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First Semester 2009 Compliance Monitoring Report Lawrence Livermore National Laboratory Site 300

Technical Editors

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September 30, 2009

*Weiss Associates, Emeryville, California

Environmental Restoration Department

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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 2009. The report is submitted in compliance with the Compliance Monitoring Plan (CMP)/Contingency Plan for Interim Remedies at Lawrence Livermore National Laboratory Site 300 (Ferry et al., 2002). As agreed to with the Regional Water Quality Control Board (RWQCB), the Central and Eastern General Services Area (GSA) monitoring data, which were collected in compliance with the GSA CMP (Rueth, 1998) and Eastern GSA post-shutdown monitoring requirements (Holtzapple, 2007) are also included in this report.

During the reporting period of January through June 2009, 4.3 million gallons of ground water and 47.6 million cubic feet of soil vapor were treated at Site 300, removing approximately 8.2 kilograms (kg) of volatile organic compounds (VOCs), 73 grams (g) of perchlorate, 790 kg of nitrate, 66 g of Research Department Explosive (RDX), and 1 g of a mixture of tetrabutyl orthosilicate (TBOS) and tetrakis (2-ethylbutyl) silane (TKEBS) (Table Summ-1).

Since remediation began in 1991, approximately 371 million gallons of ground water and over 448 million cubic feet of soil vapor have been treated, removing approximately 530 kg of VOCs, 870 g of perchlorate 7,400 kg of nitrate, 1.3 kg of RDX, and 9.5 kg of TBOS/TKEBs (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 Explosive Process Area (HEPA) OU 4

2.5. Building 850 Area of 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, Building 845, Building 851)

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

Total VOC isoconcentration contour maps were constructed by summing the results of the following VOCs: trichloroethene (TCE); tetrachloroethene (PCE); cis-1,2-dichloroethene (cis-1,2-DCE); trans-1,2-dichloroethene (trans-1,2-DCE); carbon tetrachloride; chloroform; 1,1-dichlorethane (1,1-DCA); 1,2-dichlorethane (1,2-DCA); 1,1-dichloroethene (1,1-DCE);

1,1,1-trichloroethane (1,1,1-TCA); trichlorofluoromethane (Freon 11); 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113); 1,1,2-trichloroethane (1,1,2-TCA); and vinyl chloride. The resultant sums were rounded to two significant figures before plotting on the maps.

Only primary contaminants of concern (COC) isoconcentration contour maps are presented in the semi-annual reports. Secondary COC data will be presented in the annual report.

Hydraulic capture zones for all HSUs, and post-only maps and isoconcentration contour maps for the secondary COCs will be presented next semester in the 2009 Annual CMR report. To present a contemporaneous view of ground water elevations and COC plumes, the maps were constructed using the quarterly sampling data set available with the most complete geographic coverage for the 6-month reporting period. For collocated wells, the highest COC concentration was used for contouring. In some cases where multiple samples were collected during the selected quarter, the maximum concentration detected is presented on the COC plume map. In some rare cases, where additional samples were collected during the reporting period but not the selected quarter depicted on the COC plume map, the maximum detection for a particular well may not be shown on the COC plume map. Specific ground water monitoring data are discussed within each OU section of this report and all ground water analytical data are included in the data tables for the annual report.

Treatment facility operations and maintenance issues that occurred during the first semester and influent and effluent analytical data collected during the first semester are included in this report. Treatment facility pH data collected during the first semester are presented in Appendix A. Ground and surface water monitoring analytical data and ground water elevations for the entire calendar year will be presented in the annual report.

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 is an abandoned debris burial trench that received craft shop debris. Leaching of solvents in the debris resulted in the release of contaminants to ground water.

A ground water extraction and treatment system (GWTS) 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-25N01, and W-25N-24), located downgradient from the debris burial trenches, at a combined flow rate of 45 gallons per minute (gpm). The extracted ground water was treated in three 1,000-pound (lb) granular activated carbon units that removed VOCs through adsorption. The treated effluent water was discharged to nearby Corral Hollow Creek.

Remediation efforts in the Eastern GSA have successfully reduced concentrations of TCE and other VOCs in ground water to below their respective 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), RWQCB, and California Department of Toxic Substances Control (DTSC) approval. As required by the GSA ROD, ground water monitoring will be conducted for 5 years after shutdown to determine if VOC concentrations rise or “rebound” above cleanup standards. VOC concentrations remain below their cleanup standards after 2 years and 8 months following shutdown of the treatment facility.

A map of the Eastern GSA, showing the locations of monitoring and extraction wells and the treatment facility is presented in Figure 2.1-1.

At the Central GSA, chlorinated solvents, mainly TCE, were used as degreasing agents in craft shops, such as Building 875. Rinse water from these degreasing operations was disposed of in dry wells. Typically, dry wells were gravel-filled holes about 3 to 4 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 GWTS began operating since 1992 removing VOCs from ground water. Contaminated ground water is extracted from eight wells (W-7I, W-875-07, W-875-08, W-873-07, W-872-02, W-7O, W-7P, and W-7R) at an approximate combined flow rate of approximately 2.0 to 3.0 gpm. The Central GSA GWTS began receiving partially treated water from the Building 830-Distal South (830-DISS) facility at the end of the first semester 2007, increasing the flow rate to approximately 5.0 to 6.0 gpm. The current GWTS 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. Treated vapors are discharged to the atmosphere under permit from the San Joaquin Valley Unified Air Pollution Control District.

The Central GSA soil vapor extraction and treatment system (SVTS) began operation in the GSA adjacent to the Building 875 dry well contaminant source area in 1994 removing VOCs from soil vapor. Four wells (W-875-07, W-875-08, W-7I, and W-875-10) were initially utilized to extract soil vapor at an approximate flow rate of 17.6 standard cubic feet per minute (scfm). Soil vapor extraction from the entire wellfield (W-7I, W-875-07, W-875-08, W-875-09, W-875-10, W-875-11, and W-875-15) was initiated in November 2007 after installation of individual vapor flow meters, increasing the total flow rate to greater than 35 scfm. Simultaneous ground water extraction in the vicinity lowers the elevation of the ground water surface and maximizes the volume of unsaturated soil influenced by vapor extraction. The current SVTS 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 permit from the San Joaquin Valley Unified Air Pollution Control District.

A map of the Central GSA, showing the locations of monitoring and extraction wells and treatment facilities is presented in Figure 2.1-2.

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; receiving water monitoring; compliance summary; and sampling plan evaluation and modifications.

2.1.1.1. GSA Facility Performance Assessment

As discussed above, the Eastern GSA GWTS has been shut down since February 15, 2007. Subsequently, only the Central GSA treatment system data will be presented in this report. The monthly ground water and soil vapor discharge volumes and rates and operational hours 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 is 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 are shown in Tables 2.1-2 and 2.1-3. The pH measurement results are presented in Appendix A.

2.1.1.2. GSA Operations and Maintenance Issues

There were no operations and maintenance issues at the Eastern GSA GWTS since it was shut down on February 15, 2007 because ground water cleanup standards have been achieved (see Section 2.1).

The following maintenance and operational issues interrupted continuous operations of the Central GSA GWTS and SVTS during the first semester:

- Extraction wells W-7P and W-7R were shutdown from December 7 to January 21 to protect against freeze damage.
- The SVTS was shutdown December 10 to protect against freeze damage and was restarted on January 27 after maintenance was performed on extraction well W-875-15 to retrieve a water level probe stuck in the well and on extraction well W-875-08 to resolve a valve issue.
- The GWTS and SVTS were shut down on February 12 due to problems with the discharge pump to the misting towers. The discharge pump was replaced on February 18 and the systems were restarted. The treatment systems were shut down February 19 because the air-stripping unit alarm was tripping frequently. In addition, the pipeline from the ground water treatment system to the discharge misting towers had become disconnected and was re-glued. The treatment systems were restarted on February 24 after repairing the pipe to the misting towers, however, the repair did not hold due to the stress on the joint and the treatment systems were shut down on February 25. Pipe supports were installed and the treatment systems were restarted on March 2.

2.1.1.3. GSA Compliance Summary

The Central GSA GWTS operated in compliance with the Substantive Requirements for Wastewater Discharge during the first semester 2009. However, as shown in Table 2.1-2, VOCs were not detected in either the routine and duplicate influent samples collected in April. The results were investigated, but an explanation for the absence of VOCs was not determined. These data have been flagged as suspect. The Central GSA SVTS system operated in compliance with the San Joaquin Valley Unified 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 Substantive Requirements and the GSA CMP (Rueth, 1998) monitoring requirements. The treatment facility sampling and analysis plan is presented in Table 2.1-4. 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 CGSA GWTS, SVTS, or the extraction wellfield during this reporting period.

2.1.2. GSA Surface Water and Ground Water Monitoring

The sampling and analysis plans for ground water monitoring at the Central and Eastern GSA are presented in Tables 2.1-5 and 2.1-6, respectively. These tables also delineate and explain deviations from the sampling plan and indicate any additions made to the CMP.

During the reporting period, ground water monitoring was conducted in accordance with the Central GSA CMP and Eastern GSA post-shutdown monitoring requirements with the following exceptions; eight required analyses was not performed due to a pump failure and twelve required analyses were not performed because there was insufficient water in the wells to collect the samples.

Ground water elevation contours and hydraulic capture zones for the extraction wells that were active during first semester for the Eastern and Central GSA are presented in Figures 2.1-3 and 2.1-4, respectively.

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 are summarized in Table 2.1-7. The total mass removed during this 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 GSA OU, VOCs are the primary COCs detected in ground water. VOCs are present at very low concentrations in ground water within Quaternary alluvial deposits (Qal) that directly overlie the $Tnbs_1$ bedrock in the Eastern GSA. A total VOC isoconcentration contour map based on data collected during the first semester of 2009 for this shallow Qal-$Tnbs_1$ hydrostratigraphic unit (HSU) is presented on Figure 2.1.5. Within the Qal-$Tnbs_1$ HSU, total VOC concentrations detected in samples during the first semester of 2009 ranged from 8.4 µg/L (W-26R-01, May 2009) to <0.5 µg/L. VOCs were not detected in ground water samples from wells in the deeper $Tnbs_1$ HSU during the first semester of 2009.

Since extraction and treatment began at the Eastern GSA in 1991, TCE concentrations in ground water decreased from a historic maximum of 74 micrograms per liter (µg/L) (W-26R-03, January 1992) to below analytical reporting limits (0.5 µg/L) in the majority of wells. Additionally, TCE concentrations in ground water have decreased to below the 5 µg/L cleanup standard for TCE in all wells, with the exception of one detection above 5 µg/L during the first semester of 2009 (6.9 µg/L in well W-26R-01 in May 2009). Well W-26R-01 and nearby well W-26R-04 were re-sampled for VOCs in June 2009. During the re-sample event, four ground water samples were collected from each well; two collected after low flow purging and two after purging three casing volumes. For each purge method, the two samples were submitted to different analytical laboratories. TCE concentrations did not exceed 5 µg/L in any of the eight ground water samples collected during the June re-sampling event. These results were discussed with the U.S. EPA, DTSC, and RWQCB at the July 8, 2009 Remedial Project Manager's

Meeting. The regulatory agencies concurred with continued monitoring and evaluation of TCE concentrations in Eastern GSA wells to determine if TCE concentrations are rebounding.

VOCs are the only COCs in ground water and soil vapor at the Central GSA. There are three primary HSUs in the Central GSA:

- Qt-$Tnsc_1$ HSU, a shallow water-bearing zone in the western portion of the Central GSA. This HSU includes saturated Qt deposits, and the $Tnbs_2$ sandstone and $Tnsc_1$ siltstone/claystone bedrock units that subcrop beneath the Qt.
- $Tnbs_1$ HSU, a deeper regional aquifer within the western portion of the Central GSA which consists of $Tnbs_1$ sandstone bedrock.
- Qal-$Tnbs_1$ HSU, a shallow water-bearing zone within the eastern portion of the Central GSA. In the eastern portion of the Central GSA (near the sewage treatment pond), Qt deposits and the $Tnbs_2$ and $Tnsc_1$ bedrock units are not present. Qal deposits directly overlie the shallow $Tnbs_1$ bedrock that comprises the Qal-$Tnbs_1$ HSU in this area.

A VOC plume exists within the Qt-$Tnsc_1$ and Qal-$Tnbs_1$ HSUs in the Central GSA. A total VOC isoconcentration contour map based on data collected during the first semester of 2009 for these HSUs is presented on Figure 2.1.6.

Within the Qt-$Tnsc_1$ and Qal-$Tnbs_1$ HSUs, total VOC concentrations during the first semester of 2009 ranged from a maximum of 350 µg/L (W-875-08, April 2009) to <0.5 µg/L. The maximum total VOC ground water concentration continues to be located in the dry well pad area. During the first semester of 2009, total VOCs were detected in offsite monitoring wells W-35A-01, W-35A-09, and W-35A-10 at concentrations of 1.3, 2.6, and 27 µg/L, respectively. Prior to remediation, the maximum total VOC concentration detected in Central GSA ground water was 272,000 µg/L (W-875-07, 1992), compared to the first semester 2009 concentration of 190 µg/L in the same well. This decline in VOCs demonstrates the efficacy of ongoing cleanup operations.

