<2	<1	<2
815-SRC-E	6/6/16	<2	<2	<2	<2.1	<2 O	<2.6	<2	<2	<2.5	<1	<2	<1	<2
Building 817-Proximal^a														
817-PRX-I	2/16/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	10	<2
817-PRX-I	4/4/16	<2	<2	<2	<2	<2	<2.2	<2	<2	<2.2	<1	<2	14	<2
817-PRX-E	2/16/16	<2	<2	<2	<2	<2	<2.3	<2	<2	<2.2	<1	<2	<1	<2
817-PRX-E	3/9/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	<1	<2
817-PRX-E	4/4/16	<2 O	<2 O	<2	<2	<2	<2.2	<2	<2	<2.1	<1	<2	<1 O	<2 O
817-PRX-E	5/11/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	<1	<2
817-PRX-E	6/13/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	<1	<2
Building 817-Source^b														
817-SRC-I	6/14/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	24	<2	44	<2
817-SRC-E	6/14/16	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1	<2
Building 829-Source^c														
829-SRC-I	2/16/16	<2	<2	<2	<2.1	<2	<2.6	<2	<2	<2.5	<1	<2	<1	<2

Notes:^a No samples collected in January due to shut down for freeze protection.^b No samples collected until June due to system shutdown for extraction well evaluation and repair.^c Only influent sampling required annually. Extracted water from 829-SRC is treated at 815-SRC.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.4-10. High Explosives Process Area Operable Unit treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
<i>815-SRC GWTS</i>			
Influent Port	815-SRC-I	VOCs	Quarterly
		HE Compounds	Quarterly
		Perchlorate	Quarterly
Effluent Port	815-SRC-E	VOCs	Monthly
		HE Compounds	Monthly
		Perchlorate	Monthly
		pH	Monthly
<i>815-PRX GWTS</i>			
Influent Port	815-PRX-I	VOCs	Quarterly
		Perchlorate	Quarterly
Effluent Port	815-PRX-E	VOCs	Monthly
		HE Compounds	Quarterly
		Perchlorate	Monthly
		pH	Monthly
<i>815-DSB GWTS</i>			
Influent Port	815-DSB-I	VOCs	Quarterly
Effluent Port	815-DSB-E	VOCs	Monthly
		pH	Monthly
<i>817-SRC GWTS</i>			
Influent Port	W-817-01-817-SRC-I	VOCs	Quarterly
		HE Compounds	Quarterly
		Perchlorate	Quarterly
Effluent Port	817-SRC-E	VOCs	Monthly
		HE Compounds	Monthly
		Perchlorate	Monthly
		pH	Monthly

Table 2.4-10 (Con't.). High Explosives Process Area Operable Unit treatment facility sampling and analysis plans.

Sample location	Sample identification	Parameter	Frequency
<i>817-PRX GWTS</i>			
Influent Port	817-PRX-I	VOCs	Quarterly
		HE Compounds	Quarterly
		Perchlorate	Quarterly
Effluent Port	817-PRX-E	VOCs	Monthly
		HE Compounds	Monthly
		Perchlorate	Monthly
		pH	Monthly
<i>829-SRC GWTS</i>			
Influent Port	W-829-06-829-SRC-I	VOCs	Quarterly
		Perchlorate	Quarterly
		Nitrate	Quarterly
Effluent Port ^a	829-SRC-E	NA	NA

Notes:

^a Effluent monitoring no longer required due to extracted water being treated at 815-SRC GWTS.

One duplicate and one blank (given fictitious labels) shall be taken for every 12 samples.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	3		
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	3		
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	3		
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	4		
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	4		
GALLO1	WS	Tnbs2	M	CMP	E300.0:NO3	4		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	3		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	3		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	3		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	4		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	4		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	4		
GALLO1	WS	Tnbs2	M	CMP	E300.0:PERC	4		
GALLO1	WS	Tnbs2	Q	WGMG	E524.2MOD:ALL	1	Y	
GALLO1	WS	Tnbs2	Q	WGMG	E524.2MOD:ALL	2	Y	
GALLO1	WS	Tnbs2	Q	WGMG	E524.2MOD:ALL	3		
GALLO1	WS	Tnbs2	Q	WGMG	E524.2MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E624MOD:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	1	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	2	Y	
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	3		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	4		
GALLO1	WS	Tnbs2	M	CMP	E8330LOW:ALL	4		
SPRING14	SPR	Tpsg-Tps	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
SPRING14	SPR	Tpsg-Tps	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
SPRING14	SPR	Tpsg-Tps	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
SPRING14	SPR	Tpsg-Tps	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
SPRING5	SPR	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	DRY.
SPRING5	SPR	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	DRY.
SPRING5	SPR	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	DRY.
SPRING5	SPR	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
SPRING5	SPR	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	N	DRY.
W-35B-01	GW	Qal/WBR	S	CMP	E300.0:NO3	1	Y	
W-35B-01	GW	Qal/WBR	S	CMP	E300.0:NO3	3		
W-35B-01	GW	Qal/WBR	S	CMP	E300.0:PERC	1	Y	
W-35B-01	GW	Qal/WBR	S	CMP	E300.0:PERC	3		
W-35B-01	GW	Qal/WBR	Q	CMP	E624MOD:ALL	1	Y	
W-35B-01	GW	Qal/WBR	Q	CMP	E624MOD:ALL	2	Y	

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-35B-01	GW	Qal/WBR	Q	CMP	E624MOD:ALL	3		
W-35B-01	GW	Qal/WBR	Q	CMP	E624MOD:ALL	4		
W-35B-01	GW	Qal/WBR	S	CMP	E8330LOW:ALL	1	Y	
W-35B-01	GW	Qal/WBR	S	CMP	E8330LOW:ALL	3		
W-35B-02	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-35B-02	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-35B-02	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-35B-02	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-35B-02	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-35B-02	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-35B-02	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-35B-02	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-35B-02	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-35B-02	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-35B-03	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-35B-03	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-35B-03	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-35B-03	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-35B-03	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-35B-03	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-35B-03	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-35B-03	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-35B-03	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-35B-03	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-35B-04	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-35B-04	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-35B-04	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-35B-04	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-35B-04	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-35B-04	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-35B-04	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-35B-04	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-35B-04	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-35B-04	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-35B-05	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-35B-05	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-35B-05	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-35B-05	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-35B-05	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-35B-05	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-35B-05	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-35B-05	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-35B-05	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-35B-05	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-35C-01	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-35C-01	PTMW	Tpsg-Tps	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-35C-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-35C-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-35C-01	PTMW	Tpsg-Tps	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-35C-02	PTMW	Tnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-35C-02	PTMW	Tnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-35C-02	PTMW	Tnbs1	S	CMP	E624MOD:ALL	1	Y	
W-35C-02	PTMW	Tnbs1	S	CMP	E624MOD:ALL	3		
W-35C-02	PTMW	Tnbs1	A	CMP	E8330LOW:ALL	1	Y	
W-35C-04	EW	Tnbs2	O	CMP-TF	E300.0:NO3	1	N	To be sampled in 2017.
W-35C-04	EW	Tnbs2	O	CMP-TF	E300.0:PERC	1	N	To be sampled in 2017.
W-35C-04	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-35C-04	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-35C-04	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-35C-04	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-35C-04	EW	Tnbs2	O	CMP-TF	E8330LOW:ALL	1	N	To be sampled in 2017.
W-35C-05	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-35C-05	PTMW	Tpsg-Tps	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-35C-05	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-35C-05	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-35C-05	PTMW	Tpsg-Tps	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-35C-06	PTMW	Qal/WBR	E	CMP	E300.0:NO3	1	Y	

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-35C-06	PTMW	Qal/WBR	E	CMP	E300.0:PERC	1	Y	
W-35C-06	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
W-35C-06	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-35C-06	PTMW	Qal/WBR	E	CMP	E8330LOW:ALL	1	Y	
W-35C-07	PTMW	Tnsc2	E	CMP	E300.0:NO3	1	Y	
W-35C-07	PTMW	Tnsc2	E	CMP	E300.0:PERC	1	Y	
W-35C-07	PTMW	Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-35C-07	PTMW	Tnsc2	S	CMP	E624MOD:ALL	3		
W-35C-07	PTMW	Tnsc2	E	CMP	E8330LOW:ALL	1	Y	
W-35C-08	PTMW	Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-35C-08	PTMW	Tnsc2	A	CMP	E300.0:PERC	1	Y	
W-35C-08	PTMW	Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-35C-08	PTMW	Tnsc2	S	CMP	E624MOD:ALL	3		
W-35C-08	PTMW	Tnsc2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-4A	PTMW	Tnbs2	E	CMP	E300.0:NO3	1	Y	
W-4A	PTMW	Tnbs2	E	CMP	E300.0:PERC	1	Y	
W-4A	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-4A	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-4A	PTMW	Tnbs2	E	CMP	E8330LOW:ALL	1	Y	
W-4AS	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-4AS	PTMW	Tpsg-Tps	E	CMP	E300.0:PERC	1	Y	
W-4AS	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-4AS	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-4AS	PTMW	Tpsg-Tps	E	CMP	E8330LOW:ALL	1	Y	
W-4B	PTMW	Tnbs2	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-4B	PTMW	Tnbs2	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-4B	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-4B	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-4B	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-4C	GW	Tnsc1b	S	CMP	E300.0:NO3	1	Y	
W-4C	GW	Tnsc1b	S	CMP	E300.0:NO3	3		
W-4C	GW	Tnsc1b	S	CMP	E300.0:PERC	1	Y	
W-4C	GW	Tnsc1b	S	CMP	E300.0:PERC	3		
W-4C	GW	Tnsc1b	Q	CMP	E624MOD:ALL	1	Y	
W-4C	GW	Tnsc1b	Q	CMP	E624MOD:ALL	2	Y	
W-4C	GW	Tnsc1b	Q	CMP	E624MOD:ALL	3		
W-4C	GW	Tnsc1b	Q	CMP	E624MOD:ALL	4		
W-6BD	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-6BD	PTMW	Tpsg-Tps	E	CMP	E300.0:PERC	1	Y	
W-6BD	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-6BD	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-6BD	PTMW	Tpsg-Tps	E	CMP	E8330LOW:ALL	1	Y	
W-6BS	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	Y	
W-6BS	PTMW	Qal/WBR	E	CMP	E300.0:PERC	1	Y	
W-6BS	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
W-6BS	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-6BS	PTMW	Qal/WBR	E	CMP	E8330LOW:ALL	1	Y	
W-6CD	PTMW	Tnbs2	E	CMP	E300.0:NO3	1	Y	
W-6CD	PTMW	Tnbs2	E	CMP	E300.0:PERC	1	Y	
W-6CD	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-6CD	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-6CD	PTMW	Tnbs2	E	CMP	E8330LOW:ALL	1	Y	
W-6CI	PTMW	Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-6CI	PTMW	Tnsc2	A	CMP	E300.0:PERC	1	Y	
W-6CI	PTMW	Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-6CI	PTMW	Tnsc2	S	CMP	E624MOD:ALL	3		
W-6CI	PTMW	Tnsc2	A	CMP	E8330LOW:ALL	1	Y	
W-6CS	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-6CS	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	
W-6CS	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-6CS	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-6CS	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	Y	
W-6EI	PTMW	Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-6EI	PTMW	Tnsc2	A	CMP	E300.0:PERC	1	Y	
W-6EI	PTMW	Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-6EI	PTMW	Tnsc2	S	CMP	E624MOD:ALL	3		
W-6EI	PTMW	Tnsc2	A	CMP	E8330LOW:ALL	1	Y	

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-6ER	EW	Tnbs2	O	CMP-TF	E300.0:NO3	1	N	To be sampled in 2017.
W-6ER	EW	Tnbs2	O	CMP-TF	E300.0:PERC	1	N	To be sampled in 2017.
W-6ER	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-6ER	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-6ER	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-6ER	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-6ER	EW	Tnbs2	O	CMP-TF	E8330LOW:ALL	1	N	To be sampled in 2017.
W-6ES	PTMW	Qal/WBR	E	CMP	E300.0:NO3	1	Y	
W-6ES	PTMW	Qal/WBR	E	CMP	E300.0:PERC	1	Y	
W-6ES	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
W-6ES	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-6ES	PTMW	Qal/WBR	E	CMP	E8330LOW:ALL	1	Y	
W-6F	PTMW	Tnsc2	A	CMP	E300.0:NO3	1	N	No access to well location.
W-6F	PTMW	Tnsc2	A	CMP	E300.0:PERC	1	N	No access to well location.
W-6F	PTMW	Tnsc2	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-6F	PTMW	Tnsc2	S	CMP	E624MOD:ALL	3		
W-6F	PTMW	Tnsc2	A	CMP	E8330LOW:ALL	1	N	No access to well location.
W-6G	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-6G	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-6G	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-6G	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-6G	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-6H	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-6H	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-6H	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-6H	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-6H	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-6H	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-6H	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-6H	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-6H	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-6H	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-6I	PTMW	Tpsg-Tps	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-6I	PTMW	Tpsg-Tps	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-6I	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-6I	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-6I	PTMW	Tpsg-Tps	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-6J	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-6J	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-6J	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-6J	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-6J	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-6J	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-6J	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-6J	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-6J	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-6J	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-6K	PTMW	Tnbs2	E	CMP	E300.0:NO3	1	Y	
W-6K	PTMW	Tnbs2	E	CMP	E300.0:PERC	1	Y	
W-6K	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-6K	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-6K	PTMW	Tnbs2	E	CMP	E8330LOW:ALL	1	Y	
W-6L	PTMW	Tnbs2	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-6L	PTMW	Tnbs2	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-6L	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-6L	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-6L	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-806-06A	PTMW	Tnsc1b	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-806-06A	PTMW	Tnsc1b	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-806-06A	PTMW	Tnsc1b	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
W-806-06A	PTMW	Tnsc1b	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-806-07	PTMW	Tnbs2	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-806-07	PTMW	Tnbs2	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-806-07	PTMW	Tnbs2	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
W-806-07	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-808-01	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-808-01	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-808-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-808-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-808-01	PTMW	Tpsg-Tps	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-808-02	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	DRY.
W-808-02	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	DRY.
W-808-02	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	DRY.
W-808-02	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-808-02	PTMW	Tpsg-Tps	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-808-03	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	Y	
W-808-03	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	Y	
W-808-03	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-808-03	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-808-03	PTMW	UTnbs1	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-809-01	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-809-01	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	
W-809-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-809-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-809-01	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	Y	
W-809-02	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-809-02	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-809-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-809-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-809-02	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-809-03	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-809-03	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-809-03	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-809-03	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-809-03	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-809-04	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	DRY.
W-809-04	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	DRY.
W-809-04	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	DRY.
W-809-04	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-809-04	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	N	DRY.
W-810-01	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	N	No access to well location.
W-810-01	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	N	No access to well location.
W-810-01	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-810-01	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-810-01	PTMW	UTnbs1	A	CMP	E8330LOW:ALL	1	N	No access to well location.
W-814-01	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-814-01	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	
W-814-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-814-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-814-01	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	Y	
W-814-02	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-814-02	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-814-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-814-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-814-02	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-814-03	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	DRY.
W-814-03	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	DRY.
W-814-03	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	DRY.
W-814-03	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-814-03	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	N	DRY.
W-814-04	GW	Tnsc1b	S	CMP	E300.0:NO3	1	Y	
W-814-04	GW	Tnsc1b	S	CMP	E300.0:NO3	3		
W-814-04	GW	Tnsc1b	S	CMP	E300.0:PERC	1	Y	
W-814-04	GW	Tnsc1b	S	CMP	E300.0:PERC	3		
W-814-04	GW	Tnsc1b	Q	CMP	E624MOD:ALL	1	Y	
W-814-04	GW	Tnsc1b	Q	CMP	E624MOD:ALL	2	Y	
W-814-04	GW	Tnsc1b	Q	CMP	E624MOD:ALL	3		
W-814-04	GW	Tnsc1b	Q	CMP	E624MOD:ALL	4		
W-814-2138	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-814-2138	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	
W-814-2138	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-814-2138	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-814-2138	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	Y	
W-815-01	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	DRY.