A TCE soil vapor concentration contour map is presented on Figure 2.1-7 and depicts the extent of TCE vapor in April 2009. The extent of the vapor plume is similar to that depicted during the second semester of 2008, however, the magnitude decreased slightly. The maximum TCE vapor concentrations in the second semester 2008 and the first semester 2009 were 9.4 $ppm_{v/v}$ and 4.1 $ppm_{v/v}$, respectively. The maximum historic TCE vapor concentration is 531 $ppm_{v/v}$ (W-875-07, November 1999) collected at the end of a one-week long rebound test.

2.1.3.3. GSA Remediation Optimization Evaluation

By 2007, ground water extraction and treatment had reduced VOC concentrations in all Eastern GSA wells to below the GSA ROD ground water cleanup standards and TCE concentrations to below analytical reporting limits (0.5 µg/L) in the majority of wells. In January of 2007, DOE/LLNL proposed to initiate the “Requirements for Closeout” described in the Remedial Design document for the GSA OU (Rueth et al., 1998). These requirements specify: *when VOC concentrations in ground water have been reduced to cleanup standards, the ground water extraction and treatment system will be shut off and placed on standby*. The U.S. EPA, RWQCB, and DTSC approved this proposal and the Eastern GSA ground water extraction and treatment system was turned off and effluent discharge to Corral Hollow Creek was discontinued on February 15, 2007, thereby meeting the Substantive Requirements. As required by the GSA ROD, ground water monitoring is being conducted to determine if VOC concentrations rebound above cleanup standards. As of the end of the first semester of 2009, VOCs (TCE) have been detected only once above cleanup standards (6.9 µg/L in well W-26R-01 in May 2009). As described in subsection 2.1.3.2 above, this well and nearby well W-26R-04 were re-sampled in June 2009 with no TCE detections above the cleanup standard. In the Eastern GSA Compliance Feasibility Report submitted to regulatory agencies on July 15, 2007, DOE/LLNL evaluated onsite discharge options that could be implemented if VOC concentrations rebound above cleanup standards requiring that the Eastern GSA extraction and treatment system be restarted. At this point, monitoring of Eastern GSA wells will continue as described in the post shutdown monitoring plan.

At the Central GSA, ground water extraction continues to adequately capture the highest VOC concentrations in ground water. During the first semester of 2009, extraction wells W-7O and W-7R removed the majority of the ground water while wells W-875-08 and W-7O removed most of the dissolved VOC mass.

Significantly more VOC mass is being removed by soil vapor extraction than by ground water extraction. During the first semester of 2009, 0.12 kg of VOCs were removed from ground water, whereas 0.74 kg of VOCs were removed from vapor. Based on individual well vapor flow monitoring for the first semester of 2009, SVE wells W-875-07, W-875-09, W-875-10, W-875-11, and W-875-15 removed most of the vapor mass. The SVE wellfield configuration will continue to be monitored and evaluated. Changes to the SVE well configuration will be made as part of ongoing optimization activities.

2.1.3.4. GSA OU Remedy Performance Issues

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, piping leaks, and septic system leachate at the Building 834 Complex have resulted in soil and ground water contamination with VOCs, TBOS/TKEBs, and nitrate. In addition, a former underground diesel storage tank released diesel to the subsurface. A map of Building 834 OU showing the locations of monitoring and extraction wells and treatment facilities is presented in Figure 2.2-1.

The Building 834 GWTS and SVTS began operation in 1995 and 1998, respectively. These systems are located in the main part of the Building 834 Complex, referred to as the Building 834 core area. The GWTS removes VOCs and TBOS/TKEBs from ground water within the Tpsg HSU and the SVTS removes VOCs from soil vapor. The area immediately to the southwest of the core area is the leachfield area and further to the south is the distal (T2) area. Due to the very low ground water yield from individual ground water extraction wells (<0.1 gpm), the GWTS and SVTS have been operated simultaneously in batch mode. Although the GWTS can be operated alone, the SVTS is not operational without ground water extraction due to the upconing of the ground water in the well that covers the well screen and prevents soil vapor flow.

The current extraction wellfield consists of 13 extraction wells for both ground water and soil vapor extraction. Ten extraction wells (W-834-B2, -B3, -D4, -D5, -D6, -D7, -D12, -D13, -J1, and -2001) are located within the core area and three (W-834-S1, -S12A, and -S13) in the leachfield area. Extraction well W-834-D5 is connected to the facility but has not been used for extraction since the facility was restarted in October 2004 because the capture area is similar to the capture area of extraction well W-834-D13. Ground water and soil vapor extraction well W-834-2001 was added to the system in March 2007. Extracted ground water from this well contains dissolved-phase diesel related to the former underground diesel storage tank. The GWTS extracts ground water at an approximate combined flow rate of 0.23 gpm and the SVTS extracts soil vapor at a combined flow rate of approximately 103 scfm. The current GWTS configuration includes floating hydrocarbon adsorption devices to remove the floating silicon oil, TBOS/TKEBs, and any floating diesel, followed by aqueous-phase GAC to remove VOCs, dissolved-phase TBOS/TKEBs, and diesel from ground water. Nitrate-bearing treated effluent is then discharged via a misting tower for atomization and onto the landscape for uptake and utilization of the nitrate by indigenous grasses. The current SVTS configuration includes vapor-phase GAC for VOC removal. Treated vapors are discharged to the atmosphere under an air permit from the San Joaquin Valley Unified Air Pollution Control District.

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 are summarized in Table 2.2-1. The total volume of ground water and vapor extracted and treated and masses removed during the reporting period is 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 are shown in Tables 2.2-2 through 2.2-5. 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 GWTS and SVTS during second semester:

- The GWTS and SVTS were shut down from December 9, 2008 to January 12 to prevent freeze damage.
- The facility blower shut down temporarily from April 7 to April 8.

2.2.1.3. Building 834 OU Compliance Summary

The Building 834 GWTS operated in compliance with the Substantive Requirements for Wastewater Discharge. The Building 834 SVTS operated in compliance with the San Joaquin Valley Unified Air Pollution Control District permit limitations.

2.2.1.4. Building 834 OU Facility Sampling Plan Evaluation and Modifications

The Building 834 treatment facility sampling and analysis plan complies with CMP monitoring requirements. The sampling and analysis plan is presented in Table 2.2-6. There were no modifications made to the plan during the 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 occurred 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 2.2-7. This table also delineates and explains deviations from the sampling plan and indicates any additions made to the CMP.

During this reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions; eighty-eight required analyses were not performed because there was insufficient water in the wells to collect the samples.

Ground water elevation contours for the Tpsg HSU are presented in Figure 2.2-2. Ground water elevations for the Tps-$Tnsc_2$ HSU are posted in Figure 2.2-3.

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 are summarized in Table 2.2-8. The total mass removed during this 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 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-$Tnsc_2$ perching horizon.

Total VOC concentration data are contoured for the Tpsg HSU and posted for the Tps-$Tnsc_2$ HSU based on data collected during the first semester of 2009 and are presented on Figures 2.2-4 and 2.2-5, respectively. Isoconcentration contour maps for the secondary COCs will be presented next semester in the 2009 Annual CMR report.

2.2.3.2.1. Total VOCs Contaminant Concentrations and Distribution

While the overall extent of total VOCs in the Building 834 OU ground water and soil vapor have not changed significantly, the maximum concentrations have decreased by more than an order-of-magnitude since remediation began in the mid 1990s.

The highest VOC concentrations for both vapor and ground water continue to be detected in the 834 core area. Active remediation has reduced total VOC ground water concentrations in the more permeable Tpsg HSU from a pre-remediation maximum of 1,060,000 µg/L (W-834-D3, 1993) to a first semester 2009 maximum concentration of 27,000 µg/L (W-834-D4, April 2009). The underlying Tps-$Tnsc_2$ HSU currently exhibits the highest total VOC ground water concentrations in OU 2 at 150,000 µg/L (W-834-A1, February 2009). Total VOC ground water concentration trends in this HSU have decreased or remained stable since monitoring of this HSU began in 1994. First semester 2009 TCE vapor concentrations from the core area SVE wells ranged from 0.015 to 1.6 $ppm_{v/v.}$ These concentrations have decreased significantly from the maximum pre-remediation core area TCE vapor concentration of 3,200 $ppm_{v/v}$ detected in W-834-D4 in 1989. Well W-834-D4 is located approximately ten feet from well W-834-D3, the well that historically yielded the maximum ground water VOC concentration, as mentioned above.

In the leachfield area, total VOC concentrations in the Tpsg HSU have decreased by an order-of-magnitude, from a pre-remediation maximum of 179,200 µg/L (W-834-S1, 1988) to a first semester 2009 maximum concentration of 8,100 µg/L (W-834-2113, February 2009). The total VOC concentrations in the underlying Tps-$Tnsc_2$ HSU in the leachfield area are significantly lower than Tps-$Tnsc_2$ VOC concentrations in the core area. The first semester 2009 maximum total VOC concentration in the Tps-$Tnsc_2$ HSU ground water was 3,900 µg/L (W-834-S8, February 2009) in the leachfield area. This HSU has exhibited decreasing or stable trends since monitoring began in 1989. First semester 2009 TCE vapor concentrations from the Tpsg HSU in the leachfield area ranged from 0.6 to 9.2 $ppm_{v/v}$. These concentrations are significantly lower than the maximum pre-remediation leachfield area TCE vapor concentration of 710 $ppm_{v/v}$ measured in 2004.

In the distal area, total VOC concentrations in the Tpsg HSU have decreased from a historic maximum of 86,000 µg/L (W-834-T2A, 1988) to a first semester 2009 maximum concentration of 13,000 µg/L (W-834-2117, February 2009). The underlying Tps-$Tnsc_2$ HSU is monitored by one well, W-834-2119. The total VOC concentration in this well was 14,000 µg/L measured during the first semester of 2009. Historic total VOC concentrations in this well have not changed significantly. This well continues to be closely monitored because it is located near an ongoing *in situ* bioremediation experiment. *In situ* bioremediation is being evaluated for this area as part of a long-term treatability test and the current status is described in Section 2.2.3.4. The total VOC concentrations in the area impacted by the bioremediation experiment have decreased significantly due to a combination of *in situ* biodegradation and dilution.

TCE biodegradation continues within the core area where significant amounts of TBOS are present and serve as an electron donor for intrinsic *in situ* biodegradation. Historically, the primary byproduct of this biodegradation has been cis-1,2-DCE, although limited vinyl chloride has also been detected. Both cis-1,2-DCE and vinyl chloride were detected in core area ground water in first semester 2009. Low concentrations of the electron donor TBOS and the breakdown product cis-1,2-DCE have been periodically measured indicating that some limited intrinsic biodegradation may also be taking place in this area.

Total VOC concentrations and its extent in ground water are expected to continue to decrease over time as remediation progresses. The deep regional $Tnbs_1$ aquifer continues to be free of contaminants as demonstrated by the absence of VOC detections above the reporting limit

(0.5 µg/L) in $Tnbs_1$ guard wells W-834-T1 and W-834-T3 that are monitored on a quarterly basis.

2.2.3.2.2. TBOS/TKEBS Contaminant Concentrations and Distribution

The maximum TBOS/TKEBS ground water concentration has decreased from a historic maximum of 7,300,000 µg/L (W-834-D3, 1995) to 270,000 µg/L (W-834-D3, February 2009). This compound is found exclusively in the core area. Wells with historic concentrations of TBOS/TKEBS vary from one sampling event to the next, likely due to varying amounts of free-phase TBOS/TKEBS in the sample. TBOS/TKEBS concentrations in Tpsg HSU wells in the leachfield and distal areas continue to be below reporting limits during the first semester 2009.

Both the concentrations and extent of TBOS/TKEBS in ground water are greater in the Tpsg HSU than in the underlying Tps-$Tnsc_2$ HSU perched horizon. During the first semester of 2009, TBOS/TKEBS was detected in only one Tps-$Tnsc_2$ HSU well at a concentration of 110 µg/L (W-834-U1, February 2009). TBOS/TKEBS continues to remain below reporting limits in guard wells W-834-T1 and W-834-T3.

2.2.3.2.3. Nitrate Contaminant Concentrations and Distribution

During the first semester of 2009, nitrate was detected in ground water at concentrations exceeding the 45 mg/L cleanup standard in the Building 834 core, leachfield, and distal areas in the Tpsg and Tps-$Tnsc_2$ HSUs. Nitrate concentrations in Tpsg HSU ground water ranged from a maximum of 310 mg/L (W-834-S7, February 2009) to below the 0.5 mg/L reporting limit. In the core area, nitrate concentrations in the Tpsg HSU vary spatially and temporally related to denitrification associated with ongoing intrinsic in situ biodegradation. In the underlying Tps-$Tnsc_2$ HSU, nitrate concentrations ranged from a maximum of 93 mg/L (W-834-1711, January 2009) to 2.4 mg/L (W-834-A1, February 2009).

A combination of both natural and anthropogenic (e.g., septic) sources contribute to the nitrate in Building 834 OU ground water. While nitrate concentrations have decreased from a historic maximum of 749 mg/L (W-834-K1A, 2000), the continued elevated nitrate concentrations indicate an ongoing source of ground water nitrate. The primary source of nitrate is most likely the septic system leachfield. Additional natural sources in the Tpsg and underlying Tps-$Tnsc_2$ may also contribute nitrate.

Nitrate was detected in $Tnbs_1$ HSU guard well W-834-T1 during the first semester 2009 at a concentration of 0.89 mg/L (February 2009). Historically, nitrate has been detected in this well on two previous occasions (0.45 mg/L in January 2004 and 3.8 mg/L in November 1997). Nitrate was not detected in $Tnbs_1$ HSU guard well W-834-T3 during the first semester 2009.

2.2.3.2.4. Other Contaminant Concentrations and Distribution

The extent of diesel in ground water is limited to the area near a former underground storage tank located beneath the paved portion of the core area. During the first semester of 2009, diesel was detected in well W-834-2001 at a concentration of 1,200 µg/L (January 2009).

Benzene, toluene, ethylbenzene, and xylenes (BTEX) monitoring was conducted in ten Building 834 OU wells during the first semester of 2009. No BTEX compounds were detected in these wells. However, BTEX have been historically detected in as many as ten wells; these concentrations are likely related to the former underground storage tank. BTEX analytical data will continue to be evaluated to support a reduction in monitoring.

During the first semester 2009, samples were collected from two wells (W-834-S7 and W-834-2118) to monitor perchlorate. Perchlorate was detected in ground water from only well W-834-S7 at a concentration of 11 µg/L (February 2009). Ground water monitoring for perchlorate will continue semi-annually for these two wells. The origin of perchlorate in this area is unknown.

2.2.3.3. Building 834 OU Remediation Optimization Evaluation

Dual-phase extraction and treatment continued throughout the first semester of 2009 with the exceptions discussed in Section 2.2.1.2. During the first semester of 2009, no modifications were made to the extraction wellfields for either the core or the leachfield areas and the wellfields continue to adequately capture the highest concentrations in ground water.

Significantly more VOC mass is being removed by soil vapor extraction than by ground water extraction. During the first semester of 2009, 0.81 kg of VOCs were removed from ground water in the Building 834 OU, whereas 4.93 kg of VOCs were removed from vapor. The preponderance of VOC ground water mass was removed from the core area (80% or 0.65 kg), whereas the majority of vapor mass was removed from the leachfield area (68.5% or 3.38 kg).

The total VOC trends in the underlying Tps-$Tnsc_2$ HSU will continue to be monitored closely to evaluate beneficial impacts from active remediation of the overlying Tpsg HSU and injection operations associated with enhanced *in situ* bioremediation activities. Conventional pump and treat methods in this low permeability, limited recharge HSU are not expected to be effective in reducing VOC concentrations to meet cleanup standards. The use and feasibility of enhanced *in situ* remediation techniques, such as reagent injection and bio-augmentation, are still under consideration to remediate this HSU.

2.2.3.4 T2 Treatability Study

The T2 treatability study, which began in 2005, continued during 2009. One of the primary objectives of this study is to assess the performance of passive *in situ* bioremediation of TCE at concentrations greater than 10 mg/L in a low yield water-bearing zone (Tpsg HSU) that is typical of VOC source areas at Site 300. The technology is considered passive because it relies solely on injection of nutrients and bacteria without the aid of any active extraction wells. In this treatability study, an isotopically distinct conservative tracer, Hetch-Hetchy (H-H) water, and light hydrocarbon (LHC) analysis of TCE breakdown products, such as ethene, are being used to distinguish bacterial dechlorination of TCE from hydraulic displacement and dilution of the plume resulting from reagent injection. During this phase of the study, Tpsg ground water was bioaugmented with a consortium of dechlorinating bacteria (KB-1) that contain a strain of Dehalococoides capable of complete dechlorination of TCE to ethene.

As reported in the 2008 Annual CMR, the injection of H-H water into Tpsg well W-834-1824 along with additions of electron donor, sodium lactate (Na Lactate), was discontinued in late December 2008. A total of approximately 2,800 gallons of H-H water and 200 gallons of Na Lactate were injected. Well W-834-1825 was bioaugmented on August 5, 2008 by injecting a 10-liter slurry containing KB-1 after suitable reducing conditions had been achieved.

During this reporting period, ground water levels increased slightly in all wells except the Na lactate/tracer injection well, W-834-1824, which has been declining since injection was discontinued. Redox conditions remained highly reducing in performance monitor wells

(W-834-T2 and W-834-1825) and reached reducing conditions in a third well (W-834-1833) midway through the period (Table B-2). In terms of total VOC concentrations, two of the five performance monitoring wells (W-834-T2 and W-834-1825) had already declined significantly by the end of 2008 while the other three performance monitoring wells (W-834-1833, W-834-T2A and W-834-T2D) exhibited little to no change. This trend continued during the first semester 2009, however, only the bioaugmentation well showed some continued, although limited, drop in total VOC concentrations. The decline in total VOC concentrations is likely due to a combination of VOC destruction due to bacterial dechlorination and dilution and displacement by H-H water injection. Evidence of complete dechlorination of TCE to ethene continued to be observed in well W-834-T2 and bioaugmentation well W-834-1825 during this reporting period. Unexpectedly, the amount of ethene generation in W-834-T2 was an order-of-magnitude higher than in the bioaugmentation well. For example, W-834-1825 contained 180 µg/L of ethene by May 2009; while W-834-T2 contained 1,300 µg/L. These results were not anticipated because W-834-T2 is hydraulically upgradient of bioaugmentation well W-834-1825. There are at least two possible explanations for these observations: (1) a hydraulic connection exists between bioaugmentation well W-834-1824 and W-834-T2 via a preferential pathway and KB-1 bacteria injected into well W-834-1825 in August migrated "upgradient" to well W-834-T2 by November 2008; or (2) a complete dechlorination of TCE was achieved at well W-834-T2 by indigenous bacteria and electron donor addition. The second scenario was not supported by the microcosm study that indicated electron donor alone could not lead to complete dechlorination.

One of the potential water quality impacts of this *in situ* technology is methane production and metals dissolution in the treatment zone. For example, by May 2009, methane in groundwater increased to (1) 8,300 µg/L in well W-834-T2 and (2) 10,000 µg/L in well W-834-1825 (Appendix B). However, the methane production appears to be localized to the treatment zone in the immediate vicinity of these two wells. For example, methane levels in nearby well W-834-1833 only reached 6.9 µg/L by the end of the first semester 2009. Only one metal, manganese, has increased from less than 10 µg/L to 23 µg/L in ground water from well W-834-T2 and to 12 µg/L in ground water from well W-834-1825 as of June 2008. The Maximum Contaminant Level (MCL) for manganese is 50 µg/L. No additional metals analyses were performed during the first semester 2009, but are scheduled for the second semester 2009 and will be reported in the 2009 Annual CMR. Another water quality concern related to Na Lactate injection is salinity impact. Salinity is closely tracked as part of this study by monitoring specific conductance using *in situ* YSI probes in performance wells W-834-T2, W-834-1825 and W-834-1833. Based on these *in situ* probes, specific conductance increased by an order-of-magnitude in the two wells (W-834-1824 and W-834-1825) where Na Lactate was injected directly. Note that during the tracer test phase of this study, when only low salinity H-H water was being injected into well W-834-1824, salinity increases were also observed but these increases were apparently related to dissolution of salts in the vadose zone between the H-H injection well and the performance wells. A continued increase in specific conductance was observed in ground water from well W-834-T2 (1,700 microsiemens [µS] in December 2008 and 2,000 µS in May 2009), whereas the specific conductance in ground water from well W-834-1833 remained essentially constant throughout the year. The increase in specific conductance in ground water from well W-834-T2 is probably due to a combination of Na Lactate injection and natural salts in the vadose zone. One of the water quality benefits of sustaining reducing conditions is denitrification. Nitrate concentrations have declined by up to an order-of-magnitude in the treatment zone due to denitrification by natural bacteria that convert NO_3 to N_2 gas.

To date, no adverse water quality impacts have been observed outside the treatment zone. The deep $Tnbs_1$ HSU beneath the T2 treatment zone remains devoid of VOCs based on ground water analytical results from $Tnbs_1$ guard well W-834-T1. Nearby Tpsg wells, W-834-T2B and W-834-T2C, located southwest of the treatment zone, remain “dry.” Total VOC concentrations in Tpsg wells located upgradient (W-834-2117) and downgradient (W-834-2118) of the treatment zone, and in Tps-clay well (W-834-2119) located within the footprint of the treatment zone, did not significantly change during 2008. None of the wells located outside the treatment zone exhibited any significant changes in total VOC concentrations or any evidence of intrinsic bioremediation.

Performance monitoring will continue during 2009 and 2010 to further evaluate this passive, *in situ* technology. In addition to VOCs and metals, performance wells will be monitored for: (1) volatile fatty acids to ensure that adequate nutrients are available for bacterial dechlorination; (2) LHCs to confirm complete dechlorination of TCE to ethene; and (3) delta deuterium (H2O) and delta oxygen-18 (H_2O) to estimate the proportion of injected H-H water to natural ground water in the treatment zone. Water quality impacts within the treatment zone and both laterally and vertically beyond the treatment zone will be monitored for significant increases in VOCs, salinity, metals (chromium, arsenic, manganese, selenium, and iron), and methane. After enough post-bioaugmentation monitoring has been performed (~ 1 year) to adequately assess the performance of this technology, different options will be evaluated for future remediation of the 834 distal area including expanding this passive approach, implementing active extraction and treatment methods, or some combination of both approaches.

2.2.3.5. Building 834 OU Remedy Performance Issues

There were no new issues that affect the performance of the cleanup remedy for the Building 834 OU during this reporting period. Although the remedy continues to be effective and protective of human health and the environment, and to make progress toward cleanup in the Tpsg HSU, it has not had significant impact decreasing VOC concentrations in the underlying Tps clay HSU beneath the core area.

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. This landfill was used from 1964 to 1973 to bury waste in nine unlined debris trenches and animal pits. The buried waste, which includes laboratory equipment, craft shop debris, 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 monitoring and water-supply wells is presented in 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 and indicates any additions made to the CMP.

During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring and post-closure requirements with the following exceptions; thirty-two required analyses were not performed because there was insufficient water in the wells to collect the samples. A ground water elevation contour map is presented in Figure 2.3-2.

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 Analysis of Contaminant Distribution and Concentration

At the Pit 6 Landfill OU, VOCs and tritium are the primary COCs detected in ground water. Perchlorate and nitrate are secondary COCs. These constituents have been identified within the Qt-$Tnbs_1$ HSU.

The distribution of total VOCs and tritium in the Qt-$Tnbs_1$ HSU based on data collected during the first semester (first quarter) 2009 are contoured on Figures 2.3-3 and 2.3-4, respectively. Isoconcentration contour maps for the secondary COCs will be presented next semester in the 2009 Annual CMR report.

2.3.2.1.1. Total VOC Contaminant Concentrations and Distribution

TCE and cis-1,2-DCE were detected within the Qt-$Tnbs_1$ HSU during the first semester of 2009. Total VOC concentrations during the first semester ranged from 8.9 μg/L (EP6-09, January 2009) to below the reporting limit (<0.5 μg/L).

TCE concentrations have decreased from the historic maximum of 250 μg/L (K6-19, 1988) to a maximum concentration of 8.9 μg/L during the first semester of 2009 (EP6-09, January 2009). During the first semester of 2009, cis-1,2-DCE was detected in samples from a single Pit 6 Landfill OU well at a maximum concentration of 2.2 μg/L (K6-01S, May 2009). The presence of cis-1,2-DCE, a degradation product of TCE, suggests that some natural dechlorination may be occurring. PCE was not detected during the first semester of 2009.

VOCs were not detected in samples collected during the first semester of 2009 from guard wells W-PIT6-1819, K6-17, K6-22, and K6-34.

2.3.2.1.2. Tritium Contaminant Concentrations and Distribution

Tritium was detected above the 100 pCi/L background activity in samples from several wells completed in the Qt-$Tnbs_1$ HSU both north of the fault and within the fault zone. The maximum first semester 2009 tritium activity in ground water was 354 pCi/L (K6-18, March 2009). No tritium activities exceeded the State Public Health Goal (PHG) (400 pCi/L) or the cleanup standard (20,000 pCi/L).

Historically, the highest tritium activities in ground water in the Pit 6 Landfill OU were measured at K6-36 (3,420 pCi/L in 2003). K6-36 has been dry since ground water levels have declined below the screen in this well in October 2006. Because the Qt-$Tnbs_1$ HSU is likely saturated below the well screen, the August 2006 tritium activity of 1,200 pCi/L was used to conservatively create the isoconcentration contours presented on Figure 2.3-4, and thus the 1,000 pCi/L contour is shown. Similarly, during first quarter 2009, well K6-24 was dry with the Qt-$Tnbs_1$ HSU likely saturated below the well screen; the most recent tritium activity (407 pCi/L, January 2008) was used for contouring and thus the 400 pCi/L contour is shown.

During the first semester of 2009, tritium activities were detected in ground water samples from well K6-03 at 116 pCi/L (March 2009) and from well W-PIT6-1819 at 204 pCi/L (March 2009) and 188 pCi/L (in a re-sample collected in June 2009). Prior to the first semester of 2009, tritium had not been detected in samples from K6-03 above the 100 pCi/L detection limit. However, the March 2009 tritium activity for K6-03 was measured with an error of 52 pCi/L; thus, the error bar for this measurement extends well into the background range (<100 pCi/L). Prior to the first semester of 2009, tritium activities in well W-PIT6-1819 ranged from <100 pCi/L to 295 pCi/L. This well is used to define the downgradient extent of the tritium plume. It is located approximately 100 ft west of the Site 300 boundary with the Carnegie State Vehicle Recreation Area residence area and about approximately 200 ft west of the CARNRW1 and CARNRW2 water-supply wells (Figure 2.3-4).