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-815-01	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	DRY.
W-815-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	DRY.
W-815-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-815-01	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	N	DRY.
W-815-02	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	Y	
W-815-02	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	Y	
W-815-02	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-815-02	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-815-02	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-815-02	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-815-02	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-815-02	EW	Tnbs2	A	CMP-TF	E8330LOW:ALL	1	Y	
W-815-02	EW	Tnbs2	A	DIS-TF	E8330LOW:ALL	3		
W-815-03	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	DRY.
W-815-03	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	DRY.
W-815-03	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	DRY.
W-815-03	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-815-03	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	N	DRY.
W-815-04	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	Y	
W-815-04	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	Y	
W-815-04	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-815-04	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-815-04	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-815-04	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-815-04	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-815-04	EW	Tnbs2	A	CMP-TF	E8330LOW:ALL	1	Y	
W-815-04	EW	Tnbs2	A	DIS-TF	E8330LOW:ALL	3		
W-815-06	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	Inoperable equipment.
W-815-06	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	N	Inoperable equipment.
W-815-06	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	Inoperable equipment.
W-815-06	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-815-06	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	N	Inoperable equipment.
W-815-07	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-815-07	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-815-07	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-815-07	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-815-07	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-815-08	PTMW	UTnbs1	E	CMP	E300.0:NO3	1	Y	
W-815-08	PTMW	UTnbs1	E	CMP	E300.0:PERC	1	Y	
W-815-08	PTMW	UTnbs1	A	CMP	E624MOD:ALL	1	Y	
W-815-08	PTMW	UTnbs1	E	CMP	E8330LOW:ALL	1	Y	
W-815-1928	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-815-1928	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	
W-815-1928	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-815-1928	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-815-1928	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	Y	
W-815-2110	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-815-2110	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-815-2110	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-815-2110	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-815-2110	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-815-2110	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-815-2110	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-815-2110	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-815-2110	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-815-2110	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-815-2111	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-815-2111	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-815-2111	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-815-2111	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-815-2111	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-815-2111	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-815-2111	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-815-2111	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-815-2111	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-815-2111	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-815-2217	PTMW	Tnbs2	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-815-2217	PTMW	Tnbs2	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-815-2217	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-815-2217	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-815-2217	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-815-2608	EW	Tnbs2	O	CMP-TF	E300.0:NO3	1	N	To be sampled in 2017.
W-815-2608	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	Y	
W-815-2608	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-815-2608	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-815-2608	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-815-2608	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-815-2608	EW	Tnbs2	O	CMP-TF	E8330LOW:ALL	1	N	To be sampled in 2017.
W-815-2621	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-815-2621	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-815-2621	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-815-2621	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-815-2621	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-815-2803	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	Y	
W-815-2803	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	Y	
W-815-2803	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-815-2803	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-815-2803	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-815-2803	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-815-2803	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-815-2803	EW	Tnbs2	A	CMP-TF	E8330LOW:ALL	1	Y	
W-815-2803	EW	Tnbs2	A	DIS-TF	E8330LOW:ALL	3		
W-817-01	EW	Tnbs2	A	DIS-TF	AS:UIISO	2	Y	
W-817-01	EW	Tnbs2	A	DIS-TF	E300.0:NO3	1	N	Inoperable equipment.
W-817-01	EW	Tnbs2	Q	DIS-TF	E300.0:PERC	1	N	Inoperable equipment.
W-817-01	EW	Tnbs2	Q	DIS-TF	E300.0:PERC	2	Y	
W-817-01	EW	Tnbs2	Q	DIS-TF	E300.0:PERC	3		
W-817-01	EW	Tnbs2	Q	DIS-TF	E300.0:PERC	4		
W-817-01	EW	Tnbs2	Q	DIS-TF	E624MOD:ALL	1	N	Inoperable equipment.
W-817-01	EW	Tnbs2	Q	DIS-TF	E624MOD:ALL	2	Y	
W-817-01	EW	Tnbs2	Q	DIS-TF	E624MOD:ALL	3		
W-817-01	EW	Tnbs2	Q	DIS-TF	E624MOD:ALL	4		
W-817-01	EW	Tnbs2	Q	DIS-TF	E8330LOW:ALL	1	N	Inoperable equipment.
W-817-01	EW	Tnbs2	Q	DIS-TF	E8330LOW:ALL	2	Y	
W-817-01	EW	Tnbs2	Q	DIS-TF	E8330LOW:ALL	3		
W-817-01	EW	Tnbs2	Q	DIS-TF	E8330LOW:ALL	4		
W-817-03	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	Y	
W-817-03	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	Y	
W-817-03	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-817-03	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	Y	
W-817-03	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-817-03	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-817-03	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-817-03	EW	Tnbs2	A	CMP-TF	E8330LOW:ALL	1	Y	
W-817-03	EW	Tnbs2	A	DIS-TF	E8330LOW:ALL	3		
W-817-03A	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	Y	
W-817-03A	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	Y	
W-817-03A	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	Y	
W-817-03A	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-817-03A	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	Y	
W-817-04	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-817-04	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-817-04	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-817-04	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-817-04	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-817-05	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-817-05	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-817-05	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-817-05	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-817-05	PTMW	Tnsc1b	A	CMP	E8330LOW:ALL	1	Y	
W-817-07	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-817-07	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	N	Insufficient water.
W-817-07	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-817-07	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-817-07	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	N	Insufficient water.
W-817-2318	EW	Tpsg-Tps	A	CMP-TF	E300.0:NO3	1	Y	
W-817-2318	EW	Tpsg-Tps	A	CMP-TF	E300.0:PERC	1	Y	
W-817-2318	EW	Tpsg-Tps	A	DIS-TF	E300.0:PERC	3		
W-817-2318	EW	Tpsg-Tps	S	CMP-TF	E624MOD:ALL	1	Y	
W-817-2318	EW	Tpsg-Tps	S	DIS-TF	E624MOD:ALL	2	Y	
W-817-2318	EW	Tpsg-Tps	S	CMP-TF	E624MOD:ALL	3		
W-817-2318	EW	Tpsg-Tps	S	DIS-TF	E624MOD:ALL	4		
W-817-2318	EW	Tpsg-Tps	A	CMP-TF	E8330LOW:ALL	1	Y	
W-817-2318	EW	Tpsg-Tps	A	DIS-TF	E8330LOW:ALL	3		
W-817-2609	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-817-2609	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-817-2609	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-817-2609	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-817-2609	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-817-3023	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-817-3025	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-817-3025	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-817-3025	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-817-3025	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-817-3025	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-817-3026	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-817-3026	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-817-3026	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-817-3026	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-817-3026	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-818-01	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	Inoperable equipment.
W-818-01	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	N	Inoperable equipment.
W-818-01	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	Inoperable equipment.
W-818-01	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-818-01	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	N	Inoperable equipment.
W-818-03	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-818-03	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-818-03	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-818-03	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-818-03	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-818-04	PTMW	Tnsc2	A	CMP	E300.0:NO3	1	Y	
W-818-04	PTMW	Tnsc2	A	CMP	E300.0:PERC	1	Y	
W-818-04	PTMW	Tnsc2	S	CMP	E624MOD:ALL	1	Y	
W-818-04	PTMW	Tnsc2	S	CMP	E624MOD:ALL	3		
W-818-04	PTMW	Tnsc2	A	CMP	E8330LOW:ALL	1	Y	
W-818-06	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-818-06	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-818-06	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-818-06	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-818-06	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-818-07	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-818-07	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-818-07	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-818-07	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-818-07	PTMW	Tnbs2	E	CMP	E8330LOW:ALL	1	Y	
W-818-08	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	N	Well location under construction.
W-818-08	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	N	Well location under construction.
W-818-08	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-818-08	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	N	Well location under construction.
W-818-08	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-818-08	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-818-08	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-818-08	EW	Tnbs2	A	CMP-TF	E8330LOW:ALL	1	N	Well location under construction.
W-818-09	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	N	Well location under construction.
W-818-09	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	N	Well location under construction.
W-818-09	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-818-09	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	N	Well location under construction.
W-818-09	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-818-09	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-818-09	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-818-09	EW	Tnbs2	A	CMP-TF	E8330LOW:ALL	1	N	Well location under construction.

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-818-11	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-818-11	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-818-11	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-818-11	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-818-11	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	Y	
W-819-02	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	Y	
W-819-02	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	Y	
W-819-02	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-819-02	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-819-02	PTMW	UTnbs1	A	CMP	E8330LOW:ALL	1	Y	
W-823-01	PTMW	Tpsg-Tps	A	CMP	E300.0:NO3	1	N	No access to well location.
W-823-01	PTMW	Tpsg-Tps	A	CMP	E300.0:PERC	1	N	No access to well location.
W-823-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-823-01	PTMW	Tpsg-Tps	S	CMP	E624MOD:ALL	3		
W-823-01	PTMW	Tpsg-Tps	A	CMP	E8330LOW:ALL	1	N	No access to well location.
W-823-02	PTMW	Tnbs2	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-823-02	PTMW	Tnbs2	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-823-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-823-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-823-02	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-823-03	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	No access to well location.
W-823-03	PTMW	Tnbs2	E	CMP	E300.0:PERC	1	N	No access to well location.
W-823-03	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-823-03	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-823-03	PTMW	Tnbs2	E	CMP	E8330LOW:ALL	1	N	No access to well location.
W-823-13	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	No access to well location.
W-823-13	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	N	No access to well location.
W-823-13	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-823-13	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-823-13	PTMW	Tnbs2	A	CMP	E8330LOW:ALL	1	N	No access to well location.
W-827-01	PTMW	Tnbs2	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-827-01	PTMW	Tnbs2	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-827-01	PTMW	Tnbs2	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
W-827-01	PTMW	Tnbs2	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-827-02	PTMW	Tnsc1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-827-02	PTMW	Tnsc1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-827-02	PTMW	Tnsc1	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
W-827-02	PTMW	Tnsc1	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-827-03	PTMW	UTnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-827-03	PTMW	UTnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-827-03	PTMW	UTnbs1	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
W-827-03	PTMW	UTnbs1	O	CMP	E8330LOW:ALL	1	N	To be sampled in 2017.
W-827-04	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	N	DRY.
W-827-04	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	N	DRY.
W-827-04	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	N	DRY.
W-827-04	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
W-827-04	PTMW	LTnbs1	A	CMP	E8330LOW:ALL	1	N	DRY.
W-827-05	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
W-827-05	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
W-827-05	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-827-05	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
W-827-05	PTMW	LTnbs1	A	CMP	E8330LOW:ALL	1	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:NO3	1	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:NO3	2	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:NO3	3		
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:NO3	4		
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:PERC	1	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:PERC	2	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:PERC	3		
W-829-06	EW	Tnsc1b	Q	DIS-TF	E300.0:PERC	4		
W-829-06	EW	Tnsc1b	Q	DIS-TF	E624MOD:ALL	1	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E624MOD:ALL	2	Y	
W-829-06	EW	Tnsc1b	Q	DIS-TF	E624MOD:ALL	3		
W-829-06	EW	Tnsc1b	Q	DIS-TF	E624MOD:ALL	4		
W-829-06	EW	Tnsc1b	A	DIS-TF	E8330LOW:ALL	1	Y	
W-829-08	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-829-08	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-829-08	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-829-08	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-829-08	PTMW	Tnsc1b	A	CMP	E8330LOW:ALL	1	Y	
W-829-15	DMW	LTnbs1	A	WGMG	E300.0:PERC	2	Y	
W-829-15	DMW	LTnbs1	A	WGMG	E624:ALL	2	Y	
W-829-15	DMW	LTnbs1	A	WGMG	E8330:R+H	2	Y	
W-829-15	DMW	LTnbs1	A	WGMG	E8330:TNT	2	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E300.0:PERC	1	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E300.0:PERC	2	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E300.0:PERC	3		
W-829-1938	DMW	LTnbs1	Q	WGMG	E300.0:PERC	4		
W-829-1938	DMW	LTnbs1	Q	WGMG	E624:ALL	1	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E624:ALL	2	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E624:ALL	3		
W-829-1938	DMW	LTnbs1	Q	WGMG	E624:ALL	4		
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:R+H	1	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:R+H	2	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:R+H	3		
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:R+H	4		
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:TNT	1	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:TNT	2	Y	
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:TNT	3		
W-829-1938	DMW	LTnbs1	Q	WGMG	E8330:TNT	4		
W-829-1940	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-829-1940	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-829-1940	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-829-1940	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-829-1940	PTMW	Tnsc1b	A	CMP	E8330LOW:ALL	1	Y	
W-829-22	DMW	LTnbs1	A	WGMG	E300.0:PERC	2	Y	
W-829-22	DMW	LTnbs1	A	WGMG	E624:ALL	2	Y	
W-829-22	DMW	LTnbs1	A	WGMG	E8330:R+H	2	Y	
W-829-22	DMW	LTnbs1	A	WGMG	E8330:TNT	2	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	1	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	1	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	1	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	2	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	2	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	3		
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	3		
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	4		
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	4		
WELL18	WS	Tnbs1	M	CMP	E300.0:NO3	4		
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	1	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	1	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	1	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	2	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	2	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	2	Y	
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	3		
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	3		
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	3		
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	4		
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	4		
WELL18	WS	Tnbs1	M	CMP	E300.0:PERC	4		
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	1	Y	
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	1	Y	
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	1	Y	
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	2	Y	
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	2	Y	
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	2	Y	
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	3		
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	3		
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	3		
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	4		
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	4		

Table 2.4-11. High Explosives Process Area Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
WELL18	WS	Tnbs1	M	CMP	E624MOD:ALL	4		
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	1	Y	
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	1	Y	
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	1	Y	
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	2	Y	
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	2	Y	
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	2	Y	
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	3		
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	3		
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	3		
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	4		
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	4		
WELL18	WS	Tnbs1	M	CMP	E8330LOW:ALL	4		
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	1	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	1	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	1	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	2	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	2	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	2	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	3		
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	3		
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	3		
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	4		
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	4		
WELL20	WS	Tnbs1	M	CMP	E300.0:NO3	4		
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	1	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	1	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	1	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	2	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	2	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	2	Y	
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	3		
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	3		
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	3		
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	4		
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	4		
WELL20	WS	Tnbs1	M	CMP	E300.0:PERC	4		
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	1	Y	
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	1	Y	
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	1	Y	
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	2	Y	
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	2	Y	
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	3		
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	3		
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	3		
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	4		
WELL20	WS	Tnbs1	M	WGMG	E524.2MOD:ALL	4		
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	1	Y	
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	1	Y	
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	1	Y	
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	2	Y	
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	2	Y	
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	2	Y	
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	3		
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	3		
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	3		
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	4		
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	4		
WELL20	WS	Tnbs1	M	CMP	E8330LOW:ALL	4		

Table 2.4-12. Building 815-Source (815-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS	GWTS	Perchlorate	Nitrate	RDX mass	TBOS/TKEBS
		VOC mass removed (g)	VOC mass removed (g)	mass removed (g)	mass removed (kg)	removed (g)	mass removed (g)
815-SRC	January	NA	0	0	0	0	NA
	February	NA	0.66	0.60	15	4.2	NA
	March	NA	0.80	0.71	19	5.2	NA
	April	NA	0.90	0.75	21	5.6	NA
	May	NA	1.0	0.86	24	6.5	NA
	June	NA	0.98	0.84	23	6.2	NA
Total		NA	4.4	3.8	100	28	NA

Notes:

*Nitrate re-injected into the Tnbs₂ HSU undergoes in-situ biotransformation to benign N₂ gas by anaerobic denitrifying bacteria.

Table 2.4-13. Building 815-Proximal (815-PRX) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS	GWTS	Perchlorate	Nitrate	RDX mass	TBOS/TKEBS
		VOC mass removed (g)	VOC mass removed (g)	mass removed (g)	mass removed (kg)	removed (g)	mass removed (g)
815-PRX	January	NA	0	0	0	0	NA
	February	NA	0	0	0	0	NA
	March	NA	0	0	0	0	NA
	April	NA	0	0	0	0	NA
	May	NA	2.4	1.1	11	0.28	NA
	June	NA	6.6	3.0	28	0.67	NA
Total		NA	9.0	4.1	38	0.95	NA

Notes:

*Nitrate re-injected into the Tnbs₂ HSU undergoes in-situ biotransformation to benign N₂ gas by anaerobic denitrifying bacteria.

Table 2.4-14. Building 815-Distal Site Boundary (815-DSB) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
815-DSB	January	NA	3.6	NA	NA	NA	NA
	February	NA	3.9	NA	NA	NA	NA
	March	NA	3.8	NA	NA	NA	NA
	April	NA	3.1	NA	NA	NA	NA
	May	NA	3.5	NA	NA	NA	NA
	June	NA	3.2	NA	NA	NA	NA
Total		NA	21	NA	NA	NA	NA

Table 2.4-15. Building 817-Source (817-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
817-SRC	January	NA	0	0	0	0	NA
	February	NA	0	0	0	0	NA
	March	NA	0	0	0	0	NA
	April	NA	0	0	0	0	NA
	May	NA	0	0.0056	0.015	0.0068	NA
	June	NA	0	0.030	0.11	0.057	NA
Total		NA	0	0.035	0.13	0.063	NA

Notes:

*Nitrate re-injected into the Tnbs₂ HSU undergoes in-situ biotransformation to benign N₂ gas by anaerobic denitrifying bacteria.

Table 2.4-16. Building 817-Proximal (817-PRX) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
817-PRX	January	NA	0	0	0	0	NA
	February	NA	1.3	3.4	14	1.7	NA
	March	NA	1.0	2.3	15	2.4	NA
	April	NA	1.2	2.8	18	2.9	NA
	May	NA	0.92	2.0	14	2.1	NA
	June	NA	1.2	2.7	17	2.8	NA
Total		NA	5.6	13	79	12	NA

Notes:

*Nitrate re-injected into the Tnbs₂ HSU undergoes in-situ biotransformation to benign N₂ gas by anaerobic denitrifying bacteria.