Tritium was also detected during the first semester of 2009 in samples from five $Tnbs_1$ wells that historically have been either exclusively <100 pCi/L or primarily <100 pCi/L with sporadic low level detections. It should be noted that the tritium activities (March 2009) for these wells include errors of either 52 or 53 pCi/L, which also yield error bars that extend into the range of background. Two of these five wells were also sampled for tritium in June 2009 and the results for both samples were <100 pCi/L.

Tritium activities were below 100 pCi/L in all the monthly samples obtained from the four off-site CARNRW wells during the first semester of 2009. The tritium plume appears to be relatively stable and tritium activities in ground water samples from monitoring wells within the plume are generally decreasing.

2.3.2.1.3. Perchlorate Contaminant Concentrations and Distribution

During the first semester of 2009, perchlorate was detected at or above the 4 µg/L reporting limit in three Pit 6 Landfill OU samples. A March 2009 sample from well K6-18 (completed in the Qt-$Tnbs_1$ HSU within the fault zone) contained 6.2 µg/L of perchlorate, and a duplicate sample revealed 6.9 µg/L perchlorate. These concentrations are slightly above the 6 µg/L cleanup standard. Perchlorate concentrations in K6-18 have generally been declining from the 1999 maximum of 57 mg/L. Perchlorate was detected in a January 2009 sample from EP6-07 at the reporting limit of 4.0 mg/L. The historic maximum perchlorate concentration in a sample from this well is 6.9 mg/L (July 2005), and recent concentrations have been either below or slightly above the reporting limit. Perchlorate was not detected in the samples collected from any of the other monitor wells or CARNRW water supply wells during the first semester of 2009. Perchlorate concentrations in ground water have been steadily decreasing from the historic maximum concentration of 65.2 µg/L in a sample collected from well K6-19 in 1998.

2.3.2.1.4. Nitrate Contaminant Concentrations and Distribution

During the first semester of 2009, nitrate was detected in samples collected from wells completed within the Qt-Tnbs$_1$ HSU within and north of the fault zone. Nitrate was detected in ground water above the 45 mg/L cleanup standard in four Pit 6 Landfill OU samples. In February 2009, nitrate was detected in a ground water sample from well K6-23 at a concentration of 170 mg/L. Well K6-23 consistently yields ground water nitrate concentrations in excess of the nitrate cleanup standard and is located in close proximity to the Building 899 septic system, which may be a potential source of the nitrate at this location. In March 2009, two samples collected from well K6-18 (both the routine and duplicate) yielded 52 mg/L of nitrate which marks the first time that nitrate has been detected in excess of the cleanup standard in a sample from this well since 78 mg/L was detected in 1998. The previous sample (January 2008) from this well contained 10 mg/L of nitrate. This well was re-sampled for nitrate during May 2009 and yielded 54 mg/L. The source of recent elevated nitrate concentrations in well K6-18 is currently unknown. The only known potential release site for elevated nitrate in the area is the septic system at Building 899, which is located over 200 ft downgradient (southeast) of well K6-18.

Nitrate was detected above the 0.5 mg/L reporting limit in two of the monthly samples collected during the first semester of 2009 from water-supply well CARNRW1. The January and May 2009 samples both yielded 0.7 mg/L of nitrate. Historically, nitrate concentrations in samples from this well have typically been <0.5 mg/L with occasional low concentrations above the reporting limit.

2.3.2.1.5. Status of Uranium Statistical Limit Exceedence at Well EP6-08

Samples from the six detection monitoring wells at Pit 6 (EP6-06, EP6-08, EP6-06, K6-01S, K6-16, and K6-36) are collected and analyzed quarterly for total uranium by alpha spectrometry when sufficient water is available to collect a sample. The resulting data are compared to Statistical Limits for each respective well. The Statistical Limits are calculated based on a statistical analysis of the historic uranium data for each well and are meant to define evidence of a potential release of the chemical from the landfill. These data and the corresponding comparison to the Statistical Limits are documented in the quarterly Pit 6 Monitoring Reports.

During January 2008, total uranium in a ground water sample from well EP6-08 exceeded its 1.5 pCi/L Statistical Limits with an initial activity of 2.8 pCi/L. As required, a 7-day letter indicating Statistically Significant Evidence of Release from the landfill was submitted to the RWQCB (Jackson, 2008) and as is standard, the responsibility for determining if an actual release of uranium from Pit 6 had occurred was transferred to CERCLA investigations (Blake and Taffet, 2008a). Two subsequent re-samples collected later in the month yielded activities of 2.1 and 2.6 pCi/L. In April 2008, samples were collected and analyzed by mass and alpha spectrometry. The mass spectrometry sample yielded a $^{235}U/^{238}U$ atom ratio indicative of natural uranium (0.0072) and a total activity of 3 pCi/L (Blake and Taffet, 2008b). The alpha spectrometry sample yielded 2.2 pCi/L. Although continued analysis of uranium samples was planned for well EP6-08, the well went dry in April 2008 and additional sampling has not been possible. LLNL will continue to attempt to collect samples from the well every quarter. When and if sufficient water becomes available due to rising water levels, the investigation of uranium activity in ground water from this well will continue. At present, the water table north of the fault zone has declined so that several detection monitoring wells are dry or cannot yield sufficient water for sampling. When sufficient water has been available, samples from the other five detection monitoring wells at Pit 6 have continued to yield total uranium activities below their respective Statistical Limits for total uranium. Although total uranium activities were increasing slightly in the months leading up to the well going dry, all historic uranium data collected in the Pit 6 area are well below the 20 pCi/L cleanup standard and do not indicate a release of uranium from the landfill. In the near-future, a suite of samples for uranium analysis will be collected from several of the performance monitoring wells at Pit 6 to supplement the detection monitoring data and conclusively determine whether there is any evidence for a release of uranium from Pit 6.

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 elevations and contaminants are monitored on a regular basis to: (1) evaluate the efficacy of the natural attenuation remedy in reducing contaminant concentrations, and (2) detect any new chemical releases from the landfill. In general, all primary and secondary ground water COCs at the Pit 6 Landfill OU exhibit stable to decreasing trends and ground water elevations beneath the landfill remain well below the buried waste. In fact, ground water levels in the Qt-Tnbs$_1$ HSU north of the fault dropped below the screened portion of many of the monitor wells in this area. Consequently, many of the samples that were scheduled for first semester 2009 could not be collected. This decline in water levels is due to a combination of lower than average rainfall and continued pumping from CARNRW1 and CARNRW2.

There has been a decline in perchlorate concentrations in Pit 6 area ground water from a maximum of 65.2 µg/L in 1998. Perchlorate was detected in ground water above the reporting limit (4 µg/L) in samples from two Pit 6 wells during the first semester 2009 at a maximum of 6.9 µg/L. Tritium activities in ground water continue to decrease toward background levels and remain far below the 20,000 pCi/L cleanup standard; tritium activities did not exceed the 400 pCi/L PHG. TCE concentrations in ground water remain above the 5 µg/L cleanup standard in samples from only one well (EP6-09) and the concentrations and extent of total VOCs in ground water are generally declining with a current maximum of 8.9 µg/L.

2.3.2.3. Pit 6 Landfill OU Performance Issues

Declining water levels north of the fault have impacted the monitoring component of the cleanup remedy for the Pit 6 Landfill OU during this reporting period. Despite these conditions, all scheduled samples were collected from guard well W-PIT6-1819 and water supply wells CARNRW1 and CARNRW2. 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 located near Building 829.

Six GWTSs 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), Building 817-Proximal (817-PRX), and Building 829-Source (829-SRC). A map of the HEPA OU showing the locations of monitoring and extraction wells and treatment facilities is presented in Figure 2.4-1.

The 815-SRC GWTS began operation in September 2000 removing TCE, RDX, and perchlorate from ground water. Initially, the system extracted from one extraction well, W-815-02 and consisted of aqueous-phase GAC, an ion-exchange system, and an anaerobic bioreactor for nitrate destruction. The treated effluent was discharged to a misting system. The anaerobic bioreactor was decommissioned in 2003. In 2005, the wellfield was expanded to include extraction well, W-815-04 with a current combined flow rate of approximately 1.4 gpm. The current GWTS configuration includes a Cuno filter to remove particulates, three aqueous-phase GAC canisters connected in series for TCE and RDX removal, and two ion-exchange columns containing SR-7 resin (also connected in series) for perchlorate removal. In 2005, the discharge method of misting was replaced by injection of the treated effluent into well W-815-1918 for *in situ* denitrification in the $Tnbs_2$ HSU.

The 815-PRX GWTS 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 1.6 gpm. The current GWTS configuration includes a Cuno filter to remove particulates, two ion-exchange columns with SR-7 resin that are connected in series for perchlorate removal, and three aqueous-phase GAC (also connected in series) for TCE removal. In 2005, the discharge method of misting was replaced by injection of the treated effluent into well W-815-2134 where an *in situ* natural denitrification process reduces the nitrate to nitrogen in the $Tnbs_2$ HSU.

The 815-DSB GWTS began operation in September 1999 removing low concentrations (less than 10 µg/L) of TCE from ground water extracted near the Site 300 boundary. Ground water is currently extracted from wells W-35C-04 and W-6ER at a combined flow rate of approximately 3 to 4 gpm. The GWTS originally operated intermittently on solar-power until site power was installed in 2005 when 24-hour operations began. The treated effluent is discharged to an infiltration trench.

The 817-SRC GWTS began operation in September 2003 removing RDX and perchlorate from ground water. Well W-817-01 extracts ground water from a very low yield portion of the $Tnbs_2$ aquifer. It pumps ground water intermittently using solar power at flow rates ranging from 300 to 900 gallons per month. The current GWTS configuration includes two ion-exchange columns with SR-7 resin that are connected in series for perchlorate removal, a Cuno filter to remove particulates, and three aqueous-phase GAC (also connected in series) for RDX 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 $Tnbs_2$ HSU.

The 817-PRX GWTS began operation in September 2005 removing VOCs, RDX, and perchlorate from ground water. Initially, ground water was extracted from wells W-817-03 and W-817-04 at a combined flow rate of approximately 1.0 gpm, although the vast majority of ground water was extracted from well W-817-03. In 2007, the extraction wellfield was expanded to include extraction well, W-817-2318. Due to the low yield from ground water extraction well W-817-04, extraction from this well was discontinued in December 2007.

Ground water is currently extracted at a combined flow rate of approximately 1.5 gpm. The current GWTS configuration includes a Cuno filter to remove particulates, two aqueous-phase GAC canisters connected in series for TCE and RDX removal, two ion-exchange columns containing SR-7 resin (also connected in series) for perchlorate removal, and a third aqueous-phase GAC canister completes the treatment chain. Treated ground water containing nitrate is injected into upgradient injection wells W-817-2109 and W-817-02 that was added in 2007. The treated effluent is split between the two injection wells where an *in situ* denitrification process reduces the nitrate to nitrogen in the $Tnbs_2$ HSU.

The 829-SRC GWTS began operation in August 2005 removing VOCs, nitrate, and perchlorate from ground water. Solar power is used to extract ground water from well W-829-06 at a flow rate of approximately 1 to 4 gallons a day. The current GWTS configuration includes two ion-exchange columns containing SR-7 resin connected in series for perchlorate removal, three aqueous phase GAC canisters (also connected in series) for VOC removal, and a biotreatment unit to treat nitrate. However, the biotreatment unit has not been utilized because all the nitrate has to date been adsorbed by the SR-7 resin. Treated effluent is injected into upgradient well W-829-08.

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 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 this reporting period is 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 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 and operational issues interrupted continuous operations of the 815-SRC, 815-PRX, 815-DSB, 817-SRC, 817-PRX, and 829-SRC GWTSs during second semester:

<u>815-SRC GWTS</u>

- The ion-exchange resin was replaced on February 9.
- A site-wide power outage occurred at Site 300 on April 23, as a result, GWTS was shut down and secured to prevent facility damage and/or compliance issues when the power was restored. The GWTS was restarted on April 27.

<u>815-PRX GWTS</u>

- The GWTS was shut down from December 10 to February 10 to prevent freeze damage.

- A site-wide power outage occurred at Site 300 on April 23, as a result, GWTS was shut down and secured to prevent facility damage and/or compliance issues when the power was restored. The GWTS was restarted on April 27.
- The GWTS was shut down on April 29 to repair a cracked union at the wellhead of W-815-09. The system was restarted May 4.
- The GWTS shut down on May 21 and was restarted May 26. The cause of the shutdown is unknown.

<u>815-DSB GWTS</u>

- Extraction wells W-35C-04 and W-6ER went down due to burnt out pumps on February 18 and March 2, respectively. The GWTS was restarted on March 2; pumping only from extraction well W-6ER. A new pump was installed in well W-35C-04 on March 20 and the system was restarted on March 24. The pump in well W-35C-04 failed again on June 15 and will be replaced during the next semester.

<u>817-SRC GWTS</u>

- The GWTS was shut down from December 10 to February 2 to prevent freeze damage. A re-start was attempted at this time, but the extraction well pump in W-817-01 was found to be non-functional. The pump was replaced and the system restarted on February 24.
- The pump in extraction well W-817-01 again stopped working on March 16; however, the facility is still operational. The pump stoppage may be due to lack of water in the well.

<u>817-PRX GWTS</u>

- The GWTS was shut down from November 19 to March 10 while system software problems were resolved.
- A site-wide power outage occurred at Site 300 on April 23, as a result, GWTS was shut down and secured to prevent facility damage and/or compliance issues when the power was restored. The GWTS was restarted on April 27.
- A change-out of the granular activated carbon treatment media was conducted on April 28.

<u>829-SRC GWTS</u>

- The GWTS remains offline since October 15 due to electrical issues with the compressor operation.

2.4.1.3. HEPA OU Compliance Summary

The 815-SRC, 815-PRX, 815-DSB, 817-SRC, and 817-PRX GWTSs operated in compliance with the Substantive Requirements for Wastewater Discharge. The 829-SRC GWTS did not operate during this reporting period.

2.4.1.4. HEPA OU Facility Sampling Plan Evaluation and Modifications

The HEPA OU facility sampling and analysis plan complies with CMP monitoring requirements. The sampling and analysis plan is presented in Table 2.4-10.

2.4.1.5. HEPA OU Treatment Facility and Extraction Wellfield Modifications

No modifications were made to any of the HEPA Treatment Facilities during this reporting period. The only wellfield modification occurred at 817-PRX where re-injection of treated water into W-817-02 was discontinued upon restart in March. All treated water is now injected solely into W-817-2109.

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; thirty-six required analyses were not performed because there was insufficient water in the wells to collect the samples, four required analyses were not performed because the treatment facility was not operational, and one required analysis was not performed due to an inoperable pump.

Ground water elevation data are contoured for the $Tnbs_2$ HSU and are posted for the Tpsg and $Tnsc_{1b}$ (Building 829 area) HSUs as presented in Figures 2.4-2, 2.4-4 and 2.4-6.

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 are summarized in Tables 2.4-12 through 2.4-17. The total mass removed during this 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 ground water contamination at the HEPA is present in the $Tnbs_2$ HSU. Minor amounts of VOCs, perchlorate, and nitrate contamination are present in perched ground water beneath the Waste Accumulation Area in the $Tnsc_{1b}$ HSU. The Waste Accumulation Area is located in the northwest portion of the HE Process Area. Some TCE, RDX, and perchlorate have also been detected in the vicinity of Building 815 in perched ground water in the Tpsg sands and gravels of the Tpsg-Tps HSU. No contamination has been detected in the Tps portion of the Tpsg-Tps HSU, or the upper and lower $Tnbs_1$ HSUs in the HEPA OU.

Total VOC concentration data are contoured for $Tnbs_2$ and posted for Tpsg and $Tnsc_{1b}$ based on data collected during the first semester 2009 and are presented on Figures 2.4-3, 2.4-5, and

2.4-6. Isoconcentration contour maps for the secondary COCs will be presented in the 2009 Annual CMR report.

2.4.3.2.1. Total VOC Contaminant Concentrations and Distribution

During the first semester 2009, the maximum total VOC concentration measured in samples from $Tnbs_2$ wells was 52 µg/L in extraction well W-818-11 (March 2009). This value represents a slight increase from the concentration (45 µg/L) measured in groundwater from the same well last semester. The $Tnbs_2$ total VOC plume is detached from its source at Building 815 and the 815-PRX extraction wellfield captures the plume's highest concentrations. Total VOC concentrations in ground water in the $Tnbs_2$ HSU in the HEPA have decreased from a historic maximum concentration of 110 µg/L (W-818-08, May 1992), yet the plume has much the same shape and extent as in previous years. VOCs continue to be detected in ground water from well W-830-2216 located at the southern end of Building 832 Canyon. This contamination probably comes from sources in Building 832 Canyon. Well W-830-2216 was connected as an extraction well to the 830-DISS treatment facility in June 2007.

During the first semester 2009, low VOC concentrations (<3 µg/L) were detected in samples from $Tnbs_2$ guard wells W-815-2110 and W-815-2111, located near the southern site boundary. VOCs were also detected in ground water at very low (<1 µg/L) concentrations in offsite $Tnbs_2$ guard well W-35B-04. VOCs were not detected in samples taken from any of the other onsite or offsite HEPA $Tnbs_2$ guard wells. However, very low VOC concentrations (<1 µ g/L) were detected in six of sixteen samples collected from offsite water-supply well GALLO1 during the first semester 2009. The 817-PRX and 815-DSB facilities were installed to minimize migration of VOCs near the site boundary. Due to pump problems, the 815-DSB facility did not operate at full capacity during the semester. Continuous operation of the 815-DSB facility is expected to mitigate extended migration of VOCs downgradient of this facility and offsite.

At the 829-SRC treatment facility, total VOCs samples were not collected from 829-SRC ($Tnsc_{1b}$) extraction well W-829-06 during the first semester 2009 due to an inoperable pump. During the second semester 2008, 17 µg/L of total VOCs were detected in groundwater in this well (July 2008). Total VOC concentrations in ground water from well W-829-06 have decreased significantly from a historic maximum of 1,013 µg/L (August 1993). VOCs have never been detected in ground water from nearby monitoring well W-829-1940.

In the vicinity of Building 815, VOCs (mainly TCE) have been detected in the Tpsg sands and gravels of the Tpsg-Tps HSU. Total VOC concentrations in this HSU have generally been decreasing over time and the limited recharge to this zone has resulted in declining water levels resulting in insufficient water for sampling. The maximum first semester 2009 VOC concentration detected in samples from Tpsg-Tps wells was 48 µg/L in 817-PRX extraction well W-817-2318 (March 2009). VOCs in the Tpsg-Tps well W-35C-05, located near the site boundary, remain below the 0.5 µg/L reporting limit.

During the first semester 2009, low total VOC concentrations were detected in one of two samples collected from Qal/WBR guard well W-880-02 (0.53 µg/L, May 2009). Historically, ground water from well W-880-02 has intermittently had trace concentrations of total VOCs. Trace total VOC contamination in these wells is probably from Building 832 Canyon sources. Total VOC concentrations in ground water from Qal/WBR wells W-35C-06 and W-6ES, located near the site boundary, remain below the 0.5 µg/L reporting limit.

2.4.3.2.2. HE Compound Contaminant Concentrations and Distribution

During the first semester 2009, RDX concentrations detected in samples from $Tnbs_2$ wells ranged from <1 µg/L to a maximum of 50 µg/L in well W-815-02 (January 2009). RDX concentrations in 817-SRC extraction well W-817-01 (also screened in the $Tnbs_2$ HSU) have decreased, from a historic maximum of 204 µg/L in July 1992 to below the reporting limit during the first semester 2009. These low concentrations and the decreased extent of RDX plume northeast of the 817-SRC treatment facility suggest that the 817-SRC injection-extraction loop has been effective in removing contaminants.

RDX concentrations have also decreased downgradient of the 817-SRC area. Despite this decrease, the extent of most RDX contamination in the $Tnbs_2$ HSU remains essentially the same. The southeastern front of the RDX plume northwest of 815-PRX treatment facility extraction wells remains relatively stable. Small decreases in the southwestern portion of the RDX plume extent are observed and are likely due to the 817-PRX treatment facility injection-extraction loop. Conversely, ground water concentrations trends appear to be increasing north of 815-SRC treatment facility injection well W-815-1918. This result may be due to mobilization of RDX by injection of treated ground water into nearby 815-SRC injection well W-815-1918.

RDX was not detected in any of the $Tnbs_2$ guard wells or in any of the $Tnsc_{1b}$ wells, in the first semester 2009. However, due to an inoperable pump, no groundwater samples were collected from $Tnsc_{1b}$ extraction well W-829-06. RDX was detected for the first time in ground water from the Tpsg-Tps HSU in well W-815-1928 at a concentration of 19 µg/L in 2008, but in the first semester 2009, no samples were collected because the well was dry. Historically, all RDX concentrations in ground water from this well and all Tpsg-Tps wells have been <1 µg/L. Well W-815-1928 (screened in a perched water zone of the Tpsg-Tps HSU) is only periodically saturated and ground water from this well has only been sampled and analyzed for RDX twice: once in 2003 (<1 µg/L, March 2003) and once in 2008 (19 µg/L March 2008). Well W-815-1928 has been dry during all other scheduled sampling events.

HMX detections in the $Tnbs_2$ HSU are rare, but have occurred in the 817-SRC extraction well W-817-01. The highest historic HMX concentration detected in ground water in the $Tnbs_2$ HSU was 57 µg/L in 817-SRC extraction well W-817-01 (October 1995). During the first semester 2009, HMX was not detected in ground water above the reporting limit in this well. This result suggests that the 817-SRC injection-extraction well loop has been effective in removing HE compounds from ground water in this area.

During the first semester 2009, nitrobenzene was not detected above the reporting limit of 2 µg/L in any HEPA ground water samples. Previously, nitrobenzene was detected in the 817-SRC extraction well W-817-01 at a concentration of 6.2 µg/L (April, 2008), and in one sample from the influent to the 815-SRC GWTS at 4.1 µg/L. These samples were the first time nitrobenzene had been detected in ground water in the HEPA and additional samples have all been below the reporting limit.

During the first semester 2009, 4-amino-2,6-dinitrotoluene (4-ADNT) was not detected above the reporting limit of 2 µg/L in any monitor well sample. In July 2008, 4-ADNT was detected at a concentration of 7.5 µg/L in a sample collected from the influent to the 815-SRC GWTS; however, no 4-ADNT has been detected in any OU4 treatment facility samples during the first semester 2009. The highest historic concentration of 4-ADNT (24 µg/L) was measured in September 1997. These detections of HE compounds other than HMX and RDX reflect a recent change in the Site 300 sampling plan which requires LLNL to report all HE compounds detected using EPA method 8330.

2.4.3.2.3. Perchlorate Contaminant Concentrations and Distribution

Perchlorate concentrations in the $Tnbs_2$ HSU have decreased from a historic maximum of 50 µg/L (February 1998) in well W-817-01 to a first semester 2009 maximum of 25 µg/L (March 2009) in 817-PRX extraction well W-817-03. Perchlorate was not detected in any of the $Tnbs_2$ guard wells during the first semester 2009. Overall, maximum concentrations of the perchlorate plume are decreasing and the southwestern plume front is receding due to 817-PRX and 817-SRC treatment facility operations. To the north, the perchlorate plume in the $Tnbs_2$ HSU appears to be increasing based on concentration increases observed in monitor well W-809-03. This increase may be the result of mobilization of perchlorate by injection of treated ground water into nearby 815-SRC injection well W-815-1918.

During the first semester 2009, no perchlorate samples were taken from $Tnsc_{1b}$ extraction well W-829-06 due to an inoperable pump. Perchlorate concentrations in well W-829-06 have decreased from a historic maximum of 29 µg/L (December 2000) to a concentration of 9.5 µg/L detected in June 2008. Perchlorate was also detected in well W-829-1940 at a concentration of 4.0 µg/L (March 2009).

The maximum perchlorate concentration detected during the first semester 2009 in samples from Tpsg-Tps wells was 16 µg/L in 817-PRX extraction well W-817-2318 (March 2009). Perchlorate was not detected in any HEPA Qal/WBR wells during the reporting period.

2.4.3.2.4. Nitrate Contaminant Concentrations and Distribution

During the first semester 2009, nitrate concentrations in samples from the $Tnbs_2$ HSU ranged from <0.1 mg/L in the vicinity of the Site 300 boundary to a maximum of 96 mg/L (March 2009, W-817-03). Nitrate was not detected above the 45 mg/L cleanup standard in ground water from any of the $Tnbs_2$ guard wells sampled during this reporting period.

The maximum nitrate concentration detected in a sample during the first semester 2009 from the $Tnsc_{1b}$ HSU was 56 mg/L in monitor well W-829-1940. Due to an inoperable pump, extraction well W-829-06 was not sampled during the first semester 2009.

During the first semester 2009, the maximum nitrate concentration detected in ground water from Tpsg-Tps HSU well W-6CS was 660 mg/L (March 2009). Because there are no known septic systems or other Site 300 operations-related nitrate sources near this well, the elevated nitrate may be attributable to a pre-Site 300 sheep ranch that was discovered in a historic photo of the area. Ground water sampled from all other wells screened in this HSU had significantly lower nitrate concentrations. The highest nitrate concentrations found in other wells screened in this HSU were 160 mg/L in 817-PRX wells W-817-03A and W-817-2318. All ground water sampled from Qal/WBR wells had nitrate concentrations below the 45 mg/L cleanup standard.

Nitrate concentrations detected in ground water during the first semester 2009 continue to support the interpretation that nitrate is being treated *in situ* by natural processes. Due to microbial denitrification, nitrate concentrations have decreased significantly near the Site 300 boundary where the $Tnbs_2$ is under confined conditions and anoxic. Nitrate concentrations continue to be below the 45 mg/L cleanup standard in all wells near the southern site boundary.

2.4.3.3. HEPA OU Remediation Optimization Evaluation

Remediation optimization at the HEPA OU is managed by balancing extraction wellfield flow rates at the site boundary with upgradient source area pumping. Based on the $Tnbs_2$ ground water elevation map and the total VOC isoconcentration map shown on Figures 2.4-4 and 2.4-5, the existing extraction wellfield captures both the highest concentrations in the VOC plume in the vicinity of wells W-818-08 and W-818-09 (815-PRX) and the leading edge of the plume near the southern site boundary (815-DSB). Some lateral migration of the VOC plume has occurred downgradient of 817-PRX and between 815-DSB and water supply well GALLO1. A study is underway to determine the most effective way to offset the possible effects of pumping GALLO1, since GALLO1 pumping may be pulling VOCs towards the well. During 2008, flow rates from 815-PRX extraction wells W-818-08 and W-818-09 were increased to expand capture of the high concentration portions of the VOC plume.