Table 2.4-17. Building 829-Source (829-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
829-SRC	January	NA	0	0	0	NA	NA
	February	NA	0.00020	< 0.0001	0.00048	NA	NA
	March	NA	0.018	0.0060	0.042	NA	NA
	April	NA	0.011	0.0058	0.039	NA	NA
	May	NA	0.013	0.0069	0.047	NA	NA
	June	NA	0.012	0.0063	0.043	NA	NA
Total		NA	0.054	0.025	0.17	NA	NA

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	1	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	2	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	3		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	4		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-01C	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	N	DRY.
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-01C	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	1	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	CMP	AS:UIISO	1	N	To be sampled in 2017.
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	2	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	3		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-02B	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-02B	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K1-02B	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	1	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	2	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	3		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	4		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-04	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-04	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-04	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	1	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	CMP	AS:UIISO	1	N	To be sampled in 2017.
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	2	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	3		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	4		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-05	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-06	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	N	DRY.
K1-06	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	N	DRY.
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	N	DRY.
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	N	DRY.
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	N	DRY.
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	N	DRY.
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-06	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-06	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	1	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	2	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	3		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-07	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K1-07	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-07	DMW	Tnbs1-Tnbs0	A	DIS	MS:UISO	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	1	Y	
K1-08	DMW	Tnbs1-Tnbs0	O	CMP	AS:UISO	1	N	To be sampled in 2017.
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	3		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	4		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-08	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K1-08	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	1	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	2	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	3		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UISO	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
K1-09	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K1-09	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
K2-03	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UISO	2	Y	
K2-03	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K2-03	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
K2-03	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K2-03	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K2-03	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K2-04S	PTMW	Qal/WBR	E	CMP	AS:UISO	2	Y	
K2-04S	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
K2-04S	PTMW	Qal/WBR	A	WGMG	E300.0:PERC	2	Y	
K2-04S	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
K2-04S	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
K2-04S	PTMW	Qal/WBR	S	CMP	E906:ALL	4		

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC2-05	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	N	DRY.
NC2-05	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	N	DRY.
NC2-05	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	N	DRY.
NC2-05	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-05	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	N	DRY.
NC2-05	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-05A	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-05A	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-05A	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-05A	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-05A	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-05A	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-06	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-06	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-06	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-06	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-06	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-06	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-06A	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-06A	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-06A	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-06A	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-06A	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-06A	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
NC2-09	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-09	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-09	PTMW	Tnbs1-Tnbs0	A	DIS	E300.0:PERC	2	Y	
NC2-09	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-09	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-10	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-10	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-10	PTMW	Tnbs1-Tnbs0	A	DIS	E300.0:PERC	2	Y	
NC2-10	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-10	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-11D	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-11D	PTMW	Tnbs1-Tnbs0	S	WGMG	E300.0:PERC	2	Y	
NC2-11D	PTMW	Tnbs1-Tnbs0	S	WGMG	E300.0:PERC	4		
NC2-11D	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-11D	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-11D	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-11D	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
NC2-11I	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-11I	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-11I	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-11I	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-11I	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-11I	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-11S	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-11S	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-11S	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-11S	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-11S	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-11S	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-12D	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-12D	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-12D	PTMW	Tnbs1-Tnbs0	A	WGMG	E300.0:PERC	2	Y	
NC2-12D	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-12D	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-12D	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-12I	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-12I	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-12I	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-12I	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-12I	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-12I	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-12S	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-12S	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-12S	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC2-12S	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-12S	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-12S	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-13	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-13	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-13	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-13	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-13	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-13	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-14S	PTMW	Qal/WBR	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC2-14S	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC2-14S	PTMW	Qal/WBR	S	CMP	E300.0:PERC	1	Y	
NC2-14S	PTMW	Qal/WBR	S	CMP	E300.0:PERC	3		
NC2-14S	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC2-14S	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC2-15	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-15	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-15	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-15	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-15	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-15	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-16	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
NC2-16	PTMW	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC2-16	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	1	Y	
NC2-16	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	3		
NC2-16	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-16	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-17	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-17	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-17	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-17	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-17	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-17	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-18	PTMW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	2	Y	
NC2-18	PTMW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	4		
NC2-18	PTMW	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC2-18	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-18	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-18	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-18	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-19	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
NC2-19	PTMW	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC2-19	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-19	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-19	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-19	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-20	PTMW	Tnbs1-Tnbs0	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC2-20	PTMW	Tnbs1-Tnbs0	E	CMP	E300.0:NO3	2	Y	
NC2-20	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC2-20	PTMW	Tnbs1-Tnbs0	A	CMP	E906:ALL	2	Y	
NC2-21	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
NC2-21	PTMW	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC2-21	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC2-21	PTMW	Tnbs1-Tnbs0	A	CMP	E906:ALL	2	Y	
NC7-10	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-10	PTMW	Qal/WBR	S	DIS	E300.0:PERC	1	Y	
NC7-10	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-10	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-10	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-10	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
NC7-11	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-11	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-11	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-11	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-11	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-11	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-11	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-14	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	Insufficient water.

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC7-14	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	Insufficient water.
NC7-14	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	N	Insufficient water.
NC7-14	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-14	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	Insufficient water.
NC7-14	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-15	PTMW	Qal/WBR	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC7-15	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
NC7-15	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-15	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-15	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-15	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-19	PTMW	Qal/WBR	E	CMP	AS:UIISO	2	Y	
NC7-19	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-19	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-19	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-19	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-19	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-19	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-27	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-27	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-27	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC7-27	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC7-27	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
NC7-27	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-27	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-28	PTMW	Tnbs1-Tnbs0	S	DIS	DWMETALS:ALL	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	Q	DIS	E300.0:PERC	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	Q	DIS	E300.0:PERC	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC7-28	PTMW	Tnbs1-Tnbs0	E	DIS	E8082A:ALL	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-28	PTMW	Tnbs1-Tnbs0	S	DIS	GENMIN:ALL	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	DIS	KPA:UTOT	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	DIS	LITEHCS:ALL	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	S	DIS	LOWVFAS:ALL	1	Y	
NC7-28	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
NC7-29	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-29	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-29	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC7-29	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC7-29	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-29	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-43	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-43	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-43	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC7-43	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC7-43	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
NC7-43	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-43	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-44	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-44	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-44	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC7-44	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC7-44	PTMW	Tnbs1-Tnbs0	E	DIS	E8082A:ALL	2	Y	
NC7-44	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
NC7-44	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-44	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-46	PTMW	Qal/WBR	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC7-46	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-46	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-46	PTMW	Qal/WBR	A	CMP	E906:ALL	2	Y	
NC7-54	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC7-54	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	N	DRY.
NC7-54	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-54	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
NC7-54	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-55	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	DRY.
NC7-55	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-55	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	N	DRY.
NC7-55	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-55	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
NC7-55	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-56	PTMW	Qal/WBR	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC7-56	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
NC7-56	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-56	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-56	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-56	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-56	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-57	PTMW	Qal/WBR	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC7-57	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	N	DRY.
NC7-57	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	N	DRY.
NC7-57	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-57	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
NC7-57	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-58	PTMW	Qal/WBR	E	CMP	AS:UIISO	2	Y	
NC7-58	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-58	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-58	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-58	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-58	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-59	PTMW	Qal/WBR	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
NC7-59	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
NC7-59	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-59	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-59	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-59	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-60	PTMW	Tnsc0	E	CMP	AS:UIISO	2	Y	
NC7-60	PTMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
NC7-60	PTMW	Tnsc0	S	CMP	E300.0:PERC	1	Y	
NC7-60	PTMW	Tnsc0	S	CMP	E300.0:PERC	3		
NC7-60	PTMW	Tnsc0	S	DIS	E8330LOW:ALL	2	Y	
NC7-60	PTMW	Tnsc0	S	CMP	E906:ALL	2	Y	
NC7-60	PTMW	Tnsc0	S	CMP	E906:ALL	4		
NC7-61	PTMW	Tnbs1-Tnbs0	S	DIS	DWMETALS:ALL	1	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
NC7-61	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
NC7-61	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	1	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	2	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	S	WGMG	E906:ALL	2	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-61	PTMW	Tnbs1-Tnbs0	S	WGMG	E906:ALL	4		
NC7-61	PTMW	Tnbs1-Tnbs0	S	DIS	GENMIN:ALL	1	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	S	DIS	KPA:UTOT	1	Y	
NC7-61	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
NC7-62	PTMW	Qal/WBR	E	CMP	AS:UIISO	2	Y	
NC7-62	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-62	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-62	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-62	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-62	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-69	PTMW	Tmss	A	CMP	AS:UIISO	2	N	Inoperable equipment.
NC7-69	PTMW	Tmss	A	CMP	E300.0:NO3	2	N	Inoperable equipment.
NC7-69	PTMW	Tmss	S	CMP	E300.0:PERC	2	N	Inoperable equipment.
NC7-69	PTMW	Tmss	S	CMP	E300.0:PERC	4		
NC7-69	PTMW	Tmss	S	CMP	E906:ALL	2	N	Inoperable equipment.

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC7-69	PTMW	Tmss	S	CMP	E906:ALL	4		
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	DWMETALS:ALL	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	E300.0:NO3	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	E300.0:PERC	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	2	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	GENMIN:ALL	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	KPA:UTOT	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	LITEHCS:ALL	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	S	DIS	LOWVFAS:ALL	1	Y	
NC7-70	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
NC7-71	PTMW	Qal/WBR	S	DIS	DWMETALS:ALL	1	Y	
NC7-71	PTMW	Qal/WBR	S	DIS	E300.0:NO3	1	Y	
NC7-71	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-71	PTMW	Qal/WBR	Q	DIS	E300.0:PERC	1	Y	
NC7-71	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-71	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-71	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-71	PTMW	Qal/WBR	Q	DIS	E9060:ALL	1	Y	
NC7-71	PTMW	Qal/WBR	Q	DIS	E9060:ALL	2	Y	
NC7-71	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-71	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-71	PTMW	Qal/WBR	S	DIS	GENMIN:ALL	1	Y	
NC7-71	PTMW	Qal/WBR	S	DIS	KPA:UTOT	1	Y	
NC7-71	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
NC7-72	PTMW	Qal/WBR	E	CMP	AS:UIISO	2	Y	
NC7-72	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-72	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-72	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-72	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-72	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-72	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-73	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-73	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
NC7-73	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
NC7-73	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
NC7-73	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
NC7-73	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-73	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
SPRING24	SPR	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	N	DRY.
SPRING24	SPR	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
SPRING24	SPR	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	N	DRY.
SPRING24	SPR	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
SPRING24	SPR	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	N	DRY.
SPRING24	SPR	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-05	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
W-850-05	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-850-05	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
W-850-05	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
W-850-05	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
W-850-05	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-850-05	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-850-2145	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
W-850-2145	PTMW	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
W-850-2145	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2145	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-850-2145	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2145	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-2312	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
W-850-2312	PTMW	Tnbs1-Tnbs0	E	CMP	E300.0:NO3	2	Y	
W-850-2312	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2312	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-850-2312	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2312	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-2313	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
W-850-2313	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
W-850-2313	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
W-850-2313	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
W-850-2313	PTMW	Qal/WBR	S	DIS	E8330LOW:ALL	2	Y	
W-850-2313	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-850-2313	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-850-2313	PTMW	Qal/WBR	A	DIS	MS:UIISO	2	Y	
W-850-2314	PTMW	Tnbs1-Tnbs0	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
W-850-2314	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-850-2314	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2314	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-850-2314	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
W-850-2314	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2314	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-2315	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
W-850-2315	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-850-2315	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2315	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-850-2315	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2315	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-2316	PTMW	Tnbs1-Tnbs0	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
W-850-2316	PTMW	Tnbs1-Tnbs0	E	CMP	E300.0:NO3	2	Y	
W-850-2316	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2316	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-850-2316	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2316	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-2416	PTMW	Tnsc0	S	DIS	DWMETALS:ALL	1	Y	
W-850-2416	PTMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-850-2416	PTMW	Tnsc0	S	DIS	E300.0:PERC	1	Y	
W-850-2416	PTMW	Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-850-2416	PTMW	Tnsc0	S	CMP	E300.0:PERC	4		
W-850-2416	PTMW	Tnsc0	S	DIS	E8330LOW:ALL	2	Y	
W-850-2416	PTMW	Tnsc0	Q	DIS	E9060:ALL	1	Y	
W-850-2416	PTMW	Tnsc0	Q	DIS	E9060:ALL	2	Y	
W-850-2416	PTMW	Tnsc0	S	CMP	E906:ALL	2	Y	
W-850-2416	PTMW	Tnsc0	S	CMP	E906:ALL	4		
W-850-2416	PTMW	Tnsc0	S	DIS	GENMIN:ALL	1	Y	
W-850-2416	PTMW	Tnsc0	S	DIS	KPA:UTOT	1	Y	
W-850-2416	PTMW	Tnsc0	A	CMP	MS:UIISO	2	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	DWMETALS:ALL	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	E300.0:NO3	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	Q	DIS	E300.0:PERC	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	E8330LOW:ALL	2	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	Q	DIS	E9060:ALL	2	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	GENMIN:ALL	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	KPA:UTOT	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	LITEHCS:ALL	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	LOWVFAS:ALL	1	Y	
W-850-2417	PTMW	Tnbs1-Tnbs0	S	DIS	MS:UIISO	1	Y	
W-850-2805	PTMW	Tnbs1/Tnbs0	A	CMP	AS:UIISO	2	Y	
W-850-2805	PTMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-850-2805	PTMW	Tnbs1/Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-850-2805	PTMW	Tnbs1/Tnbs0	S	CMP	E300.0:PERC	4		
W-850-2805	PTMW	Tnbs1/Tnbs0	S	CMP	E906:ALL	2	Y	
W-850-2805	PTMW	Tnbs1/Tnbs0	S	CMP	E906:ALL	4		
W-865-02	PTMW	Tnbs1-Tnbs0	A	DIS	DWMETALS:ALL	1	Y	
W-865-02	PTMW	Tnbs1-Tnbs0	S	DIS	E300.0:NO3	1	Y	
W-865-02	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	1	Y	
W-865-02	PTMW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	1	Y	

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-865-02	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	1	Y	
W-865-02	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	3		
W-865-05	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	1	N	Insufficient water. Partial sampling.
W-865-05	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	1	N	Insufficient water. Partial sampling.
W-865-05	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	3		
W-865-1802	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
W-865-1802	PTMW	Tnbs1-Tnbs0	A	DIS	E300.0:NO3	2	Y	
W-865-1802	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
W-865-1802	PTMW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	1	Y	
W-865-1802	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-865-1802	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-865-1803	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
W-865-1803	PTMW	Tnbs1-Tnbs0	E	CMP	E300.0:NO3	2	Y	
W-865-1803	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-865-1803	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-865-1803	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-865-1803	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-865-2005	PTMW	Tnbs1-Tnbs0	A	DIS	DWMETALS:ALL	1	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	S	DIS	E300.0:NO3	1	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
W-865-2005	PTMW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	1	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
W-865-2005	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
W-865-2121	PTMW	Tnbs1-Tnbs0	A	DIS	DWMETALS:ALL	1	Y	
W-865-2121	PTMW	Tnbs1-Tnbs0	S	DIS	E300.0:NO3	1	Y	
W-865-2121	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	1	Y	
W-865-2121	PTMW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	1	Y	
W-865-2121	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-865-2121	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-865-2133	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	1	Y	
W-865-2133	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	3		
W-865-2133	GW	Tnbs1-Tnbs0	A	DIS	DWMETALS:ALL	1	Y	
W-865-2133	GW	Tnbs1-Tnbs0	S	DIS	E300.0:NO3	1	Y	
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	1	Y	
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	2	Y	
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	3		
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	4		
W-865-2133	GW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	1	Y	
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	1	Y	
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	2	Y	
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	3		
W-865-2133	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	4		
W-865-2224	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	2	Y	
W-865-2224	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	4		
W-865-2224	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	2	Y	
W-865-2224	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	4		
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	1	Y	
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	2	Y	
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	3		
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	4		
W-865-2224	GW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	2	Y	
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	1	Y	
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	2	Y	
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	3		
W-865-2224	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	4		
W-PIT1-01	PTMW	Tnbs1-Tnbs0	O	CMP	AS:UIISO	1	N	To be sampled in 2017.
W-PIT1-01	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	1	N	DRY.
W-PIT1-01	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	3		
W-PIT1-01	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	1	N	DRY.
W-PIT1-01	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	3		
W-PIT1-2204	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	Insufficient water. Partial sampling.
W-PIT1-2204	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	Insufficient water. Partial sampling.
W-PIT1-2204	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	N	Insufficient water. Partial sampling.

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-PIT1-2204	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
W-PIT1-2204	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	Insufficient water. Partial sampling.
W-PIT1-2204	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT1-2209	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	2	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	4		
W-PIT1-2209	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	2	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	4		
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	4		
W-PIT1-2209	GW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	2	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	4		
W-PIT1-2209	GW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
W-PIT1-2225	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	2	Y	
W-PIT1-2225	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	4		
W-PIT1-2225	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	2	Y	
W-PIT1-2225	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	4		
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	1	Y	
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	2	Y	
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	3		
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	4		
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	1	Y	
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	2	Y	
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	3		
W-PIT1-2225	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	4		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	1	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	2	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	3		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	AS:UIISO	4		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	1	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	2	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	3		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:NO3	4		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	1	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	2	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	3		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8260:ALL	4		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	1	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	2	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	3		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E8330:R+H	4		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
W-PIT1-2326	DMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	E	CMP	AS:UIISO	2	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	A	DIS	DWMETALS:ALL	2	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	A	DIS	E300.0:NO3	2	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	1	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	2	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	3		
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E300.0:PERC	4		
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	2	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	1	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	2	Y	
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	3		
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	Q	WGMG	E906:ALL	4		
W-PIT1-2620	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		

Table 2.5-1. Building 850 Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	A	CMP	AS:UIISO	2	Y	
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	A	CMP	E624MOD:ALL	2	Y	
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT1-3021	PTMW	Tnbs1/Tnbs0	S	CMP	E906:ALL	4		
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	A	CMP	AS:UIISO	2	Y	
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	A	CMP	E624MOD:ALL	2	Y	
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT1-3022	PTMW	Tnbs1/Tnbs0	S	CMP	E906:ALL	4		
W-PIT7-16	PTMW	Tnsc0	A	CMP	AS:UIISO	2	Y	
W-PIT7-16	PTMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-PIT7-16	PTMW	Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-PIT7-16	PTMW	Tnsc0	S	CMP	E300.0:PERC	4		
W-PIT7-16	PTMW	Tnsc0	S	DIS	E8330LOW:ALL	2	Y	
W-PIT7-16	PTMW	Tnsc0	S	CMP	E906:ALL	2	Y	
W-PIT7-16	PTMW	Tnsc0	S	CMP	E906:ALL	4		
W8SPRNG	SPR	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	N	DRY.
W8SPRNG	SPR	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	N	DRY.
W8SPRNG	SPR	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	N	DRY.
W8SPRNG	SPR	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W8SPRNG	SPR	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	N	DRY.
W8SPRNG	SPR	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		

Table 2.5-2. Pit 7-Source (PIT7-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
PIT7-SRC	January	NA	713	NA	1,701
	February	NA	770	NA	2,718
	March	NA	740	NA	2,952
	April	NA	672	NA	3,573
	May	NA	792	NA	3,137
	June	NA	720	NA	2,969
Total		NA	4,407	NA	17,050

Table 2.5-3. Pit 7-Source (PIT7-SRC) volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2- DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
PIT7-SRC-I	1/11/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-I	4/5/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-E	1/11/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-E	2/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-E	3/1/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-E	4/5/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-E	5/3/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PIT7-SRC-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.5-3 (Con't). Analyte detected but not reported in main table.

Location	Date	Detection frequency
PIT7-SRC-I	1/11/16	0 of 18
PIT7-SRC-I	4/5/16	0 of 18
PIT7-SRC-E	1/11/16	0 of 18
PIT7-SRC-E	2/3/16	0 of 18
PIT7-SRC-E	3/1/16	0 of 18
PIT7-SRC-E	4/5/16	0 of 18
PIT7-SRC-E	5/3/16	0 of 18
PIT7-SRC-E	6/6/16	0 of 18

Notes:

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.5-4. Pit 7-Source (PIT7-SRC) nitrate and perchlorate in ground water extraction and treatment system influent and effluent.

Location	Date	Nitrate as NO₃ (mg/L)	Perchlorate (µg/L)
PIT7-SRC-I	1/11/16	40	10
PIT7-SRC-I	4/5/16	45	9.5
PIT7-SRC-E	1/11/16	<0.5	<4
PIT7-SRC-E	2/3/16	<0.5	<4
PIT7-SRC-E	3/1/16	<0.5	<4
PIT7-SRC-E	4/5/16	<0.5	<4
PIT7-SRC-E	5/3/16	9.5	<4
PIT7-SRC-E	6/6/16	17	<4

Notes:

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.5-5. Pit 7-Source (PIT7-SRC) total uranium in ground water extraction and treatment system influent and effluent.

Location	Date	Uranium 234 and 233 (in activity) (pCi/L)	Uranium 235 and 236 (in activity) (pCi/L)	Uranium 238 (in activity) (pCi/L)	Total Uranium Calculated (in activity) (pCi/L)
PIT7-SRC-I	1/11/16	9.93 ± 0.984 J	0.658 ± 0.115 J	12.2 ± 1.20 J	22.8 ± 1.56 J
PIT7-SRC-I	4/5/16	11.0 ± 1.11	0.669 ± 0.121	13.8 ± 1.38	25.5 ± 1.78
PIT7-SRC-E	1/11/16	<0.1	<0.1	<0.1	<0.3
PIT7-SRC-E	2/3/16	<0.1	<0.1	<0.1	<0.3
PIT7-SRC-E	3/1/16	<0.1	<0.1	<0.1	<0.3
PIT7-SRC-E	4/5/16	<0.1	<0.1	<0.1	<0.3
PIT7-SRC-E	5/3/16	<0.1	0.109 ± 0.105	<0.1 O	0.309 ± 0.150
PIT7-SRC-E	6/6/16	<0.1	<0.1	<0.1	<0.3

Notes:

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.5-6. Pit 7-Source (PIT7-SRC) tritium in ground water extraction and treatment system influent and effluent.

Location	Date	Tritium (pCi/L)
PIT7-SRC-I	1/11/16	38000 ± 7390
PIT7-SRC-I	4/5/16	37500 ± 7280
PIT7-SRC-E	1/11/16	38500 ± 7480
PIT7-SRC-E	2/3/16	37400 ± 7270
PIT7-SRC-E	3/1/16	38200 ± 7420
PIT7-SRC-E	4/5/16	37600 ± 7300
PIT7-SRC-E	5/3/16	34600 ± 6730
PIT7-SRC-E	6/6/16	37000 ± 7190

Notes:

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.5-7. Pit 7-Source (PIT7-SRC) treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
<i>PIT7-SRC GWTS</i>			
Influent Port	PIT7-SRC-I	VOCs	Quarterly
		Uranium	Quarterly
		Perchlorate	Quarterly
		Nitrate	Quarterly
		Tritium^a	Quarterly
		pH	Quarterly
Effluent Port	PIT7-SRC-E	VOCs	Monthly
		Uranium	Monthly
		Perchlorate	Monthly
		Nitrate	Monthly
		Tritium^a	Monthly
		pH	Monthly

Notes:

^a Although tritium is not treated/removed by the PIT7-SRC GWTS, tritium activities will be monitoring to determine levels that are being discharged to the infiltration trench.

One duplicate and one blank (given fictitious labels) shall be taken for every 12 samples.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	E8082A:ALL	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
K7-01	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	E8082A:ALL	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
K7-03	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	E8082A:ALL	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K7-06	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K7-06	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K7-07	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	DRY.
K7-07	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	N	DRY.
K7-07	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
K7-07	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	N	DRY.
K7-07	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
K7-07	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
K7-09	DMW	Tnsc0	A	CMP	ANIONS:FL	2	Y	
K7-09	DMW	Tnsc0	A	CMP	AS:UIISO	2	Y	
K7-09	DMW	Tnsc0	A	CMP	E200.7:LI	2	Y	
K7-09	DMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
K7-09	DMW	Tnsc0	S	CMP	E300.0:PERC	2	Y	
K7-09	DMW	Tnsc0	S	CMP	E300.0:PERC	4		
K7-09	DMW	Tnsc0	A	CMP	E624MOD:ALL	2	Y	
K7-09	DMW	Tnsc0	A	CMP	E8082A:ALL	2	Y	
K7-09	DMW	Tnsc0	A	CMP	E8330LOW:ALL	2	Y	
K7-09	DMW	Tnsc0	S	CMP	E906:ALL	2	Y	
K7-09	DMW	Tnsc0	S	CMP	E906:ALL	4		
K7-09	DMW	Tnsc0	A	CMP	T26METALS:ALL	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	E8082A:ALL	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K7-10	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K7-10	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
NC7-12	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-12	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
NC7-12	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-12	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-12	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC7-12	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-12	PTMW	Qal/WBR	A	DIS	MS:UIISO	2	Y	
NC7-16	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-16	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-16	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-16	PTMW	Qal/WBR	S	DIS	E906:ALL	1	Y	
NC7-16	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-16	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-16	PTMW	Qal/WBR	Q	DIS	MS:UIISO	1	Y	
NC7-16	PTMW	Qal/WBR	Q	DIS	MS:UIISO	2	Y	
NC7-17	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-17	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-17	PTMW	Qal/WBR	E	CMP	E300.0:PERC	2	Y	
NC7-17	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-17	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-17	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-17	PTMW	Qal/WBR	A	DIS	GENMIN:ALL	2	Y	
NC7-18	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-18	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-18	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-18	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-18	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-18	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-20	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-20	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-20	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-20	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-20	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-20	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-21	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-21	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-21	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-21	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-21	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-21	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-22	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	DRY.
NC7-22	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
NC7-22	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
NC7-22	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	N	DRY.
NC7-22	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
NC7-22	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-24	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	DRY.
NC7-24	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
NC7-24	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
NC7-24	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
NC7-24	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-25	EW	Tnbs1-Tnbs0	A	CMP-TF	AS:UIISO	2	Y	
NC7-25	EW	Tnbs1-Tnbs0	A	CMP-TF	E300.0:NO3	2	Y	
NC7-25	EW	Tnbs1-Tnbs0	A	CMP-TF	E300.0:PERC	2	Y	
NC7-25	EW	Tnbs1-Tnbs0	A	DIS-TF	E300.0:PERC	4		
NC7-25	EW	Tnbs1-Tnbs0	A	CMP-TF	E624MOD:ALL	2	Y	
NC7-25	EW	Tnbs1-Tnbs0	A	DIS-TF	E624MOD:ALL	4		
NC7-25	EW	Tnbs1-Tnbs0	S	CMP-TF	E906:ALL	2	Y	
NC7-25	EW	Tnbs1-Tnbs0	S	CMP-TF	E906:ALL	4		
NC7-25	EW	Tnbs1-Tnbs0	S	DIS-TF	KPA:UTOT	2	Y	
NC7-25	EW	Tnbs1-Tnbs0	S	DIS-TF	KPA:UTOT	4		
NC7-25	EW	Tnbs1-Tnbs0	A	DIS-TF	MS:UIISO	4		
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	E8082A:ALL	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
NC7-26	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC7-34	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-34	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-34	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-34	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-34	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-34	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-36	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-36	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-36	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC7-36	PTMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
NC7-36	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-36	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-37	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	N	DRY.
NC7-37	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
NC7-37	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
NC7-37	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	N	DRY.
NC7-37	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
NC7-37	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-40	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-40	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-40	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-40	PTMW	Qal/WBR	S	DIS	E906:ALL	1	Y	
NC7-40	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-40	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-40	PTMW	Qal/WBR	Q	DIS	MS:UIISO	1	Y	
NC7-40	PTMW	Qal/WBR	Q	DIS	MS:UIISO	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E8082A:ALL	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	E906:ALL	2	Y	
NC7-47	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	ANIONS:FL	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	E200.7:LI	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	E8082A:ALL	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	E8330LOW:ALL	2	Y	
NC7-48	DMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-48	DMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-48	DMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
NC7-48	DMW	Qal/WBR	A	CMP	T26METALS:ALL	2	Y	
NC7-49A	PTMW	Qal/WBR	A	CMP	AS:UIISO	2	Y	
NC7-49A	PTMW	Qal/WBR	E	CMP	E300.0:NO3	2	Y	
NC7-49A	PTMW	Qal/WBR	E	CMP	E300.0:PERC	2	Y	
NC7-49A	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-49A	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-50	CW	Tmss	E	DIS	AS:UIISO	2	Y	
NC7-51	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-51	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-51	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-51	PTMW	Qal/WBR	S	DIS	E906:ALL	1	Y	
NC7-51	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-51	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-51	PTMW	Qal/WBR	Q	DIS	MS:UIISO	1	Y	
NC7-51	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
NC7-51	PTMW	Qal/WBR	Q	UK	MS:UIISO	3		
NC7-52	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC7-52	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-52	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC7-52	PTMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
NC7-52	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	1	Y	
NC7-52	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	3		

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
NC7-53	PTMW	Qal/WBR	A	DIS	AS:UIO	2	Y	
NC7-53	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-53	PTMW	Qal/WBR	O	CMP	E300.0:PERC	2	N	To be sampled in 2017.
NC7-63	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
NC7-63	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-63	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
NC7-63	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-63	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
NC7-63	PTMW	Qal/WBR	A	CMP	MS:UIO	2	Y	
NC7-64	EW	Qal/WBR	A	CMP-TF	AS:UIO	2	Y	
NC7-64	EW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	Y	
NC7-64	EW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	Y	
NC7-64	EW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
NC7-64	EW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	Y	
NC7-64	EW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
NC7-64	EW	Qal/WBR	S	CMP-TF	E906:ALL	2	Y	
NC7-64	EW	Qal/WBR	S	CMP-TF	E906:ALL	4		
NC7-64	EW	Qal/WBR	S	DIS-TF	KPA:UTOT	2	Y	
NC7-64	EW	Qal/WBR	S	DIS-TF	KPA:UTOT	4		
NC7-64	EW	Qal/WBR	A	DIS-TF	MS:UIO	4		
NC7-65	PTMW	Tnsc0	A	CMP	AS:UIO	2	Y	
NC7-65	PTMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
NC7-65	PTMW	Tnsc0	A	CMP	E300.0:PERC	2	Y	
NC7-65	PTMW	Tnsc0	A	CMP	E624MOD:ALL	2	Y	
NC7-65	PTMW	Tnsc0	S	CMP	E906:ALL	2	Y	
NC7-65	PTMW	Tnsc0	S	CMP	E906:ALL	4		
NC7-65	PTMW	Tnsc0	A	DIS	MS:UIO	2	Y	
NC7-67	PTMW	Tnsc0	A	CMP	AS:UIO	2	Y	
NC7-67	PTMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
NC7-67	PTMW	Tnsc0	A	CMP	E300.0:PERC	2	Y	
NC7-67	PTMW	Tnsc0	A	CMP	E624MOD:ALL	2	Y	
NC7-67	PTMW	Tnsc0	S	CMP	E906:ALL	2	Y	
NC7-67	PTMW	Tnsc0	S	CMP	E906:ALL	4		
NC7-68	PTMW	Tnbs1-Tnbs0	A	DIS	AS:UIO	2	Y	
NC7-68	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC7-68	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
NC7-68	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC7-68	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC7-75	PTMW	Tnsc0	A	CMP	AS:UIO	2	Y	
NC7-75	PTMW	Tnsc0	A	CMP	E300.0:NO3	2	Y	
NC7-75	PTMW	Tnsc0	S	CMP	E300.0:PERC	2	Y	
NC7-75	PTMW	Tnsc0	S	CMP	E300.0:PERC	4		
NC7-75	PTMW	Tnsc0	A	CMP	E624MOD:ALL	2	Y	
NC7-75	PTMW	Tnsc0	S	CMP	E906:ALL	2	Y	
NC7-75	PTMW	Tnsc0	S	CMP	E906:ALL	4		
NC7-76	PTMW	Qal/WBR	A	CMP	AS:UIO	2	Y	
NC7-76	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
NC7-76	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
NC7-76	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
NC7-76	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-865-01	PTMW	Tnbs1-Tnbs0	A	DIS	DWMETALS:ALL	1	Y	
W-865-01	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	1	Y	
W-865-01	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	1	Y	
W-865-01	PTMW	Tnbs1-Tnbs0	S	DIS	E624MOD:ALL	1	Y	
W-865-01	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	1	Y	
W-865-01	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	3		
W-865-03	PTMW	Tnbs1-Tnbs0	A	DIS	E300.0:NO3	1	Y	
W-865-03	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	1	Y	
W-865-03	PTMW	Tnbs1-Tnbs0	A	DIS	E906:ALL	1	Y	
W-865-1804	PTMW	Tnbs1-Tnbs0	E	CMP	E300.0:NO3	1	N	No access to well location.
W-865-1804	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	1	N	No access to well location.
W-865-1804	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	1	N	No access to well location.
W-865-1804	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	3		
W-PIT3-01	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT3-01	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
W-PIT3-01	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
W-PIT3-01	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT3-01	PTMW	Qal/WBR	A	CMP	MS:UIO	2	N	DRY.

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-PIT3-02	PTMW	Qal/WBR	A	CMP	AS:UIO	2	N	DRY.
W-PIT3-02	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT3-02	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
W-PIT3-02	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
W-PIT3-02	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT5-01	PTMW	Qal/WBR	A	CMP	AS:UIO	2	N	DRY.
W-PIT5-01	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT5-01	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
W-PIT5-01	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
W-PIT5-01	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT5-02	PTMW	Qal/WBR	A	CMP	AS:UIO	2	N	DRY.
W-PIT5-02	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT5-02	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	DRY.
W-PIT5-02	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
W-PIT5-02	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT7-02	PTMW	Qal/WBR	A	CMP	AS:UIO	2	Y	
W-PIT7-02	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT7-02	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
W-PIT7-02	PTMW	Qal/WBR	S	CMP	E906:ALL	1	Y	
W-PIT7-02	PTMW	Qal/WBR	S	CMP	E906:ALL	3		
W-PIT7-03	PTMW	Qal/WBR	A	CMP	AS:UIO	2	Y	
W-PIT7-03	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT7-03	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
W-PIT7-03	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	2	Y	
W-PIT7-03	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	4		
W-PIT7-03	PTMW	Qal/WBR	A	CMP	E906:ALL	1	Y	
W-PIT7-10	PTMW	Qal/WBR	A	CMP	AS:UIO	2	Y	
W-PIT7-10	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT7-10	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
W-PIT7-10	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
W-PIT7-10	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-PIT7-10	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT7-11	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIO	2	N	DRY.
W-PIT7-11	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT7-11	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	N	DRY.
W-PIT7-11	PTMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	N	DRY.
W-PIT7-11	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	N	DRY.
W-PIT7-11	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT7-12	PTMW	Tnbs1-Tnbs0	O	CMP	AS:UIO	2	N	To be sampled in 2017.
W-PIT7-12	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT7-12	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
W-PIT7-12	PTMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
W-PIT7-12	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT7-12	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT7-13	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIO	2	Y	
W-PIT7-13	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT7-13	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
W-PIT7-13	PTMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
W-PIT7-13	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT7-13	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT7-14	PTMW	Tnsc0	A	CMP	E300.0:PERC	2	Y	
W-PIT7-14	PTMW	Tnsc0	A	CMP	E906:ALL	2	Y	
W-PIT7-14	PTMW	Tnsc0	A	DIS	MS:UIO	2	Y	
W-PIT7-15	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT7-15	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:PERC	2	Y	
W-PIT7-15	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT7-15	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT7-15	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIO	2	Y	
W-PIT7-1860	PTMW	Tnbs1-Tnbs0	E	DIS	AS:UIO	2	Y	
W-PIT7-1860	PTMW	Tnbs1-Tnbs0	E	CMP	E300.0:PERC	2	Y	
W-PIT7-1860	PTMW	Tnbs1-Tnbs0	E	CMP	E906:ALL	2	Y	
W-PIT7-1861	PTMW	Qal/WBR	O	CMP	AS:UIO	2	N	To be sampled in 2017.
W-PIT7-1861	PTMW	Qal/WBR	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
W-PIT7-1861	PTMW	Qal/WBR	O	CMP	E300.0:PERC	2	N	To be sampled in 2017.
W-PIT7-1861	PTMW	Qal/WBR	O	CMP	E906:ALL	2	N	To be sampled in 2017.
W-PIT7-1903	PTMW	Qal/WBR	A	DIS	AS:UIO	2	Y	
W-PIT7-1903	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1904	PTMW	Qal/WBR	A	DIS	AS:UIO	2	Y	