Although the overall extent of the primary and secondary COC plumes in the HEPA has not changed significantly during the first semester 2009, total VOC and RDX concentrations within the plumes continue to decline from their historic maximums. These trends are due to a combination of natural attenuation mechanisms and remediation efforts in the source and proximal areas of this OU. Since RDX monitoring began in 1985, concentrations for this COC have continued to decline. In the 817-SRC area, concentrations of both RDX and perchlorate were not detected above the reporting limit for the second quarter 2009, and RDX concentrations in extraction well W-817-01 have been below the reporting limit for two quarters. These results suggest remediation at 817-SRC has been effective in flushing secondary COCs downgradient for removal, and in the future, this treatment facility may be a candidate for shutdown. The 815-SRC extraction wells, W-815-02 and W-815-04, have the highest RDX concentrations, and increased pumping from these wells should improve RDX remediation in this area.

Perchlorate concentrations in the $Tnbs_2$ HSU have steadily decreased since 1998 when monitoring for this COC began. The 817-SRC (W-817-01) and 817-PRX (W-817-03 and W-817-04) extraction wells have had the highest perchlorate concentrations in this OU. In early 2008, extraction from well W-817-04 was terminated due to low yield and pumping from well W-817-03 was increased. The increased extraction flow rate from well W-817-03 was discontinued in February 2008 due to limited injection well flow control and capacity. Upgrades to the 817-PRX injection well manifold control system will allow for increased ground water extraction rates from well W-817-03. These upgrades will be performed as schedules and priorities permit, and are expected to decrease perchlorate concentrations in well W-817-03. Upgradient injection at 815-SRC, 817-SRC, 815-PRX, and 817-PRX will continue to enhance remediation by flushing contaminants toward the extraction wells. Although increasing RDX and perchlorate concentrations measured in groundwater from well W-809-03 have expanded the extent of these plumes upgradient of the 815-SRC extraction wellfield, the areas of increased concentrations are still within hydraulic capture zones.

The Building 829-Source ground water extraction and treatment system is shut down while power supply problems and nitrate treatment issues are resolved. The operation of the site boundary treatment systems, start up of the Pit 7 treatment system, and Livermore Site treatment facility restarts are receiving higher priority.

Continuous operation of the 815-DSB facility, continued increased pumping from well W-818-08 and the 815-DSB extraction wells, and increased pumping from well W-817-03 coupled with the increase in 817-PRX effluent injection, should improve long-term ground water yield and mass removal at this OU and further prevent contaminated ground water from reaching the Site 300 southern boundary. Close monitoring of VOC concentrations in the southern site boundary area will continue, especially in the vicinity of water-supply well GALLO1.

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, and to make progress toward cleanup. Continuous operation of the 815-DSB treatment facility is crucial to the continued success of remediation efforts in the HE Process Area OU.

2.5. Building 850 Area of OU 5

High explosives experiments have been conducted at the Building 850 Firing Table. Until 1989, gravels on the firing table surface were disposed of in several disposal pits in the northern portion of the site. In the past, infiltrating water mobilized chemicals from contaminated gravel and debris to underlying soil, bedrock, and ground water. However, because explosives shots, and the accompanying practice of watering down the firing table, were discontinued in 2004, the firing table no longer releases significant contamination to the subsurface. A map of the Building 850 area within OU 5 showing the locations of monitoring wells is presented in Figure 2.5-1.

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 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; sixteen required analyses were not performed because there was insufficient water in the wells to collect the samples, six required analyses were not performed because of access issues associated with the Building 850 Soil Removal Project, and three required analyses were not performed because a bent casing prevented sample collection. Ground water elevation contour maps for the Qal/WBR and $Tnbs_1$/$Tnbs_0$ HSUs within the OU are presented in Figures 2.5-2 and 2.5-3, respectively.

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 is the primary COC detected in ground water; depleted uranium, perchlorate, and nitrate are secondary COCs. These constituents have been identified within the Qal/WBR and $Tnbs_1$/$Tnbs_0$ HSUs.

The distribution of tritium in each HSU, based on data collected during the first semester 2009 is contoured on Figures 2.5-4 and 2.5-5. Isoconcentration contour maps for the secondary COCs will be presented next semester in the 2009 Annual CMR report.

2.5.2.1.1. Tritium Contaminant Concentrations and Distribution

The maximum first semester 2009 tritium activity in ground water within the Building 850 area was 57,400 ± 5,800 pCi/L (April 2009) from well NC7-70, screened in the Qal/WBR and upper part of the $Tnbs_1/Tnbs_0$ bedrock HSU and located about 50 ft downgradient (east) of the Building 850 Firing Table. The highest tritium activities in ground water in the Building 850 area continue to be located immediately downgradient of the Building 850 Firing Table. The historic maximum of 566,000 pCi/L measured in 1985 in a sample from well NC7-28, has declined to 25,400 ± 2,600 pCi/L in 2009. The extent of the 20,000 pCi/L clean up standard ground water tritium activity contour in both the Qal/WBR and $Tnbs_1/Tnbs_0$ bedrock HSUs in Doall Ravine is similar to that of 2008.

Ground water tritium activities in most portions of the Building 850 plume continue to decline. However, tritium activities in $Tnbs_1/Tnbs_0$ HSU wells located north of Landfill Pit 1 exhibit a slowly increasing trend. Ground water samples were collected for the first time from Qal/WBR wells W-PIT2-2301 and W-PIT2-2302, located in Elk Ravine downgradient from Landfill Pit 2. Tritium within range of the 100 pCi/L background (116 ± 53 pCi/L) was detected in the ground water sample from well W-PIT2-2301. Tritium was not detected above the 100 pCi/L reporting limit in the sample from well W-PIT2-2302. Given the low activities of the Qal/WBR samples, it does not appear that tritium from Building 850 is present in the HSU in Elk Ravine. Overall, the extent of tritium in ground water with activities above the 400 pCi/L State PHG remains stable, and the extent of ground water with background tritium is similar to previous years.

2.5.2.1.2. Uranium Contaminant Concentrations and Distribution

Total uranium activities in ground water were below the 20 pCi/L cleanup standard in samples from all wells in the Building 850 area during the first semester 2009. The maximum first semester 2009 uranium activity was 17 pCi/L in a sample from well NC7-29. NC7-29, screened in the $Tnbs_1/Tnbs_0$ HSU, is located on Route 4, south of Doall Road and Building 850. Historic isotope ratio data indicate that the uranium in ground water samples from well NC7-29 is natural.

As discussed in Section 6.5, uranium analyses for the first semester 2009 were performed primarily by alpha spectroscopy with selected samples analyzed by ICP-MS (mass spectrometry). Uranium isotope data ($^{235}U/^{238}U$ atom ratio) for determining the presence of depleted uranium are only available by ICP-MS analysis. Historic uranium isotope data indicate that the distribution of ground water within the Qal/WBR and $Tnbs_1/Tnbs_0$ HSUs containing some added depleted uranium extends downgradient about 1,200 ft and 700 ft, respectively, from the Building 850 Firing Table and have remained relatively stable. Depleted uranium has also been detected in $Tnbs_1/Tnbs_0$ ground water from wells immediately downgradient of the Pit 2 Landfill and from wells located immediately north of the Building 802 area. The available uranium isotope data from the first semester 2009 suggest that this has not changed. In addition, ground water samples collected during the first semester 2009 from Qal/WBR wells W-PIT2-2301 and W-PIT2-2302, located downgradient from the Pit 2 Landfill, contain some depleted uranium, but at activities well below the 20 pCi/L cleanup standard. The maximum uranium activity in a ground water sample containing some depleted uranium was 16 pCi/L from well NC7-28; this well is screened across the Qal/WBR and $Tnbs_1/Tnbs_0$ HSUs, and is located immediately downgradient of the Building 850 Firing Table.

2.5.2.1.3. Nitrate Contaminant Concentrations and Distribution

Nitrate above the 45 mg/L cleanup standard was detected in samples from eleven Building 850 area wells during the first semester 2009. These wells are located west of Building 850, downgradient and east of Building 850, south-southeast of Building 850, and southeast of Pits 1 and 2. The maximum first semester 2009 nitrate concentration detected in a Building 850 area ground water sample was 180 mg/L in the sample from well NC7-29, which equals the historic local maximum also detected in a ground water sample from the same well in June 2007. Historic data indicate that ground water nitrate concentrations in the two HSUs are limited in extent and relatively stable. Overall, the distribution and concentrations of nitrate in ground water are generally similar to those observed in previous years.

2.5.2.1.4. Perchlorate Contaminant Concentrations and Distribution

During the first semester 2009, perchlorate at concentrations exceeding the 6 µg/L cleanup standard was detected in ground water samples from wells east and south of Building 850, in Doall Ravine, and east of Pit 1. The maximum perchlorate concentration of 69 µg/L was detected in well NC7-28, located downgradient of the Building 850 Firing Table, in January 2009. Wells downgradient of the Building 850 Firing Table continue to exhibit the highest perchlorate concentrations in the Building 850 area.

In the first semester 2009, perchlorate concentrations exceeded the cleanup standard in samples from wells K1-02B (7.3 µg/L) and W-PIT1-2326 (6.2 µg/L), both located downgradient of Pit 1. Perchlorate at a concentration above the 4 µg/L reporting limit, but below the 6 µg/L cleanup standard, was also detected in a sample from well K1-06 (4.6 µg/L). Well W-PIT1-02 (4.4 µg/L, July 2008) was not sampled during the first semester 2009 due to an inoperable pump. Ground water downgradient of Pit 1 is monitored to evaluate the extent of the contaminant plumes emanating from Building 850 as part of the CERCLA cleanup program. Detection monitoring for potential releases from the Pit 1 Landfill is conducted under Waste Discharge Requirements issued by the RWQCB, as this landfill is not part of the CERCLA program at Site 300. Detection monitoring results for the Pit 1 Landfill are currently reported in the quarterly Compliance Monitoring Program reports for the RCRA-closed Pit 1 and 7 Landfills.

The overall extent of perchlorate in ground water in the Building 850 and Pit 1 and 2 areas did not change significantly during the first semester 2009 and will continue to be closely monitored.

2.5.2.1.5. HE Compound Contaminant Concentrations and Distribution

During the first semester 2009, ground water samples from fifteen wells located in or downgradient of the Building 850 Firing Table were collected and analyzed for the HE compounds, HMX and RDX at a 1 µg/L reporting limit. The RDX cleanup standard (1 µg/L) was exceeded in samples from three of the fifteen wells. The maximum RDX concentration of 6.7 µg/L was detected in a sample from well NC7-28, which is located immediately east of the Building 850 Firing Table. Well W-850-2417, which had the maximum RDX concentration of 5.9 µg/L in 2008, was not sampled during the first semester 2009 because it was inaccessible during the ongoing Building 850 Removal Action. The data indicate that RDX exceeding the cleanup standard extends about 800 feet east of Building 850 in the Qal/WBR HSU. HMX was detected above reporting limit in samples from five wells. The maximum HMX concentration of 10 µg/L, detected in a sample from well NC7-28, is significantly below the Regional Tapwater Screening Level for HMX (1,800 µg/L). HE compounds were not detected above the reporting limit in ground water samples from wells screened in the $Tnbs_1$/$Tnbs_0$ HSU downgradient of Building 850 or from wells screened in the underlying $Tnsc_0$ HSU. The data indicate that the extent of HE compounds in the ground water is limited to the Building 850 Firing Table and the Qal/WBR HSU immediately downgradient. Future sampling for HE compounds will be used to evaluate trends and determine whether or not an active HE source exists in the vadose zone beneath the firing table.

2.5.2.2. Building 850 Area OU Remediation Optimization Evaluation

MNA is the selected remedy for remediation of tritium in ground water emanating from the Building 850 area. Recent data indicate MNA continues to be effective in reducing tritium activities in ground water. The highest tritium activities in ground water continue to be located immediately downgradient of the tritium sources at the Building 850 Firing Table and continue to decline. The extent of the 20,000 pCi/L cleanup standard tritium activity contours in both HSUs continues to diminish. The significant decreases in activities and extent of the Building 850 tritium plume with activities exceeding the cleanup standard indicate that natural attenuation (dispersion, radioactive decay and a decreasing source term) continues to be effective in reducing tritium activities in ground water. In general, ground water tritium activities continue to decline and are significantly below historic highs throughout the Building 850 plume.

Total uranium activities in ground water are below the 20 pCi/L cleanup standard in samples from all wells in the Building 850 area. The overall extent of total uranium activities at Building 850 has not changed significantly. The remediation strategy for uranium at Building 850 continues to be protective given that: (1) total uranium activities in Building 850 ground water generally remain below the 20 pCi/L cleanup standard; (2) the areal extent of depleted uranium has not changed during the period of monitoring; and (3) the temporal trends in $^{235}U/^{238}U$ isotope ratios from past samples have remained stable.

The overall extent and maximum concentrations of nitrate and perchlorate in ground water are also similar to those observed in previous years. An *in situ* perchlorate bioremediation treatability test is scheduled for 2010. The objective of this test is to evaluate the efficacy of *in situ* enhanced remediation methods to reduce perchlorate ground water concentrations immediately downgradient of the Building 850 firing table. Recently installed well W-850-2417 will serve as a reagent injection well and nearby downgradient wells NC7-28 and W-850-2416 will serve as performance monitor wells for this test.