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-PIT7-1904	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1905	PTMW	Qal/WBR	A	DIS	AS:UIISO	2	Y	
W-PIT7-1905	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1907	PTMW	Qal/WBR	A	DIS	AS:UIISO	2	Y	
W-PIT7-1907	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1915	PTMW	Qal/WBR	A	DIS	AS:UIISO	2	Y	
W-PIT7-1915	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1916	PTMW	Qal/WBR	A	DIS	AS:UIISO	2	Y	
W-PIT7-1916	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1917	PTMW	Qal/WBR	A	DIS	AS:UIISO	2	Y	
W-PIT7-1917	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1918	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT7-1918	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-1918	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
W-PIT7-1918	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
W-PIT7-1918	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-PIT7-1918	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT7-1918	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
W-PIT7-1919	PTMW	Qal/WBR	A	DIS	AS:UIISO	2	Y	
W-PIT7-1919	PTMW	Qal/WBR	A	DIS	E300.0:O-PO2	2	Y	
W-PIT7-2141	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT7-2141	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-PIT7-2141	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT7-2141	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT7-2141	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT7-2141	PTMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
W-PIT7-2305	EW	Qal/WBR	A	CMP-TF	AS:UIISO	2	Y	
W-PIT7-2305	EW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	Y	
W-PIT7-2305	EW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	Y	
W-PIT7-2305	EW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
W-PIT7-2305	EW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	Y	
W-PIT7-2305	EW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
W-PIT7-2305	EW	Qal/WBR	S	CMP-TF	E906:ALL	2	Y	
W-PIT7-2305	EW	Qal/WBR	S	CMP-TF	E906:ALL	4		
W-PIT7-2305	EW	Qal/WBR	S	DIS-TF	KPA:UTOT	2	Y	
W-PIT7-2305	EW	Qal/WBR	S	DIS-TF	KPA:UTOT	4		
W-PIT7-2305	EW	Qal/WBR	A	DIS-TF	MS:UIISO	4		
W-PIT7-2306	EW	Qal/WBR	A	CMP-TF	AS:UIISO	2	N	Insufficient water.
W-PIT7-2306	EW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	N	Insufficient water.
W-PIT7-2306	EW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	N	Insufficient water.
W-PIT7-2306	EW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
W-PIT7-2306	EW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	N	Insufficient water.
W-PIT7-2306	EW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
W-PIT7-2306	EW	Qal/WBR	S	CMP-TF	E906:ALL	2	N	Insufficient water.
W-PIT7-2306	EW	Qal/WBR	S	CMP-TF	E906:ALL	4		
W-PIT7-2306	EW	Qal/WBR	A	DIS-TF	KPA:UTOT	3		
W-PIT7-2306	EW	Qal/WBR	A	DIS-TF	MS:UIISO	4		
W-PIT7-2307	EW	Qal/WBR	A	CMP-TF	AS:UIISO	2	Y	
W-PIT7-2307	EW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	Y	
W-PIT7-2307	EW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	Y	
W-PIT7-2307	EW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
W-PIT7-2307	EW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	Y	
W-PIT7-2307	EW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
W-PIT7-2307	EW	Qal/WBR	S	CMP-TF	E906:ALL	2	Y	
W-PIT7-2307	EW	Qal/WBR	S	CMP-TF	E906:ALL	4		
W-PIT7-2307	EW	Qal/WBR	A	DIS-TF	KPA:UTOT	3		
W-PIT7-2307	EW	Qal/WBR	A	DIS-TF	MS:UIISO	4		
W-PIT7-2309	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT7-2309	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	Y	
W-PIT7-2309	PTMW	Qal/WBR	A	CMP	E624MOD:ALL	2	Y	
W-PIT7-2309	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-PIT7-2309	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT7-2309	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
W-PIT7-2703	PTMW	Qal/WBR	A	CMP-TF	AS:UIISO	2	Y	
W-PIT7-2703	PTMW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	Y	
W-PIT7-2703	PTMW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	Y	
W-PIT7-2703	PTMW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
W-PIT7-2703	PTMW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	Y	

Table 2.5-8. Pit 7 Complex Area of Operable Unit 5 ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-PIT7-2703	PTMW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
W-PIT7-2703	PTMW	Qal/WBR	S	CMP-TF	E906:ALL	2	Y	
W-PIT7-2703	PTMW	Qal/WBR	S	CMP-TF	E906:ALL	4		
W-PIT7-2703	PTMW	Qal/WBR	S	CMP-TF	KPA:UTOT	2	Y	
W-PIT7-2703	PTMW	Qal/WBR	S	CMP-TF	KPA:UTOT	4		
W-PIT7-2703	PTMW	Qal/WBR	A	DIS-TF	MS:UISO	4		
W-PIT7-2704	PTMW	Qal/WBR	A	CMP-TF	AS:UISO	2	N	Insufficient water.
W-PIT7-2704	PTMW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	N	Insufficient water.
W-PIT7-2704	PTMW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	N	Insufficient water.
W-PIT7-2704	PTMW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
W-PIT7-2704	PTMW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	N	Insufficient water.
W-PIT7-2704	PTMW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
W-PIT7-2704	PTMW	Qal/WBR	S	CMP-TF	E906:ALL	2	N	Insufficient water.
W-PIT7-2704	PTMW	Qal/WBR	S	CMP-TF	E906:ALL	4		
W-PIT7-2704	PTMW	Qal/WBR	A	CMP-TF	KPA:UTOT	3		
W-PIT7-2704	PTMW	Qal/WBR	A	DIS-TF	MS:UISO	4		
W-PIT7-2705	PTMW	Qal/WBR	A	CMP-TF	AS:UISO	2	Y	
W-PIT7-2705	PTMW	Qal/WBR	A	CMP-TF	E300.0:NO3	2	Y	
W-PIT7-2705	PTMW	Qal/WBR	A	CMP-TF	E300.0:PERC	2	Y	
W-PIT7-2705	PTMW	Qal/WBR	A	DIS-TF	E300.0:PERC	4		
W-PIT7-2705	PTMW	Qal/WBR	A	CMP-TF	E624MOD:ALL	2	Y	
W-PIT7-2705	PTMW	Qal/WBR	A	DIS-TF	E624MOD:ALL	4		
W-PIT7-2705	PTMW	Qal/WBR	S	CMP-TF	E906:ALL	2	Y	
W-PIT7-2705	PTMW	Qal/WBR	S	CMP-TF	E906:ALL	4		
W-PIT7-2705	PTMW	Qal/WBR	S	CMP-TF	KPA:UTOT	2	Y	
W-PIT7-2705	PTMW	Qal/WBR	S	CMP-TF	KPA:UTOT	4		
W-PIT7-2705	PTMW	Qal/WBR	A	DIS-TF	MS:UISO	4		

Table 2.5-9. PIT7-Source (PIT7-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	Total Uranium mass removed (g)
PIT7-SRC	January	NA	< 0.0001	0.070	0.26	0.22
	February	NA	0	0.11	0.42	0.35
	March	NA	< 0.0001	0.12	0.45	0.40
	April	NA	0.00082	0.13	0.62	0.33
	May	NA	0.00025	0.11	0.55	0.28
	June	NA	< 0.0001	0.11	0.52	0.26
Total		NA	0.0012	0.66	2.8	1.8

Table 2.6-1. Building 854-Source (854-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
854-SRC	January	0	0	0	0
	February	0	0	0	0
	March	0	0	0	0
	April	0	0	0	0
	May	0	0	0	0
	June	0	0	0	0
Total		0	0	0	0

Table 2.6-2. Building 854-Proximal (854-PRX) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
854-PRX	January	NA	0	NA	0
	February	NA	0	NA	0
	March	NA	0	NA	0
	April	NA	614	NA	107,762
	May	NA	720	NA	154,103
	June	NA	539	NA	119,799
Total		NA	1,873	NA	381,664

Table 2.6-3. Building 854-Distal (854-DIS) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
854-DIS	January	NA	0	NA	0
	February	NA	0	NA	0
	March	NA	0	NA	0
	April	NA	0	NA	0
	May	NA	0	NA	30
	June	NA	0	NA	39
Total		NA	0	NA	69

Table 2.6-4. Building 854 Operable Unit volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2- DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
Building 854-Distal^a															
854-DIS-I	5/25/16	25	<0.5	0.71	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-DIS-E	5/25/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-DIS-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 854-Proximal^b															
854-PRX-I	4/6/16	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-PRX-E	4/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-PRX-E	5/2/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-PRX-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 854-Source^c															

Notes:

^a No samples collected until May due to system shutdown for extraction well evaluation and repair.

^b No samples collected until April due to system shutdown for freeze protection and nitrate sensor evaluations.

^c System offline the entire reporting period for construction upgrades.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.6-4 (Con't). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 854-Distal^a		
854-DIS-I	5/25/16	0 of 18
854-DIS-E	5/25/16	0 of 18
854-DIS-E	6/6/16	0 of 18
Building 854-Proximal^b		
854-PRX-I	4/6/16	0 of 18
854-PRX-E	4/6/16	0 of 18
854-PRX-E	5/2/16	0 of 18
854-PRX-E	6/6/16	0 of 18
Building 854-Source^c		

Notes:

^a No samples collected until May due to system shutdown for extraction well evaluation and repair.

^b No samples collected until April due to system shutdown for freeze protection and nitrate sensor evaluations.

^c System offline the entire reporting period for construction upgrades.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.6-5. Building 854 Operable Unit nitrate and perchlorate in ground water extraction and treatment system influent and effluent.

Location	Date	Nitrate as NO ₃ (mg/L)	Perchlorate (µg/L)
Building 854-Distal^a			
854-DIS-I	5/25/16	19	4.8 L
854-DIS-E	5/25/16	3.3	<4
854-DIS-E	6/6/16	1.8	<4
Building 854-Proximal^b			
854-PRX-I	4/6/16	38 D	4.5
854-PRX-I ^c	5/2/16	39	-
854-PRX-I	5/18/16	-	<4
854-PRX-I	6/6/16	39	-
854-PRX-E ^c	4/5/16	42	-
854-PRX-E	4/6/16	37 D	<4
854-PRX-E	5/2/16	41	<4
854-PRX-E	5/18/16	38 D	-
854-PRX-E	6/6/16	76 D	<4
854-PRX-E ^c	6/8/16b	40	-
854-PRX-E ^c	6/15/16	37	-
Building 854-Source^d			

Notes:

^a No samples collected until May due to system shutdown for extraction well evaluation and repair.

^b No samples collected until April due to system shutdown for freeze protection and nitrate sensor evaluations.

^c Extra nitrate samples to evaluate the nitrate sensor and effluent conditions.

^d System offline the entire reporting period for construction upgrades.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.6-6. Building 854 Operable Unit treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
854-SRC GWTS			
Influent Port	854-SRC-I	VOCs	Quarterly
		Perchlorate	Quarterly
		pH	Quarterly
Effluent Port	854-SRC-E	VOCs	Monthly
		Perchlorate	Monthly
		pH	Monthly
854-SRC SVTS			
Influent Port	W-854-1834-854-SRC-VI	No Monitoring Requirements	
Effluent Port	854-SRC-VE	VOCs	Weekly ^a
Intermediate GAC	854-SRC-VCF3I	VOCs	Weekly ^a
854-PRX GWTS			
Influent Port	W-854-03-854-PRX-I	VOCs	Quarterly
		Perchlorate	Quarterly
		Nitrate	Quarterly
		pH	Quarterly
Effluent Port	854-PRX-E	VOCs	Monthly
		Perchlorate	Monthly
		Nitrate	Monthly
		pH	Monthly
854-DIS GWTS			
Influent Port	W-854-2139-854-DIS-I	VOCs	Quarterly
		Perchlorate	Quarterly
		Nitrate	Quarterly
		pH	Quarterly
Effluent Port	854-DIS-E	VOCs	Monthly
		Perchlorate	Monthly
		Nitrate	Monthly
		pH	Monthly

Notes:

^a Weekly monitoring for VOCs will consist of the use of a flame-ionization detector, photo-ionization detector, or other District-approved VOC detection device.

One duplicate and one blank (given fictitious labels) shall be taken for every 12 samples.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.6-7. Building 854 Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-854-01	PTWM	Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-01	PTWM	Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-01	PTWM	Tnsc0	S	CMP	E300.0:PERC	4		
W-854-01	PTWM	Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-01	PTWM	Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-02	EW	Tnbs1-Tnsc0	A	CMP-TF	E300.0:NO3	2	N	
W-854-02	EW	Tnbs1-Tnsc0	S	DIS-TF	E300.0:PERC	1	N	Well location under construction.
W-854-02	EW	Tnbs1-Tnsc0	S	CMP-TF	E300.0:PERC	2	N	
W-854-02	EW	Tnbs1-Tnsc0	S	DIS-TF	E300.0:PERC	3		
W-854-02	EW	Tnbs1-Tnsc0	S	CMP-TF	E300.0:PERC	4		
W-854-02	EW	Tnbs1-Tnsc0	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-854-02	EW	Tnbs1-Tnsc0	S	CMP-TF	E624MOD:ALL	2	N	
W-854-02	EW	Tnbs1-Tnsc0	S	DIS-TF	E624MOD:ALL	3		
W-854-02	EW	Tnbs1-Tnsc0	S	CMP-TF	E624MOD:ALL	4		
W-854-03	EW	Tnbs1-Tnsc0	A	DIS-TF	AS:UISO	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	1	N	Well location under construction.
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	1	N	Well location under construction.
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	1	N	Well location under construction.
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	3		
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	3		
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	3		
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	4		
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	4		
W-854-03	EW	Tnbs1-Tnsc0	M	DIS-TF	E300.0:NO3	4		
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	1	N	Well location under construction.
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	I	DIS-TF	E300.0:PERC	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	3		
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	4		
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	2	Y	
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	3		
W-854-03	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	4		
W-854-04	PTWM	Tmss	A	CMP	E300.0:NO3	2	Y	
W-854-04	PTWM	Tmss	S	CMP	E300.0:PERC	2	Y	
W-854-04	PTWM	Tmss	S	CMP	E300.0:PERC	4		
W-854-04	PTWM	Tmss	S	CMP	E624MOD:ALL	2	Y	
W-854-04	PTWM	Tmss	S	CMP	E624MOD:ALL	4		
W-854-05	PTWM	Qls-Tnbs1	A	CMP	E300.0:NO3	2	Y	
W-854-05	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	2	Y	
W-854-05	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	4		
W-854-05	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-854-05	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	4		
W-854-06	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-06	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-06	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-06	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-06	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-07	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-07	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-07	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-07	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-07	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-08	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-08	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-08	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-08	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-08	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-09	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	N	Insufficient water.
W-854-09	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	N	Insufficient water.
W-854-09	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-09	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	N	Insufficient water.
W-854-09	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-10	PTWM	Qls-Tnbs1	A	CMP	E300.0:NO3	2	Y	

Table 2.6-7. Building 854 Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-854-10	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	2	Y	
W-854-10	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	4		
W-854-10	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-854-10	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	4		
W-854-11	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	N	DRY.
W-854-11	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	N	DRY.
W-854-11	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-11	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	N	DRY.
W-854-11	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-12	PTWM	Tmss	A	CMP	E300.0:NO3	2	N	Insufficient water.
W-854-12	PTWM	Tmss	S	CMP	E300.0:PERC	2	N	Insufficient water.
W-854-12	PTWM	Tmss	S	CMP	E300.0:PERC	4		
W-854-12	PTWM	Tmss	S	CMP	E624MOD:ALL	2	N	Insufficient water.
W-854-12	PTWM	Tmss	S	CMP	E624MOD:ALL	4		
W-854-13	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-13	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-13	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-13	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-13	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-14	PTWM	Qls-Tnbs1	A	CMP	E300.0:NO3	2	Y	
W-854-14	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	2	Y	
W-854-14	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	4		
W-854-14	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-854-14	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	4		
W-854-15	PTWM	Qls-Tnbs1	A	CMP	E300.0:NO3	2	Y	
W-854-15	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	2	Y	
W-854-15	PTWM	Qls-Tnbs1	S	CMP	E300.0:PERC	4		
W-854-15	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	2	Y	
W-854-15	PTWM	Qls-Tnbs1	S	CMP	E624MOD:ALL	4		
W-854-17	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-17	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-17	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-17	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-17	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-18A	PTMW	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-18A	PTMW	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-18A	PTMW	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-18A	PTMW	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-18A	PTMW	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-19	PTWM	Qls-Tnbs1	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
W-854-19	PTWM	Qls-Tnbs1	O	CMP	E300.0:PERC	2	N	To be sampled in 2017.
W-854-19	PTWM	Qls-Tnbs1	O	CMP	E624MOD:ALL	2	N	To be sampled in 2017.
W-854-45	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-45	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-45	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-45	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-45	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-1701	PTWM	Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-1701	PTWM	Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-1701	PTWM	Tnsc0	S	CMP	E300.0:PERC	4		
W-854-1701	PTWM	Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-1701	PTWM	Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-1707	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-1707	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-1707	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-1707	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-1707	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-1731	PTWM	Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-1731	PTWM	Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-1731	PTWM	Tnsc0	S	CMP	E300.0:PERC	4		
W-854-1731	PTWM	Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-1731	PTWM	Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-1822	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-1822	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-1822	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-1822	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-1822	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		

Table 2.6-7. Building 854 Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-854-1823	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-1823	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-1823	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-1823	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-1823	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-1902	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	N	DRY.
W-854-1902	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	N	DRY.
W-854-1902	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-1902	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	N	DRY.
W-854-1902	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-2115	PTWM	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-2115	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-2115	PTWM	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
W-854-2115	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-2115	PTWM	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-2139	EW	Tnbs1-Tnsc0	A	DIS-TF	AS:UISO	2	Y	
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:NO3	1	N	Well location under construction.
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:NO3	2	Y	
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:NO3	3		
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:NO3	4		
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	1	N	Well location under construction.
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	2	Y	
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	3		
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E300.0:PERC	4		
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	2	Y	
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	3		
W-854-2139	EW	Tnbs1-Tnsc0	Q	DIS-TF	E624MOD:ALL	4		
W-854-2218	EW	Tnbs1-Tnsc0	A	CMP-TF	E300.0:NO3	2	N	
W-854-2218	EW	Tnbs1-Tnsc0	S	DIS-TF	E300.0:PERC	1	N	Well location under construction.
W-854-2218	EW	Tnbs1-Tnsc0	S	CMP-TF	E300.0:PERC	2	N	
W-854-2218	EW	Tnbs1-Tnsc0	S	DIS-TF	E300.0:PERC	3		
W-854-2218	EW	Tnbs1-Tnsc0	S	CMP-TF	E300.0:PERC	4		
W-854-2218	EW	Tnbs1-Tnsc0	S	DIS-TF	E624MOD:ALL	1	N	Well location under construction.
W-854-2218	EW	Tnbs1-Tnsc0	S	CMP-TF	E624MOD:ALL	2	N	
W-854-2218	EW	Tnbs1-Tnsc0	S	DIS-TF	E624MOD:ALL	3		
W-854-2218	EW	Tnbs1-Tnsc0	S	CMP-TF	E624MOD:ALL	4		
W-854-2611	PTMW	Tnbs1/Tnsc0	A	CMP	E300.0:NO3	2	Y	
W-854-2611	PTMW	Tnbs1/Tnsc0	S	CMP	E300.0:PERC	2	Y	
W-854-2611	PTMW	Tnbs1/Tnsc0	S	CMP	E300.0:PERC	4		
W-854-2611	PTMW	Tnbs1/Tnsc0	S	CMP	E624MOD:ALL	2	Y	
W-854-2611	PTMW	Tnbs1/Tnsc0	S	CMP	E624MOD:ALL	4		
W-854-F2	PTWM	Qls-Tnbs1	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
W-854-F2	PTWM	Qls-Tnbs1	O	CMP	E300.0:PERC	2	N	To be sampled in 2017.
W-854-F2	PTWM	Qls-Tnbs1	O	CMP	E624MOD:ALL	2	N	To be sampled in 2017.
SPRING10	SPR	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	N	DRY.
SPRING10	SPR	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	N	DRY.
SPRING10	SPR	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
SPRING10	SPR	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	N	DRY.
SPRING10	SPR	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		
SPRING11	SPR	Tnbs1-Tnsc0	A	CMP	E300.0:NO3	2	Y	
SPRING11	SPR	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	2	Y	
SPRING11	SPR	Tnbs1-Tnsc0	S	CMP	E300.0:PERC	4		
SPRING11	SPR	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	2	Y	
SPRING11	SPR	Tnbs1-Tnsc0	S	CMP	E624MOD:ALL	4		

Table 2.6-8. Building 854-Source (854-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
854-SRC	January	0	0	0	0	NA	NA
	February	0	0	0	0	NA	NA
	March	0	0	0	0	NA	NA
	April	0	0	0	0	NA	NA
	May	0	0	0	0	NA	NA
	June	0	0	0	0	NA	NA
Total		0	0	0	0	NA	NA

Table 2.6-9. Building 854-Proximal (854-PRX) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
854-PRX	January	NA	0	0	0	NA	NA
	February	NA	0	0	0	NA	NA
	March	NA	0	0	0	NA	NA
	April	NA	5.7	1.8	16	NA	NA
	May	NA	8.2	0	23	NA	NA
	June	NA	6.4	0	18	NA	NA
Total		NA	20	1.8	56	NA	NA

Table 2.6-10. Building 854-Distal (854-DIS) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
854-DIS	January	NA	0	0	0	NA	NA
	February	NA	0	0	0	NA	NA
	March	NA	0	0	0	NA	NA
	April	NA	0	0	0	NA	NA
	May	NA	0.0029	0.00054	0.0021	NA	NA
	June	NA	0.0038	0.00071	0.0028	NA	NA
Total		NA	0.0067	0.0012	0.0049	NA	NA

Table 2.7-1. Building 832-Source (832-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
832-SRC	January	0	0	0	0
	February	528	528	168	6,148
	March	696	696	217	8,776
	April	648	648	176	6,742
	May	336	336	81	4,051
	June	408	408	118	6,388
Total		2,616	2,616	760	32,105

Table 2.7-2. Building 830-Source (830-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
830-SRC	January	0	0	0	0
	February	0	451	0	255,974
	March	221	695	152	315,119
	April	605	647	509	251,899
	May	749	760	640	297,162
	June	674	696	498	271,985
Total		2,249	3,249	1,799	1,392,139

Table 2.7-3. Building 830-Distal South (830-DISS) volumes of ground water and soil vapor extracted and discharged, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of cf)	Volume of ground water discharged (gal)
830-DISS	January	NA	0	NA	0
	February	NA	0	NA	0
	March	NA	0	NA	0
	April	NA	600	NA	97,468
	May	NA	312	NA	56,559
	June	NA	576	NA	99,876
Total		NA	1,488	NA	253,903

Table 2.7-4. Building 832 Canyon Operable Unit volatile organic compounds (VOCs) in ground water extraction and treatment system influent and effluent.

Location	Date	TCE (µg/L)	PCE (µg/L)	cis-1,2- DCE (µg/L)	trans- 1,2- DCE (µg/L)	Carbon tetra- chloride (µg/L)	Chloro- form (µg/L)	1,1- DCA (µg/L)	1,2- DCA (µg/L)	1,1- DCE (µg/L)	1,1,1- TCA (µg/L)	1,1,2- TCA (µg/L)	Freon 11 (µg/L)	Freon 113 (µg/L)	Vinyl chloride (µg/L)
Building 830-Distal South^a															
Building 830-Source^b															
830-SRC-I	2/16/16	1,200 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D
830-SRC-I	4/4/16	700 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D	<2.5 D
830-SRC-I2	2/16/16	15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-I2	4/4/16	17	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-E	2/16/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-E	3/1/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-E	4/4/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-E	5/2/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-E	6/6/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 832-Source^b															
832-SRC-I	2/16/16	35	<0.5	0.56	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-I	4/4/16	45	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-E	2/16/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-E	3/1/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-E	4/4/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-E	5/2/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-E	6/20/16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:

^a No influent or effluent monitoring required; VOC treatment at CGSA GWTS.

^b No sampling in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.7-4 (Con't). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 830-Distal South^a		
Building 830-Source^b		
830-SRC-I	2/16/16	0 of 18
830-SRC-I	4/4/16	0 of 18
830-SRC-I2	2/16/16	0 of 18
830-SRC-I2	4/4/16	0 of 18
830-SRC-E	2/16/16	0 of 18
830-SRC-E	3/1/16	0 of 18
830-SRC-E	4/4/16	0 of 18
830-SRC-E	5/2/16	0 of 18
830-SRC-E	6/6/16	0 of 18
Building 832-Source^b		
832-SRC-I	2/16/16	0 of 18
832-SRC-I	4/4/16	0 of 18
832-SRC-E	2/16/16	0 of 18
832-SRC-E	3/1/16	0 of 18
832-SRC-E	4/4/16	0 of 18
832-SRC-E	5/2/16	0 of 18
832-SRC-E	6/20/16	0 of 18

Notes:

^a No influent or effluent monitoring required; VOC treatment at CGSA GWTS.

^b No sampling in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.7-5. Building 832 Canyon Operable Unit perchlorate in ground water extraction and treatment system influent and effluent.

Location	Date	Nitrate as NO3 (mg/L)	Perchlorate ($\mu\text{g/L}$)
Building 830-Distal South^a			
830-DISS-I	4/6/16	61 D	<4
830-DISS-E	4/6/16	-	<4
830-DISS-E	5/3/16	-	<4
830-DISS-E	6/6/16	-	<4
Building 830-Source^b			
830-SRC-I	2/16/16	96 D	4.8
830-SRC-I	4/4/16	97 D	<4
830-SRC-E	2/16/16	-	<4
830-SRC-E	3/1/16	-	<4
830-SRC-E	4/4/16	-	<4
830-SRC-E	5/2/16	-	<4
830-SRC-E	6/6/16	-	<4
Building 832-Source^b			
832-SRC-I	2/16/16	98 D	7.1
832-SRC-I	4/4/16	93 D	4
832-SRC-E	2/16/16	-	<4
832-SRC-E	3/1/16	-	<4
832-SRC-E	4/4/16	-	<4
832-SRC-E	5/2/16	-	<4
832-SRC-E	6/20/16	-	<4

Notes:

^a No influent or effluent monitoring until April due to shut down for freeze protection and non-operations of CGSA GWTS.

^b No sampling in January due to shut down for freeze protection.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.7-6. Building 832 Canyon Operable Unit treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
<i>832-SRC GWTS</i>			
Influent Port	832-SRC-I	VOCs	Quarterly
		Perchlorate	Quarterly
		pH	Quarterly
Effluent Port	832-SRC-E	VOCs	Monthly
		Perchlorate	Monthly
		PH	Monthly
<i>832-SRC SVTS</i>			
Influent Port	832-SRC-VI	No Monitoring Requirements	
Effluent Port	832-SRC-VE	VOCs	Weekly ^a
Intermediate GAC	832-SRC-VCF3I	VOCs	Weekly ^a
<i>830-SRC GWTS</i>			
Influent Port	830-SRC-I	VOCs	Quarterly
		Perchlorate	Quarterly
		PH	Quarterly
Effluent Port	830-SRC-E	VOCs	Monthly
		Perchlorate	Monthly
		PH	Monthly
<i>830-SRC SVTS</i>			
Influent Port	830-SRC-VI	No Monitoring Requirements	
Effluent Port	830-SRC-VE	VOCs	Weekly ^a
Intermediate GAC	830-SRC-VCF3I	VOCs	Weekly ^a
<i>830-DISS GWTS</i>			
Influent Port	830-DISS-I	Perchlorate	Quarterly
		pH	Quarterly
Effluent Port	830-DISS-E	Perchlorate	Monthly
		pH	Monthly

Notes:

^a Weekly monitoring for VOCs will consist of the use of a flame-ionization detector, photo-ionization detector, or other District-approved VOC detection device.

One duplicate and one blank (given fictitious labels) shall be taken for every 12 samples.

See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
SPRING3	SPR	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
SPRING3	SPR	Qal/WBR	A	CMP	E300.0:PERC	1	N	DRY.
SPRING3	SPR	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
SPRING3	SPR	Qal/WBR	S	CMP	E624MOD:ALL	3		
SPRING4	SPR	Tpsg-Tps	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
SPRING4	SPR	Tpsg-Tps	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
SPRING4	SPR	Tpsg-Tps	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
SVI-830-031	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	Y	
SVI-830-031	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	Y	
SVI-830-031	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
SVI-830-031	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
SVI-830-032	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	Y	
SVI-830-032	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	Y	
SVI-830-032	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
SVI-830-032	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
SVI-830-033	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	Insufficient water. Partial sampling.
SVI-830-033	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	Insufficient water. Partial sampling.
SVI-830-033	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	Insufficient water. Partial sampling.
SVI-830-033	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
SVI-830-035	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	Y	
SVI-830-035	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	Y	
SVI-830-035	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
SVI-830-035	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-830-04A	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-04A	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-830-04A	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-04A	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-05	PTMW	Tnsc1c	A	CMP	E300.0:NO3	1	Y	
W-830-05	PTMW	Tnsc1c	A	CMP	E300.0:PERC	1	Y	
W-830-05	PTMW	Tnsc1c	S	CMP	E624MOD:ALL	1	Y	
W-830-05	PTMW	Tnsc1c	S	CMP	E624MOD:ALL	3		
W-830-07	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
W-830-07	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	DRY.
W-830-07	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
W-830-07	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-830-09	PTMW	UTnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-830-09	PTMW	UTnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-09	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-830-09	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-10	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-10	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-830-10	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-10	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-11	PTMW	Tnsc1c	A	CMP	E300.0:NO3	1	Y	
W-830-11	PTMW	Tnsc1c	A	CMP	E300.0:PERC	1	Y	
W-830-11	PTMW	Tnsc1c	S	CMP	E624MOD:ALL	1	Y	
W-830-11	PTMW	Tnsc1c	S	CMP	E624MOD:ALL	3		
W-830-12	GW	LTnbs1	S	CMP	E300.0:NO3	1	Y	
W-830-12	GW	LTnbs1	S	CMP	E300.0:NO3	3		
W-830-12	GW	LTnbs1	S	CMP	E300.0:PERC	1	Y	
W-830-12	GW	LTnbs1	S	CMP	E300.0:PERC	3		
W-830-12	GW	LTnbs1	Q	CMP	E624MOD:ALL	1	Y	
W-830-12	GW	LTnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-830-12	GW	LTnbs1	Q	CMP	E624MOD:ALL	3		
W-830-12	GW	LTnbs1	Q	CMP	E624MOD:ALL	4		
W-830-13	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-830-13	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	Y	
W-830-13	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-830-13	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-830-13	PTMW	Tnbs2	E	CMP	E8330LOW:ALL	1	Y	
W-830-14	PTMW	Tnsc1b	E	CMP	E300.0:NO3	1	Y	
W-830-14	PTMW	Tnsc1b	E	CMP	E300.0:PERC	1	Y	
W-830-14	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-14	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-15	GW	UTnbs1	S	CMP	E300.0:NO3	1	Y	
W-830-15	GW	UTnbs1	S	CMP	E300.0:NO3	3		
W-830-15	GW	UTnbs1	S	CMP	E300.0:PERC	1	Y	

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-830-15	GW	UTnbs1	S	CMP	E300.0:PERC	3		
W-830-15	GW	UTnbs1	Q	CMP	E624MOD:ALL	1	Y	
W-830-15	GW	UTnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-830-15	GW	UTnbs1	Q	CMP	E624MOD:ALL	3		
W-830-15	GW	UTnbs1	Q	CMP	E624MOD:ALL	4		
W-830-16	PTMW	Tnsc1b	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-830-16	PTMW	Tnsc1b	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-16	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-16	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-17	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	N	No well access for sampling or measurement.
W-830-17	PTMW	Tnbs2	A	CMP	E300.0:PERC	1	N	No well access for sampling or measurement.
W-830-17	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	N	No well access for sampling or measurement.
W-830-17	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-830-18	PTMW	UTnbs1	E	CMP	E300.0:NO3	1	N	No well access for sampling or measurement.
W-830-18	PTMW	UTnbs1	E	CMP	E300.0:PERC	1	N	No well access for sampling or measurement.
W-830-18	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	N	No well access for sampling or measurement.
W-830-18	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-19	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-830-19	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-830-19	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-19	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-19	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-19	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-19	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-20	PTMW	UTnbs1	E	CMP	E300.0:NO3	1	Y	
W-830-20	PTMW	UTnbs1	E	CMP	E300.0:PERC	1	Y	
W-830-20	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-830-20	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-21	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-21	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-830-21	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-21	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-22	PTMW	Tnsc1a	A	CMP	E300.0:NO3	1	Y	
W-830-22	PTMW	Tnsc1a	A	CMP	E300.0:PERC	1	Y	
W-830-22	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	1	Y	
W-830-22	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	3		
W-830-25	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	N	DRY.
W-830-25	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	N	DRY.
W-830-25	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	N	DRY.
W-830-25	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-26	PTMW	UTnbs1	E	CMP	E300.0:NO3	1	N	Insufficient water.
W-830-26	PTMW	UTnbs1	E	CMP	E300.0:PERC	1	N	Insufficient water.
W-830-26	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-830-26	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-27	PTMW	Tnsc1a	A	CMP	E300.0:NO3	1	Y	
W-830-27	PTMW	Tnsc1a	A	CMP	E300.0:PERC	1	Y	
W-830-27	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	1	Y	
W-830-27	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	3		
W-830-28	PTMW	UTnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-830-28	PTMW	UTnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-28	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-830-28	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-29	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
W-830-29	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
W-830-29	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-830-29	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
W-830-30	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	Y	
W-830-30	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	Y	
W-830-30	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
W-830-30	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-830-34	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	Insufficient water. Partial sampling.