2.5.2.3. Building 850 Area OU Remedy Performance Issues

There were no new issues that affect the performance of the cleanup remedy (MNA) 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 to make progress toward cleanup. Perchlorate, uranium, and RDX in ground water downgradient of the Building 850 Firing Table will continue to be closely monitored and reported. Temporal trends in these COCs will be used to assess whether an active source for any of the contaminants remains beneath the firing table. An *in situ* bioremediation treatability test is planned to remediate perchlorate in ground water in the Building 850 source area. Although this treatability test will specifically target perchlorate, the performance of this technology with respect to uranium and RDX remediation or stabilization will also be evaluated. This test has been delayed pending finalization by the RWQCB of the WDR-R5-2008-0149 permit for *in situ* remediation and also by the Building 850 Removal Action, which is scheduled to be completed during calendar year 2009.

2.6. Building 854 OU 6

The Building 854 Complex was 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 monitoring and extraction wells and treatment facilities is presented in Figure 2.6-1.

Three GWTSs 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 SVTS is also operated at 854-SRC.

The 854-SRC GWTS began operation in December 1999 removing VOCs and perchlorate from ground water. Ground water extraction was expanded in September 2006 from one well, W-854-02 extracting at a flow rate of approximately 1 gpm to include wells W-854-18A, W-854-17, and W-854-2218 currently extracting at an approximate combined flow rate of 2.0 to 2.7 gpm. The GWTS configuration includes a particulate filtration system, two ion-exchange columns containing SR-7 resin connected in series for perchlorate removal, and three aqueous-phase GACs connected in series for VOC removal. Nitrate-bearing treated effluent is then discharged via a misting tower for atomization and onto the landscape for uptake and utilization of the nitrate by indigenous grasses.

A SVTS began operation at the 854-SRC in November 2005. Soil vapor is currently extracted from well W-854-1834 at an approximate flow rate of 45 to 50 scfm. This system consists of vapor-phase GAC to remove VOCs from extracted soil vapor. Treated vapors are discharged to the atmosphere under permit from the San Joaquin Valley Unified Air Pollution Control District.

The 854-PRX GWTS began operation in November 2000 removing VOCs, nitrate, and perchlorate from ground water. Ground water is currently extracted at an approximate flow rate of 1.5 gpm from well W-854-03, located southeast of the Building 854 complex. The GWTS configuration includes two ion-exchange columns containing SR-7 resin connected in series for perchlorate removal, three aqueous-phase GACs connected in series for VOC removal, and aboveground containerized wetland biotreatment for nitrate removal prior to being discharged into an infiltration trench. In 2007, the treatment system was modified to replace the solar power with site power to increase the volume of extracted ground water by operating the GWTS 24-hours a day.

The 854-DIS GWTS 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. The current operational flow rate averaged over time is approximately 750 gallons per month. The GWTS configuration includes two SR-7 ion-exchange resin columns connected in series for perchlorate treatment followed by three aqueous-phase GACs connected in series for VOC removal prior to discharge to an infiltration trench.

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 and rates and operational hours 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 is 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 are shown 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 and operational issues interrupted continuous operations of the 854-SRC GWTS and SVTS, and 854-PRX and 854-DIS GWTSs during first semester 2009:

<u>854-SRC GWTS</u>

- Extraction wells W-854-17 and W-854-18A were shut off from December 10, 2008 to January 20 to protect the facility from freeze damage.
- A GAC change-out was performed on January 28.
- A site-wide power outage occurred at Site 300 on April 23, as a result, the GWTS and SVTS were shut down and secured to prevent facility damage and/or compliance issues when the power was restored. The treatment systems were restarted on April 27.
- The 854-SRC SVTS was offline for multiple days on several occasions during the reporting period due to high temperature interlock alarms.

<u>854-PRX GWTS</u>

- The GWTS was shut down from December 10, 2008 to January 20 to protect the facility from freeze damage.
- A site-wide power outage occurred at Site 300 on April 23. The facility was restarted on April 27.
- The extraction well pump failed on June 24 and will be replaced during the next semester.

<u>854-DIS GWTS</u>

- The GWTS was shut down from December 9, 2008 to February 17 to protect the facility from freeze damage.
- GWTS was shut down on June 8 due to a detection of nitrate in the effluent at concentrations above the effluent discharge limit. The system was restarted on June 16 to collect additional samples to confirm the detection. The system was shut down after sample collection. The samples did not contain nitrate above the discharge limit,

therefore the system was restarted on June 22. It was later determined that the analytical laboratory had in error initially reported a nitrate concentration of 77 mg/L, and later reported an effluent nitrate concentration of 7.7 mg/L.

2.6.1.3. Building 854 OU Compliance Summary

The 854-SRC, 854-PRX, and 854-DIS GWTSs all operated in compliance with the Substantive Requirements for Wastewater Discharge. The 854-SRC SVTS operated in compliance with the San Joaquin Valley Unified Air Pollution Control District permit limitations.

2.6.1.4. Building 854 OU Facility Sampling Plan Evaluation and Modifications

The Building 854 OU facility sampling and analysis plan complies with CMP monitoring requirements. The sampling and analysis plan is presented in Table 2.6-6.

2.6.1.5. Building 854 OU Treatment Facility and Extraction Wellfield Modifications

There were no treatment facility or extraction wellfield modifications made in OU 6 during the reporting period.

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 delineates and 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: fifteen required analyses were not performed because there was insufficient water in the wells to collect the samples. A ground water elevation contour map for the $Tnbs_1/Tnsc_0$ HSU is presented in Figure 2.6-2. Ground water elevations are posted for the Qls and $Tnbs_1$ HSUs on Figure 2.6-4.

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 are summarized in Tables 2.6-8 through 2.6-10. The total mass removed during this 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, VOCs are the primary COCs detected in ground water; perchlorate and nitrate are the secondary COCs. These COCs have been identified primarily in the $Tnbs_1/Tnsc_0$ HSU.

Total VOC isoconcentration data for the $Tnbs_1/Tnsc_0$ HSU based on samples collected during the first semester 2009 are contoured and presented on Figure 2.6-2. A map showing total VOC concentrations for the Qls and $Tnbs_1$ HSUs is presented on Figure 2.6-3. Isoconcentration contour maps for the secondary COCs will be presented next semester in the 2009 Annual CMR report.

2.6.3.2.1. Total VOC Contaminant Concentrations and Distribution

The maximum first semester 2009 concentration of total VOCs in $Tnbs_1/Tnsc_0$ HSU ground water was 120 µg/L (W-854-02, April 2009). TCE comprises all of the total VOCs observed in ground water at Building 854, except for low cis-1,2-DCE concentrations detected in samples from wells W-854-17 and W-854-2139. The maximum cis-1,2-DCE ground water concentration detected during the first semester of 2009 was 1.8 µg/L (W-854-17, January 2009). Overall, total VOC concentrations in the $Tnbs_1/Tnsc_0$ HSU have decreased from a historic pre-remediation maximum of 2,900 µg/L (W-854-02, 1997). Two total VOC plumes exist in the $Tnbs_1/Tnsc_0$ HSU; a northern plume and a less extensive southern plume. The northern plume encompasses the 854-SRC and 854-PRX areas and is separated from the southern plume by a region where total VOC concentrations are below the 0.5 µg/L reporting limit (wells W-854-1902 and W-854-1822), as shown on Figure 2.6-3. The southern plume is in the vicinity of former water supply Well 13 (Figure 2.6-3). While the extent of total VOCs impacting Building 854 ground water with concentrations above the 0.5 µg/L reporting limit has remained relatively stable over time, since remediation began: (1) the portion of the northern VOC plume with concentrations greater than 50 µg/L has decreased and is currently limited to the immediate vicinity of the source area; (2) the extent of the northern total VOC plume with concentrations greater than 10 µg/L has decreased; and (3) the extent of the southern total VOC plume with concentrations greater than 5 µg/L has decreased significantly. Total VOCs were detected in shallow perched ground water in $Tnbs_1$ well W-854-10 located in the 854 source area during first semester 2009 at a maximum concentration of 17 µg/L. This is nearly identical to the second semester 2008 concentration of 16 µg/L, but a decrease from the first semester 2008 concentration of 34 µg/L. The long-term total VOC concentrations in this well exhibit a slightly increasing trend.

2.6.3.2.2. Perchlorate Contaminant Concentrations and Distribution

The maximum first semester 2009 perchlorate concentration in $Tnbs_1/Tnsc_0$ HSU ground water was 17 µg/L (W-854-1823, May 2009). The previous historic maximum concentration (27 µg/L, W-854-1823) was detected in 2003. Well W-854-1823 is located downgradient of the 854-PRX.

Overall, the distribution and concentrations of perchlorate in ground water are nearly identical to those observed last semester. Perchlorate was not detected during the first semester 2009 in samples from any Qls or $Tnbs_1$ wells.

2.6.3.2.3. Nitrate Contaminant Concentrations and Distribution

The maximum first semester 2009 nitrate concentration in $Tnbs_1/Tnsc_0$ HSU ground water was 53 mg/L (W-854-02, April 2009). During the first semester of 2009, nitrate was detected above the 45 mg/L cleanup standard in samples from two additional $Tnbs_1/Tnsc_0$ HSU extraction wells, W-854-03 (854-PRX) and W-854-2218 (854-SRC), and one $Tnbs_1/Tnsc_0$ monitoring well, W-854-09. Additionally, during the first semester 2009, nitrate was detected above the cleanup standard in samples from Qls well W-854-05 (60 mg/L, May 2009) upgradient of the 854 TCE source area and $Tnbs_1$ well W-854-14 (270 mg/L, May 2009) located near Building 858. Well W-854-14 had the maximum historic nitrate detection in the Building 854 OU. The continued presence of elevated nitrate in samples from this well could be due to impact from the

Building 858 septic system. Geochemical data (nitrogen and oxygen isotopes) collected in the Building 854 OU as part of the Site 300 nitrate MNA study indicated some evidence of *in situ* denitrification in the Neroly Formation ground water. The distribution of $Tnbs_1/Tnsc_0$ nitrate in the distal area remains low and essentially unchanged since this study.

2.6.3.3. Building 854 OU Remediation Optimization Evaluation

Since the 2006 expansion of the 854-SRC GWTS wellfield, the total volume of extracted ground water and contaminant mass removed has increased significantly. Ground water extraction continues to adequately capture the highest VOC concentrations. Well W-854-2218 can be pumped at a higher yield and future optimization efforts at 854-SRC will include increased pumping of this extraction well. Increased pumping would add to the total volume of 854-SRC effluent discharged. The effluent is currently discharged via misting towers, which are at or near capacity. Discharge of additional effluent volume would be accommodated by injection of treated effluent into an upgradient injection well. This injection well may be drilled in 2010. The slight increase in total VOC concentrations in $Tnbs_1$ monitoring well W-854-10 will continue to be monitored closely. If concentrations continue to increase, this well may be considered for conversion to an 854-SRC extraction well.

854-SRC SVTS ran throughout the first semester of 2009, except for intermittent periods offline resulting from high-temperature interlock alarms. The maximum historic TCE vapor concentration measured from well W-854-1834 was 4.4 $ppm_{v/v}$ (November 2005). The maximum first semester 2009 TCE vapor concentration measured from well W-854-1834 was 0.47 $ppm_{v/v}$ (April 2009). During the first semester of 2009, 0.48 kg of VOC vapor mass were removed, as compared to 0.61 kg during the second semester of 2008. Significant VOC mass continues to be removed from the source area due to relatively high vapor flow rates. This VOC mass is likely volatilizing from vadose zone sources beneath the 854 Source area and VOC vapors from the underlying dissolved VOC plume in $Tnbs_1/Tnsc_0$ ground water. Operation of the 854-SRC SVTS will continue until vapor concentrations decline below reporting limits, even after extended shutdown periods. At that time, the 854-SVTS will enter a period of testing specified by SVE system shutdown criteria.

Construction activities for full-time operation of 854-PRX were completed in September 2007, increasing overall extraction capacity and the extraction flow rate from well W-854-03 to 1.4 gpm. Although full-time operations have resulted in larger volumes of extracted water from well W-854-03, the stabilized pumping water level in this well remains more than 10 ft above the top of the well screen interval. This indicates that well W-854-03 can sustain even higher long-term flow rates without excessive drawdown. However, increasing the flow at this facility may exceed the capacity of the nitrate biotreatment unit and injection trench. Different treatment options are being evaluated to increase pumping from well W-854-03, including misting any excess ground water that exceeds the capacity of the nitrate biotreatment unit. Downgradient of 854-PRX, perchlorate has been detected at concentrations as high as 26 µg/L in ground water samples from monitor well W-854-1823. Perchlorate-contaminated ground water in the vicinity of well W-854-1823 is outside the footprint of the TVOC plume and is not currently being captured by the well W-854-03 extraction well. An *in situ* microcosm test is planned during the second semester of 2009. This test will evaluate treatment options for the *in situ* bioremediation of perchlorate and is being conducted to address a recommendation in the 2008 Five-Year Review report for the Building 854 Operable Unit to evaluate options for *in situ* bioremediation of perchlorate concentrations exceeding the 6 µg/L ground water cleanup standard in the vicinity of well W-854-1823. A summary of the microcosm test results will be included in the second semester 2009 (Annual) CMR report.

The single extraction well at the 854-DIS GWTS (W-854-2139) pumps at a low average rate of approximately 750 gallons per month because of cyclic pumping from the well, which cannot sustain prolonged pumping without excessive drawdown.

2.6.3.4. Building 854 OU Remedy Performance Issues

Although there were no new issues that affect the performance of the cleanup remedy for the Building 854 OU during this reporting period, the above ground limitations at 854-SRC and 854-PRX continue to limit the performance of the extraction wellfields. 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

Building 832 Canyon facilities were used to test the stability of weapons and associated components under various environmental conditions. Contaminants were released from Buildings 830 and 832 through piping leaks and surface spills during testing activities at these buildings.