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-830-34	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	Insufficient water. Partial sampling.
W-830-34	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	Insufficient water. Partial sampling.
W-830-34	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-830-34	PTMW	Qal/WBR	E	CMP	E833LOW:ALL	1	N	Insufficient water. Partial sampling.
W-830-49	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-830-49	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-830-49	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-49	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-49	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-49	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-49	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-50	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-50	PTMW	Tnsc1b	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-50	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-50	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-51	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	N	Well location under construction.
W-830-51	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	N	Well location under construction.
W-830-51	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-51	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	N	Well location under construction.
W-830-51	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-51	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-51	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-52	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	N	Well location under construction.
W-830-52	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	N	Well location under construction.
W-830-52	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-52	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	N	Well location under construction.
W-830-52	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	N	Insufficient water.
W-830-52	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-52	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-53	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	N	Well location under construction.
W-830-53	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	N	Well location under construction.
W-830-53	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-53	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	N	Well location under construction.
W-830-53	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-53	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-53	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-54	PTMW	Tnsc1c	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-830-54	PTMW	Tnsc1c	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-54	PTMW	Tnsc1c	S	CMP	E624MOD:ALL	1	Y	
W-830-54	PTMW	Tnsc1c	S	CMP	E624MOD:ALL	3		
W-830-55	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-55	PTMW	Tnsc1b	E	CMP	E300.0:PERC	1	Y	
W-830-55	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-55	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-56	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-56	PTMW	Tnsc1b	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-56	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-56	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-57	EW	UTnbs1	A	CMP-TF	E300.0:NO3	1	Y	
W-830-57	EW	UTnbs1	A	CMP-TF	E300.0:PERC	1	Y	
W-830-57	EW	UTnbs1	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-57	EW	UTnbs1	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-57	EW	UTnbs1	S	CMP-TF	E624MOD:ALL	3		
W-830-57	EW	UTnbs1	S	DIS-TF	E624MOD:ALL	4		
W-830-58	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-58	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-830-58	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-58	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-59	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-830-59	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-830-59	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-59	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-59	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-59	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-59	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-60	EW	UTnbs1	A	CMP-TF	E300.0:NO3	1	Y	
W-830-60	EW	UTnbs1	A	CMP-TF	E300.0:PERC	1	Y	

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-830-60	EW	UTnbs1	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-60	EW	UTnbs1	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-60	EW	UTnbs1	S	CMP-TF	E624MOD:ALL	3		
W-830-60	EW	UTnbs1	S	DIS-TF	E624MOD:ALL	4		
W-830-1730	GW	Tnsc1b	S	CMP	E300.0:NO3	1	Y	
W-830-1730	GW	Tnsc1b	S	CMP	E300.0:NO3	3		
W-830-1730	GW	Tnsc1b	S	CMP	E300.0:PERC	1	Y	
W-830-1730	GW	Tnsc1b	S	CMP	E300.0:PERC	3		
W-830-1730	GW	Tnsc1b	Q	CMP	E624MOD:ALL	1	Y	
W-830-1730	GW	Tnsc1b	Q	CMP	E624MOD:ALL	2	Y	
W-830-1730	GW	Tnsc1b	Q	CMP	E624MOD:ALL	3		
W-830-1730	GW	Tnsc1b	Q	CMP	E624MOD:ALL	4		
W-830-1807	EW	Qal/WBR-Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-830-1807	EW	Qal/WBR-Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-830-1807	EW	Qal/WBR-Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-830-1807	EW	Qal/WBR-Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-1807	EW	Qal/WBR-Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-1807	EW	Qal/WBR-Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-830-1807	EW	Qal/WBR-Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-830-1829	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-1829	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-830-1829	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-1829	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-1830	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-830-1830	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-830-1830	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-1830	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-1831	PTMW	Tnsc1b	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-830-1831	PTMW	Tnsc1b	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-830-1831	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-830-1831	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-1832	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	Y	
W-830-1832	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	Y	
W-830-1832	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-830-1832	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-2213	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	N	DRY.
W-830-2213	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	N	DRY.
W-830-2213	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	N	DRY.
W-830-2213	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-830-2214	EW	Tnsc1a	A	CMP-TF	E300.0:NO3	1	Y	
W-830-2214	EW	Tnsc1a	A	CMP-TF	E300.0:PERC	1	Y	
W-830-2214	EW	Tnsc1a	A	DIS-TF	E300.0:PERC	3		
W-830-2214	EW	Tnsc1a	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-2214	EW	Tnsc1a	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-2214	EW	Tnsc1a	S	CMP-TF	E624MOD:ALL	3		
W-830-2214	EW	Tnsc1a	S	DIS-TF	E624MOD:ALL	4		
W-830-2215	EW	UTnbs1	A	CMP-TF	E300.0:NO3	1	Y	
W-830-2215	EW	UTnbs1	A	CMP-TF	E300.0:PERC	1	Y	
W-830-2215	EW	UTnbs1	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-2215	EW	UTnbs1	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-2215	EW	UTnbs1	S	CMP-TF	E624MOD:ALL	3		
W-830-2215	EW	UTnbs1	S	DIS-TF	E624MOD:ALL	4		
W-830-2216	EW	Tnbs2	A	CMP-TF	E300.0:NO3	1	N	Well location under construction.
W-830-2216	EW	Tnbs2	A	CMP-TF	E300.0:PERC	1	N	Well location under construction.
W-830-2216	EW	Tnbs2	A	DIS-TF	E300.0:PERC	3		
W-830-2216	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	1	N	Well location under construction.
W-830-2216	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-2216	EW	Tnbs2	S	CMP-TF	E624MOD:ALL	3		
W-830-2216	EW	Tnbs2	S	DIS-TF	E624MOD:ALL	4		
W-830-2216	EW	Tnbs2	O	CMP-TF	E8330LOW:ALL	1	N	To be sampled in 2017.
W-830-2311	PTMW	Tnsc1a	A	CMP	E300.0:NO3	1	Y	
W-830-2311	PTMW	Tnsc1a	A	CMP	E300.0:PERC	1	Y	
W-830-2311	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	1	Y	
W-830-2311	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	3		
W-830-2701	PTMW	Tnsc1a	A	CMP-TF	E300.0:NO3	1	Y	
W-830-2701	PTMW	Tnsc1a	A	CMP-TF	E300.0:PERC	1	Y	
W-830-2701	PTMW	Tnsc1a	A	DIS-TF	E300.0:PERC	3		

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-830-2701	PTMW	Tnsc1a	S	CMP-TF	E624MOD:ALL	1	Y	
W-830-2701	PTMW	Tnsc1a	S	DIS-TF	E624MOD:ALL	2	Y	
W-830-2701	PTMW	Tnsc1a	S	CMP-TF	E624MOD:ALL	3		
W-830-2701	PTMW	Tnsc1a	S	DIS-TF	E624MOD:ALL	4		
W-830-2806	PTMW	Tnsc1a	S	CMP	E300.0:NO3	1	Y	
W-830-2806	PTMW	Tnsc1a	S	CMP	E300.0:NO3	3		
W-830-2806	PTMW	Tnsc1a	S	CMP	E300.0:PERC	1	Y	
W-830-2806	PTMW	Tnsc1a	S	CMP	E300.0:PERC	3		
W-830-2806	PTMW	Tnsc1a	Q	CMP	E624MOD:ALL	1	Y	
W-830-2806	PTMW	Tnsc1a	Q	CMP	E624MOD:ALL	2	Y	
W-830-2806	PTMW	Tnsc1a	Q	CMP	E624MOD:ALL	3		
W-830-2806	PTMW	Tnsc1a	Q	CMP	E624MOD:ALL	4		
W-830-3101	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	N	Inoperable equipment.
W-830-3101	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	N	Inoperable equipment.
W-830-3101	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	N	Inoperable equipment.
W-830-3101	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
W-830-3102	PTMW	UTnbs1	1	DIS	DWMETALS:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	E200.7:SI	1	Y	
W-830-3102	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	Y	
W-830-3102	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	E300.0:PERC	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	E624B:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-830-3102	PTMW	UTnbs1	1	DIS	E8330LOW:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	E900:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	E906:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	GENMIN:ALL	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	KPA:UTOT	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	MS:UIISO	1	Y	
W-830-3102	PTMW	UTnbs1	1	DIS	TBOS:ALL	1	Y	
W-831-01	PTMW	LTnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-831-01	PTMW	LTnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-831-01	PTMW	LTnbs1	O	CMP	E624MOD:ALL	1	N	To be sampled in 2017.
W-832-01	EW	Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-832-01	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-832-01	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-832-01	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-832-01	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-832-01	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-832-01	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-832-06	PTMW	Tnsc1a	A	CMP	E300.0:NO3	1	Y	
W-832-06	PTMW	Tnsc1a	A	CMP	E300.0:PERC	1	Y	
W-832-06	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	1	Y	
W-832-06	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	3		
W-832-09	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
W-832-09	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
W-832-09	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-832-09	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
W-832-10	EW	Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-832-10	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-832-10	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-832-10	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-832-10	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-832-10	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-832-11	EW	Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-832-11	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-832-11	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-832-11	EW	Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-832-11	EW	Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-832-12	EW	Qal/WBR-Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-832-12	EW	Qal/WBR-Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-832-12	EW	Qal/WBR-Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-832-12	EW	Qal/WBR-Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-832-12	EW	Qal/WBR-Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-832-12	EW	Qal/WBR-Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-832-12	EW	Qal/WBR-Tnsc1b	S	DIS-TF	E624MOD:ALL	4		

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-832-13	PTMW	Qal/WBR-Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-832-13	PTMW	Qal/WBR-Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-832-13	PTMW	Qal/WBR-Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-832-13	PTMW	Qal/WBR-Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-14	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-832-14	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	N	Insufficient water.
W-832-14	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-832-14	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-15	EW	Qal/WBR-Tnsc1b	A	CMP-TF	E300.0:NO3	1	Y	
W-832-15	EW	Qal/WBR-Tnsc1b	A	DIS-TF	E300.0:NO3	3		
W-832-15	EW	Qal/WBR-Tnsc1b	A	CMP-TF	E300.0:PERC	1	Y	
W-832-15	EW	Qal/WBR-Tnsc1b	A	DIS-TF	E300.0:PERC	3		
W-832-15	EW	Qal/WBR-Tnsc1b	S	CMP-TF	E624MOD:ALL	1	Y	
W-832-15	EW	Qal/WBR-Tnsc1b	S	DIS-TF	E624MOD:ALL	2	Y	
W-832-15	EW	Qal/WBR-Tnsc1b	S	CMP-TF	E624MOD:ALL	3		
W-832-15	EW	Qal/WBR-Tnsc1b	S	DIS-TF	E624MOD:ALL	4		
W-832-15	EW	Qal/WBR-Tnsc1b	E	CMP-TF	E8330LOW:ALL	2	Y	
W-832-16	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-832-16	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	N	Insufficient water.
W-832-16	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-832-16	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-17	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-832-17	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	N	Insufficient water.
W-832-17	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	N	Insufficient water.
W-832-17	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-18	PTMW	Qal/WBR-Tnsc1b	A	CMP	E300.0:NO3	1	N	DRY.
W-832-18	PTMW	Qal/WBR-Tnsc1b	A	CMP	E300.0:PERC	1	N	DRY.
W-832-18	PTMW	Qal/WBR-Tnsc1b	S	CMP	E624MOD:ALL	1	N	DRY.
W-832-18	PTMW	Qal/WBR-Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-19	PTMW	Qal/WBR-Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-832-19	PTMW	Qal/WBR-Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-832-19	PTMW	Qal/WBR-Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-832-19	PTMW	Qal/WBR-Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-20	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	N	DRY.
W-832-20	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	N	DRY.
W-832-20	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	N	DRY.
W-832-20	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-21	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
W-832-21	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	DRY.
W-832-21	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
W-832-21	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-22	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	N	DRY.
W-832-22	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	N	DRY.
W-832-22	PTMW	UTnbs1	A	CMP	E624MOD:ALL	1	N	DRY.
W-832-23	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-832-23	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-832-23	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-832-23	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-24	PTMW	Tnsc1a	A	CMP	E300.0:NO3	1	Y	
W-832-24	PTMW	Tnsc1a	A	CMP	E300.0:PERC	1	Y	
W-832-24	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	1	Y	
W-832-24	PTMW	Tnsc1a	S	CMP	E624MOD:ALL	3		
W-832-25	EW	Tnsc1a	A	CMP-TF	E300.0:PERC	1	Y	
W-832-25	EW	Tnsc1a	A	DIS-TF	E300.0:PERC	3		
W-832-25	EW	Tnsc1a	S	CMP-TF	E624MOD:ALL	1	Y	
W-832-25	EW	Tnsc1a	S	DIS-TF	E624MOD:ALL	2	Y	
W-832-25	EW	Tnsc1a	S	CMP-TF	E624MOD:ALL	3		
W-832-25	EW	Tnsc1a	S	DIS-TF	E624MOD:ALL	4		
W-832-1927	PTMW	Tnsc1b	A	CMP	E300.0:NO3	1	Y	
W-832-1927	PTMW	Tnsc1b	A	CMP	E300.0:PERC	1	Y	
W-832-1927	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	1	Y	
W-832-1927	PTMW	Tnsc1b	S	CMP	E624MOD:ALL	3		
W-832-2112	GW	UTnbs1	S	CMP	E300.0:NO3	1	Y	
W-832-2112	GW	UTnbs1	S	CMP	E300.0:NO3	3		
W-832-2112	GW	UTnbs1	S	CMP	E300.0:PERC	1	Y	
W-832-2112	GW	UTnbs1	S	CMP	E300.0:PERC	3		
W-832-2112	GW	UTnbs1	Q	CMP	E624MOD:ALL	1	Y	

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-832-2112	GW	UTnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-832-2112	GW	UTnbs1	Q	CMP	E624MOD:ALL	3		
W-832-2112	GW	UTnbs1	Q	CMP	E624MOD:ALL	4		
W-832-2906	PTMW	UTnbs1	S	CMP	E300.0:NO3	1	Y	
W-832-2906	PTMW	UTnbs1	S	CMP	E300.0:NO3	3		
W-832-2906	PTMW	UTnbs1	S	CMP	E300.0:PERC	1	Y	
W-832-2906	PTMW	UTnbs1	S	CMP	E300.0:PERC	3		
W-832-2906	PTMW	UTnbs1	Q	CMP	E624MOD:ALL	1	Y	
W-832-2906	PTMW	UTnbs1	Q	CMP	E624MOD:ALL	2	Y	
W-832-2906	PTMW	UTnbs1	Q	CMP	E624MOD:ALL	3		
W-832-2906	PTMW	UTnbs1	Q	CMP	E624MOD:ALL	4		
W-832-3015	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
W-832-3015	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	DRY.
W-832-3015	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
W-832-3015	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-3016	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	No access to well location.
W-832-3016	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	No access to well location.
W-832-3016	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-832-3016	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-3017	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	No access to well location.
W-832-3017	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	No access to well location.
W-832-3017	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-832-3017	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-3018	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	No access to well location.
W-832-3018	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	No access to well location.
W-832-3018	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-832-3018	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-3019	EW	Tnscla	A	CMP	E300.0:NO3	1	Y	
W-832-3019	EW	Tnscla	A	CMP	E300.0:PERC	1	Y	
W-832-3019	EW	Tnscla	Q	DIS	E300.0:PERC	2	Y	
W-832-3019	EW	Tnscla	S	CMP	E624MOD:ALL	1	Y	
W-832-3019	EW	Tnscla	S	DIS	E624MOD:ALL	2	Y	
W-832-3019	EW	Tnscla	S	CMP	E624MOD:ALL	3		
W-832-3020	PTMW	Tnscla	A	CMP	E300.0:NO3	1	Y	
W-832-3020	PTMW	Tnscla	A	CMP	E300.0:PERC	1	Y	
W-832-3020	PTMW	Tnscla	Q	DIS	E300.0:PERC	2	Y	
W-832-3020	PTMW	Tnscla	S	CMP	E624MOD:ALL	1	Y	
W-832-3020	PTMW	Tnscla	S	DIS	E624MOD:ALL	2	Y	
W-832-3020	PTMW	Tnscla	S	CMP	E624MOD:ALL	3		
W-832-3103	PTMW	UTnbs1	A	CMP	E300.0:NO3	1	Y	
W-832-3103	PTMW	UTnbs1	A	CMP	E300.0:PERC	1	Y	
W-832-3103	PTMW	UTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-832-3103	PTMW	UTnbs1	S	CMP	E624MOD:ALL	3		
W-832-3209	GW	Tnscla	1	UK	DWMETALS:ALL	1	Y	
W-832-3209	GW	Tnscla	1	UK	E200.7:SI	1	Y	
W-832-3209	GW	Tnscla	1	UK	E300.0:PERC	1	Y	
W-832-3209	GW	Tnscla	1	UK	E300.0:PERC	1	Y	
W-832-3209	GW	Tnscla	1	UK	E624B:ALL	1	Y	
W-832-3209	GW	Tnscla	1	UK	E624MOD:ALL	1	Y	
W-832-3209	GW	Tnscla	S	CMP	E624MOD:ALL	3		
W-832-3209	GW	Tnscla	1	UK	E8330LOW:ALL	1	Y	
W-832-3209	GW	Tnscla	1	UK	E900:ALL	1	Y	
W-832-3209	GW	Tnscla	1	UK	E906:ALL	1	Y	
W-832-3209	GW	Tnscla	1	UK	GENMIN:ALL	1	Y	
W-832-3209	GW	Tnscla	1	UK	KPA:UTOT	1	Y	
W-832-3209	GW	Tnscla	1	UK	MS:UISO	1	Y	
W-832-3209	GW	Tnscla	1	UK	TBOS:ALL	1	Y	
W-832-3210	GW	Tnscla	1	UK	DWMETALS:ALL	1	Y	
W-832-3210	GW	Tnscla	1	UK	E200.7:SI	1	Y	
W-832-3210	GW	Tnscla	1	UK	E300.0:PERC	1	Y	
W-832-3210	GW	Tnscla	1	UK	E300.0:PERC	1	Y	
W-832-3210	GW	Tnscla	1	UK	E624B:ALL	1	Y	
W-832-3210	GW	Tnscla	1	UK	E624MOD:ALL	1	Y	
W-832-3210	GW	Tnscla	S	CMP	E624MOD:ALL	3		
W-832-3210	GW	Tnscla	1	UK	E8330LOW:ALL	1	Y	
W-832-3210	GW	Tnscla	1	UK	E900:ALL	1	Y	
W-832-3210	GW	Tnscla	1	UK	E906:ALL	1	Y	

Table 2.7-7. Building 832 Canyon Operable Unit ground and surface water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-832-3210	GW	Tnsc1a	1	UK	GENMIN:ALL	1	Y	
W-832-3210	GW	Tnsc1a	1	UK	KPA:UTOT	1	Y	
W-832-3210	GW	Tnsc1a	1	UK	MS:UISO	1	Y	
W-832-3210	GW	Tnsc1a	1	UK	TBOS:ALL	1	Y	
W-832-SC1	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	No access to well location.
W-832-SC1	PTMW	Qal/WBR	A	CMP	E300.0:PERC	1	N	No access to well location.
W-832-SC1	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	No access to well location.
W-832-SC1	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-SC2	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
W-832-SC2	PTMW	Qal/WBR	E	CMP	E300.0:PERC	1	N	DRY.
W-832-SC2	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
W-832-SC2	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-SC3	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	Y	
W-832-SC3	PTMW	Qal/WBR	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-832-SC3	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	Y	
W-832-SC3	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-832-SC4	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
W-832-SC4	PTMW	Qal/WBR	E	CMP	E300.0:PERC	1	N	DRY.
W-832-SC4	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
W-832-SC4	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-870-01	PTMW	Qal/WBR	A	CMP	E300.0:NO3	1	N	DRY.
W-870-01	PTMW	Qal/WBR	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-870-01	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	1	N	DRY.
W-870-01	PTMW	Qal/WBR	S	CMP	E624MOD:ALL	3		
W-870-02	PTMW	Tnbs2	A	CMP	E300.0:NO3	1	Y	
W-870-02	PTMW	Tnbs2	E	CMP	E300.0:PERC	1	Y	
W-870-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	1	Y	
W-870-02	PTMW	Tnbs2	S	CMP	E624MOD:ALL	3		
W-880-01	GW	Tnbs2	S	CMP	E300.0:NO3	1	Y	
W-880-01	GW	Tnbs2	S	CMP	E300.0:NO3	3		
W-880-01	GW	Tnbs2	S	CMP	E300.0:PERC	1	Y	
W-880-01	GW	Tnbs2	S	CMP	E300.0:PERC	3		
W-880-01	GW	Tnbs2	Q	CMP	E624MOD:ALL	1	Y	
W-880-01	GW	Tnbs2	Q	CMP	E624MOD:ALL	2	Y	
W-880-01	GW	Tnbs2	Q	CMP	E624MOD:ALL	3		
W-880-01	GW	Tnbs2	Q	CMP	E624MOD:ALL	4		
W-880-01	GW	Tnbs2	S	CMP	E8330LOW:ALL	1	Y	
W-880-01	GW	Tnbs2	S	CMP	E8330LOW:ALL	3		
W-880-02	GW	Qal/WBR	S	CMP	E300.0:NO3	1	N	Insufficient water. Partial sampling.
W-880-02	GW	Qal/WBR	S	CMP	E300.0:NO3	3		
W-880-02	GW	Qal/WBR	S	CMP	E300.0:PERC	1	N	Insufficient water. Partial sampling.
W-880-02	GW	Qal/WBR	S	CMP	E300.0:PERC	3		
W-880-02	GW	Qal/WBR	Q	CMP	E624MOD:ALL	1	N	Insufficient water. Partial sampling.
W-880-02	GW	Qal/WBR	Q	CMP	E624MOD:ALL	2	Y	
W-880-02	GW	Qal/WBR	Q	CMP	E624MOD:ALL	3		
W-880-02	GW	Qal/WBR	Q	CMP	E624MOD:ALL	4		
W-880-02	GW	Qal/WBR	S	CMP	E8330LOW:ALL	1	N	Insufficient water. Partial sampling.
W-880-02	GW	Qal/WBR	S	CMP	E8330LOW:ALL	3		
W-880-03	GW	Tnsc1b	S	CMP	E300.0:NO3	1	Y	
W-880-03	GW	Tnsc1b	S	CMP	E300.0:NO3	3		
W-880-03	GW	Tnsc1b	S	CMP	E300.0:PERC	1	Y	
W-880-03	GW	Tnsc1b	S	CMP	E300.0:PERC	3		
W-880-03	GW	Tnsc1b	Q	CMP	E624MOD:ALL	1	Y	
W-880-03	GW	Tnsc1b	Q	CMP	E624MOD:ALL	2	Y	
W-880-03	GW	Tnsc1b	Q	CMP	E624MOD:ALL	3		
W-880-03	GW	Tnsc1b	Q	CMP	E624MOD:ALL	4		
W-880-03	GW	Tnsc1b	S	CMP	E8330LOW:ALL	1	Y	
W-880-03	GW	Tnsc1b	S	CMP	E8330LOW:ALL	3		

Table 2.7-8. Building 832-Source (832-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
832-SRC	January	0	0	0	0	NA	NA
	February	2.5	1.6	0.10	2.3	NA	NA
	March	3.2	2.8	0.15	3.4	NA	NA
	April	0.51	2.7	0.094	2.6	NA	NA
	May	0.23	1.8	0.056	1.6	NA	NA
	June	0.34	3.3	0.13	2.6	NA	NA
Total		6.8	12	0.54	13	NA	NA

Table 2.7-9. Building 830-Source (830-SRC) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
830-SRC	January	0	0	0	0	NA	NA
	February	0	88	0.25	12	NA	NA
	March	280	97	0.19	13	NA	NA
	April	52	88	0.14	12	NA	NA
	May	65	110	0.17	14	NA	NA
	June	51	110	0.16	12	NA	NA
Total		450	490	0.90	62	NA	NA

Table 2.7-10. Building 830-Distal South (830-DISS) mass removed, January 1, 2016 through June 30, 2016.

Treatment facility	Month	SVTS VOC mass removed (g)	GWTS VOC mass removed (g)	Perchlorate mass removed (g)	Nitrate mass removed (kg)	RDX mass removed (g)	TBOS/TKEBS mass removed (g)
830-DISS	January	NA	0	0	0	NA	NA
	February	NA	0	0	0	NA	NA
	March	NA	0	0	0	NA	NA
	April	NA	2.6	0.61	21	NA	NA
	May	NA	1.4	0.30	12	NA	NA
	June	NA	2.1	0.42	21	NA	NA
Total		NA	6.1	1.3	55	NA	NA

Table 2.8-1. Building 801 and Pit 8 Landfill area ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K8-01	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
K8-01	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K8-01	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
K8-01	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K8-01	PTMW	Tnbs1-Tnbs0	S	CMP	E624MOD:ALL	2	Y	
K8-01	PTMW	Tnbs1-Tnbs0	S	CMP	E624MOD:ALL	4		
K8-01	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K8-01	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	4		
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	4		
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	1	Y	
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	3		
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	4		
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	1	Y	
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	3		
K8-02B	DMW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	4		
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
K8-02B	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K8-03B	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
K8-03B	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K8-03B	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
K8-03B	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K8-03B	PTMW	Tnbs1-Tnbs0	S	CMP	E624MOD:ALL	2	Y	
K8-03B	PTMW	Tnbs1-Tnbs0	S	CMP	E624MOD:ALL	4		
K8-03B	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K8-03B	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
K8-04	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	ANIONS:FL	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	AS:UIISO	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	E200.7:LI	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	E300.0:NO3	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	E300.0:PERC	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	E624MOD:ALL	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	E8330LOW:ALL	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	E906:ALL	2	N	To be sampled in 2017.
K8-05	DMW	Tnbs1-Tnbs0	O	CMP	T26METALS:ALL	2	N	To be sampled in 2017.
W-PIT8-3201	EW	Tnbs1/Tnbs0	1	UK	E300.0:PERC	3		
W-PIT8-3201	EW	Tnbs1/Tnbs0	1	UK	E8330LOW:ALL	3		
W-PIT8-3201	EW	Tnbs1/Tnbs0	1	UK	E906:ALL	3		
W-PIT8-3201	EW	Tnbs1/Tnbs0	1	UK	MS:UIISO	3		

Table 2.8-2. Building 833 area ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-833-03	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-833-12	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	Insufficient water.
W-833-18	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-833-22	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-833-28	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-833-30	PTMW	LTnbs1	S	CMP	E624MOD:ALL	1	Y	
W-833-30	PTMW	LTnbs1	S	CMP	E624MOD:ALL	3		
W-833-33	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	Y	
W-833-34	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-833-43	PTMW	Tpsg	A	CMP	E624MOD:ALL	1	N	DRY.
W-840-01	PTMW	LTnbs1	A	CMP	E300.0:NO3	1	Y	
W-840-01	PTMW	LTnbs1	A	CMP	E300.0:PERC	1	Y	
W-840-01	PTMW	LTnbs1	A	CMP	E624MOD:ALL	1	Y	
W-840-01	PTMW	LTnbs1	Q	DIS	GENMIN:ALL	2	Y	
W-841-01	PTMW	UTnbs1	O	CMP	E300.0:NO3	1	N	To be sampled in 2017.
W-841-01	PTMW	UTnbs1	O	CMP	E300.0:PERC	1	N	To be sampled in 2017.
W-841-01	PTMW	UTnbs1	A	CMP	E624MOD:ALL	1	Y	

Table 2.8-3. Building 845 Firing Table and Pit 9 Landfill area ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	ANIONS:FL	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	E200.7:LI	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:PERC	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	E906:ALL	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	MS:UIISO	2	Y	
K9-01	DMW	Tnbs1/Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	ANIONS:FL	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	E200.7:LI	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:PERC	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	E906:ALL	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	MS:UIISO	2	Y	
K9-02	DMW	Tnbs1/Tnbs0	A	CMP	T26METALS:ALL	2	Y	
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	ANIONS:FL	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	E200.7:LI	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:PERC	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	E624MOD:ALL	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	E8330LOW:ALL	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	E906:ALL	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	MS:UIISO	2	N	Inoperable equipment.
K9-03	DMW	Tnbs1/Tnbs0	A	CMP	T26METALS:ALL	2	N	Inoperable equipment.
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	ANIONS:FL	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	E200.7:LI	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:NO3	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	E300.0:PERC	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	E906:ALL	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	MS:UIISO	2	Y	
K9-04	DMW	Tnbs1/Tnbs0	A	CMP	T26METALS:ALL	2	Y	

Table 2.8-4. Building 851 area ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-851-05	PTMW	Tmss	A	CMP	AS:UISO	4		To be sampled in 2017.
W-851-05	PTMW	Tmss	O	CMP	E624MOD:ALL	2	N	
W-851-05	PTMW	Tmss	A	CMP	MS:UISO	2	Y	
W-851-06	PTMW	Tmss	A	CMP	AS:UISO	4		
W-851-06	PTMW	Tmss	A	CMP	MS:UISO	2	Y	
W-851-07	PTMW	Tmss	A	CMP	AS:UISO	4		
W-851-07	PTMW	Tmss	A	CMP	MS:UISO	2	Y	
W-851-08	PTMW	Tmss	A	CMP	AS:UISO	4		
W-851-08	PTMW	Tmss	A	CMP	MS:UISO	2	Y	

Table 3.1-1. Pit 2 Landfill area ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
K2-01C	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
NC2-08	DMW	Tnbs1-Tnbs0	A	DIS	MS:UIISO	2	Y	
NC2-08	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
W-PIT2-1934	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	ANIONS:FL	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	E200.7:LI	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	E624MOD:ALL	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	E8330LOW:ALL	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	MS:UIISO	2	Y	
W-PIT2-1935	DMW	Tnbs1-Tnbs0	A	CMP	T26METALS:ALL	2	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	2	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	S	CMP	AS:UIISO	4		
W-PIT2-2226	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	2	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	S	CMP	E300.0:NO3	4		
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	1	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	2	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	3		
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E300.0:PERC	4		
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	1	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	2	Y	
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	3		
W-PIT2-2226	GW	Tnbs1-Tnbs0	Q	CMP	E906:ALL	4		
W-PIT2-2301	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT2-2301	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
W-PIT2-2301	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
W-PIT2-2301	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-PIT2-2301	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT2-2301	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
W-PIT2-2302	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	Y	
W-PIT2-2302	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	Y	
W-PIT2-2302	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
W-PIT2-2302	PTMW	Qal/WBR	S	CMP	E906:ALL	2	Y	
W-PIT2-2302	PTMW	Qal/WBR	S	CMP	E906:ALL	4		

Table 3.1-1. Pit 2 Landfill area ground water sampling and analysis plan.

Sample Location	Location Type	Hydro Unit	Sampling Frequency	Sample Driver	Requested Analysis	Sampling Quarter	Sampled Y/N	Comment
W-PIT2-2302	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	Y	
W-PIT2-2303	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT2-2303	PTMW	Qal/WBR	S	CMP	E300.0:PERC	2	N	DRY.
W-PIT2-2303	PTMW	Qal/WBR	S	CMP	E300.0:PERC	4		
W-PIT2-2303	PTMW	Qal/WBR	S	CMP	E906:ALL	2	N	DRY.
W-PIT2-2303	PTMW	Qal/WBR	S	CMP	E906:ALL	4		
W-PIT2-2303	PTMW	Qal/WBR	A	CMP	MS:UIISO	2	N	DRY.
W-PIT2-2304	PTMW	Tnbs1-Tnbs0	A	CMP	AS:UIISO	2	N	DRY.
W-PIT2-2304	PTMW	Tnbs1-Tnbs0	A	CMP	E300.0:NO3	2	N	DRY.
W-PIT2-2304	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	2	N	DRY.
W-PIT2-2304	PTMW	Tnbs1-Tnbs0	S	CMP	E300.0:PERC	4		
W-PIT2-2304	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	2	N	DRY.
W-PIT2-2304	PTMW	Tnbs1-Tnbs0	S	CMP	E906:ALL	4		

Appendix A
Results of Influent and Effluent pH Monitoring

Appendix A

Results of Influent and Effluent pH Monitoring

Table A-1. Results of influent and effluent pH, January through June 2016.

A-1. Results of influent and effluent pH, January through June 2016.

Sample Location	Sample Date	Effluent pH Result
<i>GSA OU</i>		
CGSA GWTS	01/31/2016	NM
CGSA GWTS	02/28/2016	NM
CGSA GWTS	03/31/2016	NM
CGSA GWTS	04/05/2016	7.2
CGSA GWTS	05/03/2016	7.0
CGSA GWTS	06/06/2016	7.2
<i>Building 834 OU</i>		
834 GWTS	01/31/2016	NM
834 GWTS	02/16/2016	8.0
834 GWTS	03/01/2016	7.5
834 GWTS	04/04/2016	7.5
834 GWTS	05/02/2016	7.8
834 GWTS	06/06/2016	7.5
<i>HEPA OU</i>		
815-SRC GWTS	01/31/2016	NM
815-SRC GWTS	02/10/2016	7.0
815-SRC GWTS	03/01/2016	7.0
815-SRC GWTS	04/04/2016	7.0
815-SRC GWTS	05/03/2016	7.0
815-SRC GWTS	06/06/2016	7.0
815-PRX GWTS	01/31/2016	NM
815-PRX GWTS	02/28/2016	NM
815-PRX GWTS	03/31/2016	NM
815-PRX GWTS	04/30/2016	NM
815-PRX GWTS	05/03/2016	7.5
815-PRX GWTS	06/01/2016	7.5
815-DSB GWTS	01/11/2016	7.0
815-DSB GWTS	02/03/2016	7.0

A-1. Results of influent and effluent pH, January through June 2016.

Sample Location	Sample Date	Effluent pH Result
815-DSB GWTS	03/01/2016	7.0
815-DSB GWTS	04/05/2016	7.0
815-DSB GWTS	05/03/2016	7.0
815-DSB GWTS	06/06/2016	7.0
817-SRC GWTS	01/31/2016	NM
817-SRC GWTS	02/28/2016	NM
817-SRC GWTS	03/31/2016	NM
817-SRC GWTS	04/30/2016	NM
817-SRC GWTS	05/31/2016	NM
817-SRC GWTS	06/14/2016	7.0
817-PRX GWTS	01/31/2016	NM
817-PRX GWTS	02/16/2016	7.0
817-PRX GWTS	03/09/2016	7.0
817-PRX GWTS	04/04/2016	7.0
817-PRX GWTS	05/11/2016	7.0
817-PRX GWTS	06/13/2016	7.0
829-SRC GWTS	01/31/2016	NM
829-SRC GWTS	02/16/2016	7.5
829-SRC GWTS	03/31/2016	NM
829-SRC GWTS	04/11/2016	7.5
829-SRC GWTS	05/31/2016	NM
829-SRC GWTS	06/30/2016	NM
<i>Building 850/Pit 7 Complex OU</i>		
PIT7-SRC GWTS	01/11/2016	7.0
PIT7-SRC GWTS	02/03/2016	7.0
PIT7-SRC GWTS	03/01/2016	7.0
PIT7-SRC GWTS	04/05/2016	7.0
PIT7-SRC GWTS	05/03/2016	7.0
PIT7-SRC GWTS	06/06/2016	7.0

A-1. Results of influent and effluent pH, January through June 2016.

Sample Location	Sample Date	Effluent pH Result
<i>Building 854 OU</i>		
854-SRC GWTS	01/31/2016	NM
854-SRC GWTS	02/28/2016	NM
854-SRC GWTS	03/31/2016	NM
854-SRC GWTS	04/30/2016	NM
854-SRC GWTS	05/31/2016	NM
854-SRC GWTS	06/30/2016	NM
854-PRX GWTS	01/31/2016	NM
854-PRX GWTS	02/28/2016	NM
854-PRX GWTS	03/31/2016	NM
854-PRX GWTS	04/06/2016	7.0
854-PRX GWTS	05/01/2016	7.0
854-PRX GWTS	06/06/2016	7.5
854-DIS GWTS	01/31/2016	NM
854-DIS GWTS	02/28/2016	NM
854-DIS GWTS	03/31/2016	NM
854-DIS GWTS	04/30/2016	NM
854-DIS GWTS	05/25/2016	7.0
854-DIS GWTS	06/06/2016	7.0
<i>832 Canyon OU</i>		
832-SRC GWTS	01/31/2016	NM
832-SRC GWTS	02/16/2016	7.5
832-SRC GWTS	03/01/2016	7.5
832-SRC GWTS	04/04/2016	7.5
832-SRC GWTS	05/02/2016	7.5
832-SRC GWTS	06/20/2016	7.5
830-SRC GWTS	01/31/2016	NM
830-SRC GWTS	02/16/2016	7.5
830-SRC GWTS	03/01/2016	7.5

A-1. Results of influent and effluent pH, January through June 2016.

Sample Location	Sample Date	Effluent pH
		Result
830-SRC GWTS	04/04/2016	7.5
830-SRC GWTS	05/02/2016	7.5
830-SRC GWTS	06/06/2016	7.5
830-DISS GWTS	01/31/2016	NM
830-DISS GWTS	02/28/2016	NM
830-DISS GWTS	03/31/2016	NM
830-DISS GWTS	04/06/2016	7.0
830-DISS GWTS	05/03/2016	7.0
830-DISS GWTS	06/06/2016	7.0

Notes:

834 = Building 834.
 815 = Building 815.
 817 = Building 817.
 829 = Building 829.
 854 = Building 854.
 832 = Building 832.
 830 = Building 830.
 CGSA = Central General Services Area.
 EGSA = Eastern General Services Area.
 DISS = Distal south.
 DSB = Distal site boundary.
 GWTS = Ground water treatment system.
 PRX = Proximal.
 PRXN = Proximal North.
 SRC = Source.
 NA = Not applicable.
 NM = Not measured due to facility not operating during this period.
 NR = Not required.
 OU = Operable unit.
 pH = A measure of the acidity or alkalinity of an aqueous solution.
 mg/L = Milligrams per liter.



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