Three GWTSs and two SVTS 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 monitoring and extraction wells and treatment facilities is presented in Figure 2.7-1.

The 832-SRC GWTS removes VOCs and perchlorate from ground water and the SVTS removes VOCs from soil vapor. The GWTS and SVTS began operation in September and October 1999, respectively. Initially, ground water was extracted from nine wells at a combined total flow rate that initially ranged from 30 to 300 gallons per day (gpd). The total flow eventually dropped to 5 to 50 gpd due to lowering of the water table by pumping. In early 2005, the source area extraction wellfield was reduced to two wells (W-832-12 and W-832-15) operating with vacuum enhancement and a combined flow rate ranging from 60 to 220 gpd. In late 2005, the extraction wellfield was expanded to include three additional downgradient wells (W-832-01, W-832-10, and W-832-11). As a result, the combined flow rate increased to about 1,300 gpd, and VOC concentrations in facility influent increased four-fold. Well W-832-25 was connected to the facility in July 2006. Currently, ground water is extracted from wells W-832-01, W-832-10, W-832-11, W-832-12, W-832-15 and W-832-25 at an approximate combined flow rate of 0.16 gpm. Soil vapor is extracted from wells W-832-12 and W-832-15 at an approximate combined flow rate of approximately 3.0 to 4.4 scfm. The current GWTS configuration includes a Cuno filter for particulate filtration, two ion-exchange columns with SR-7 resin 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 manifolded piping. 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 from the San Joaquin Valley Unified Air Pollution Control District.

The 830-SRC GWTS removes VOCs and perchlorate from ground water and the SVTS removes VOCs from soil vapor. The GWTS and SVTS began operation in February and May 2003, respectively. Ground water was extracted from four wells at a total flow rate ranging from 5 to 100 gpd. The 830-SRC extraction wellfield was expanded in 2006. Seven GWTS extraction wells (W-830-49, W-830-1829, W-830-2213, W-830-2214, W-830-57, W-830-60, and W-830-2215) were added to the original three (W-830-1807, W-830-19, and W-830-59). The expansion well testing began during 2006. The tests were completed and the expanded wellfield was in full operation during the first semester 2007. The 830-SRC GWTS is currently extracting ground water at a combined flow rate of approximately 5 to 7 gpm. The GWTS configuration includes a Cuno filter for particulate filtration, two ion-exchange columns with SR-7 resin connected in series to remove perchlorate, and three in series aqueous-phase GAC units 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. The 830-SRC soil vapor extraction wellfield was also expanded to include well W-830-49 in 2006. Soil vapor is extracted from wells W-830-1807 and W-830-49 using a liquid ring vacuum pump at a current combined flow rate of approximately 30 to 33 scfm. 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 from the San Joaquin Valley Unified Air Pollution Control District.

The 830-DISS GWTS began operation in July 2000 removing VOCs, perchlorate, and nitrate from ground water. Approximately 1 gpm of ground water was extracted from three wells (W-830-51, W-830-52, and W-830-53) using natural artesian pressure. The GWTS configuration consisted of a Cuno filter for particulate filtration, two aqueous-phase GAC units in series to remove VOCs, two in series ion-exchange columns with SR-7 resin to remove perchlorate, and three bioreactor units for nitrate reduction. These units were open-container wetland bioreactors containing microorganisms that use nitrate during cellular respiration. Acetic acid was added to the process stream as a carbon source. Treatment system effluent was discharged via a storm drain that discharges to the Corral Hollow alluvium. At the request of the Regional Water Quality Control Board, the facility was modified during the first semester 2007 to cease discharge of treated water to a surface water drainage way. The modification included the addition of a fourth well, W-830-2216, to the extraction wellfield. The GWTS is now extracting ground water at a combined flow rate of approximately 2 to 3 gpm. Currently, extracted ground water flows through ion-exchange canisters to remove perchlorate at the 830-DISS location. The water is then piped to the Central GSA GWTS 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

The 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 are shown 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 and operational issues interrupted continuous operations of the 832-SRC GWTS and SVTS, 830-SRC GWTS and SVTS, and 830-DISS GWTS during first semester 2009:

<u>832-SRC GWTS and SVTS</u>

- Extraction wells W-832-01, W-832-10, W-832-11, and W-832-25 were turned off from December 9, 2008 to February 23 to prevent freeze damage. The pipeline to well W-832-25 had a small leak and was shut down until February 24 for repairs.
- The ion-exchange resin was replaced on February 9.
- A site-wide power outage at Site 300 occurred on April 23, as a result, the GWTS and SVTS were shut down and secured to prevent facility damage and/or compliance issues when the power was restored. When the system was restarted on April 27, it was discovered that the computer program in Programmatic Logic Control was lost. The program was reloaded on June 3 and testing continued into the second semester.

<u>830-SRC GWTS and SVTS</u>

- Extraction wells W-830-19, W-830-59, W-830-1829, W-830-2213, and W-830-2214 were turned off on December 9, 2008 due to freezing temperatures. Extraction wells W-830-1807, -2215, -49, -57, and -60 remained running. However, W-830-2215, -57, and -60 were discovered to be offline on December 29, 2008, due to a controller problem, but were brought back on-line on January 13 after repairs were made. Extraction well W-830-59 was restarted on January 20, while W-830-19 was kept offline until February 25 due to low yield and continued cold weather. Extraction wells W-830-1829, and W-830-2213 remained off due to lack of water. The pump in extraction well W-830-2214 failed upon attempted restart at the end of January and is scheduled to be replaced during the second semester 2009. The pump in extraction well W-830-2215 failed during the first quarter 2009 and was replaced during the second quarter 2009. The well will be restarted early second semester.
- A GAC change out was performed on January 27.
- A small pinhole leak was discovered in the pipeline from extraction well W-830-49 on March 16. The leak was repaired and the pump was restarted on March 17.

- The GWTS and STS were found to be without power on March 23 due to a tripped transformer on the power pole. Power was restored and the facility was restarted on March 24.
- The pump in extraction well W-830-49 started failing on April 22 and the water in the well was upconing due to the vacuum. The vacuum to this well was closed off to prevent further upconing. The pump finally failed on May 13 and the well remained offline for the remainder of the semester.
- The pump in extraction well W-830-60 failed during the first quarter 2009 and was replaced during the second quarter 2009. The well will be restarted early second semester 2009.

<u>830-DISS GWTS</u>

- Extraction well W-830-2216 was shut down from December 11, 2008 to January 13 to protect against freeze damage.
- The GWTS was shut down on February 12 due to the Central GSA treatment system shutdown and operated intermittently until the issues at the Central GSA were resolved on March 2.
- The perchlorate resin was changed on May 19.

2.7.1.3. Building 832 Canyon OU Compliance Summary

The 830-SRC, 832-SRC, and 830-DISS GWTSs operated in compliance with Substantive Requirements during the reporting period. The 830-SRC and 832-SRC SVTSs operated in compliance with the San Joaquin Valley Unified 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 CMP monitoring requirements. The sampling and analysis plan is presented in Table 2.7-6. No modifications were made to the plan during this reporting period.

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

There were no treatment facility or wellfield modifications in OU 7 during the reporting period.

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; forty-five required analyses were not performed because there was insufficient water in the wells to collect the samples and six required analyses were not performed due to an inoperable pump.

Ground water elevation data are posted for the Qal/WBR and $Tnsc_{1a}$ and contoured for $Tnsc_{1b}$ and Upper $Tnbs_1$ HSUs as presented in Figures 2.7-2, 2.7-4, 2.7-3, and 2.7-5, respectively. The ground water elevation maps also show hydraulic capture zones for the extraction wells that were active during second semester.

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 are summarized in Tables 2.7-8 through 2.7-10. The total masses removed during this 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 (mainly TCE) are the primary COCs detected in ground water; perchlorate and nitrate are the secondary COCs. These constituents have been identified primarily in the $Tnsc_{1a}$, $Tnsc_{1b}$ and Qal/WBR HSUs. Total VOCs have also been detected in low concentrations in the $Tnbs_2$ and Upper $Tnbs_1$ HSUs.

Total VOC isoconcentration data are posted for the Qal/WBR and $Tnsc_{1a}$ and contoured for the $Tnsc_{1b}$ and Upper $Tnbs_1$ HSUs, as presented on Figures 2.7-6, 2.7-8, 2.7-7, and 2.7-9, respectively. Isoconcentration contour maps for the secondary COCs will be presented next semester in the 2009 Annual CMR report.

2.7.3.2.1. Total VOC Contaminant Concentrations and Distribution

Total VOC concentrations in ground water in the Qal/WBR HSU have decreased from a historic maximum of 10,000 µg/L (SVI-830-035) in 2003 to a first semester 2009 maximum concentration of 610 µg/L (SVI-830-035). Historically, ground water samples from wells located in the Building 830 source area have contained the highest total VOC concentrations in the Qal/WBR HSU. Total VOC concentrations in ground water samples taken from Qal/WBR HSU guard wells located south of Building 832 Canyon near the Site 300 southern boundary continue to be low (<1 µg/L) to below reporting limits (<0.5 µg/L) and have decreased from a historic maximum of 2.0 µg/L (W-6BS) in 2001 to 0.8 µg/L (W-35B-01) in the first semester 2009. A total VOC concentration of less than the reporting limit is shown on Figure 2.7-6 for guard well W-35B-01 because that concentration was sampled during the first quarter when most other OU7 Qal/WBR HSU samples were collected.

A significant reduction in total VOC concentrations in both ground water and vapor has also been achieved in the Building 832 source area since remediation began in this area in 1999. Total VOC concentrations in wells screened in the Qal/WBR have decreased from a historic maximum of 1,800 µg/L (W-832-18) in 1998 to a first semester 2009 maximum concentration of 460 µg/L (W-832-23). Monitor well W-832-23 is used to constrain plume concentrations in both the Qal/WBR and $Tnsc_{1b}$ HSUs, since it is screened across both intervals.

Overall, ground water yield continues to be low in the Building 832 source area. The area has been almost completely de-saturated due to ongoing ground water extraction and limited rainfall. As a result, ground water samples (for VOC analyses) were not collected from several

Qal and $Tnsc_{1b}$ HSU wells because the water table has dropped below the screen bottom in these wells. Nevertheless, due to the effectiveness of expansion extraction wells W-832-01, W-832-10, and W-832-11, the extent of the total VOC concentrations in the 832-SRC area appears to have decreased slightly. Total VOC concentrations in soil vapor have declined from a historic maximum of 1.8 $ppm_{v/v}$ in September 2001 to a maximum of 0.067 $ppm_{v/v}$ in March 2009. This soil vapor sample was collected during a period of continuous operation.

Since remediation began in the Building 830 source area in 2000, a significant reduction in total VOC concentrations in ground water has also been achieved in the $Tnsc_{1b}$ HSU. Total VOC concentrations in $Tnsc_{1b}$ HSU ground water have decreased by an order-of-magnitude from a historic maximum of 13,000 µg/L (W-830-49) in 2003 to a first semester 2009 maximum of 4,300 µg/L (W-830-19). Nevertheless, the overall extent of VOCs in the $Tnsc_{1b}$ HSU has not changed significantly over the past several years because hydraulic capture has been limited by limited recharge and low ground water yields. Total VOC concentrations in soil vapor in the Building 830 source area have declined from a historic maximum of 259 $ppm_{v/v}$ in well W-830-49 (April 2007) to a maximum of 46 $ppm_{v/v}$ (May 2009). This soil vapor sample was collected after a period of extended shutdown and a soil vapor sample collected from this well in March 2009 was 0.006 $ppm_{v/v}$.

Due to operational issues such as freezing temperatures and extraction well pump failures, the 830-SRC groundwater and soil vapor treatment facilities did not operate at full capacity during the first semester 2009. This downtime had minor impacts on the overall extent of the total VOC plume in the $Tnsc_{1b}$ HSU near the Building 830 source area. It also decreased the total VOC mass removed. Efforts continue to minimize extraction well downtime, and short-term shutdowns are not expected to impact long-term cleanup goals.

Total VOC concentrations in $Tnsc_{1b}$ HSU artesian wells W-830-51, W-830-52, and W-830-53, located farther south along Building 832 Canyon, have also decreased from a historic maximum of 170 µg/L in 2002 to a first semester 2009 maximum concentration of 37 µg/L (W-830-51). The leading edge of the $Tnsc_{1b}$ VOC plume continues to be contained within Site 300 based on total VOC concentrations below the 0.5 µg/L reporting limit in $Tnsc_{1b}$ HSU guard wells W-830-1730 and W-4C. Due to an inoperable pump, guard well W-880-03 was not sampled during the first semester 2009. The pump is scheduled for repair later this year.

Remediation of the $Tnsc_{1a}$ HSU began with the 830-SRC wellfield expansion in early 2007. As a result, total VOC concentrations in $Tnsc_{1a}$ HSU ground water have decreased by one order-of-magnitude from a historic maximum of 1,700 µg/L (W-830-27) in 1998 to a first semester 2009 maximum concentration of 600 µg/L (W-830-27). Due to an inoperable pump, extraction well W-830-2214 was not sampled during the first semester 2009. The pump is scheduled for repair later this year. Monitor well W-830-2311, which is located near Spring 3, was installed in 2007 as a $Tnsc_{1a}$ HSU guard well to evaluate the downgradient extent of VOCs. The highest total VOC concentration sampled in this well during the first semester 2009 was 28 µg/L (March 2009). A new $Tnsc_{1a}$ HSU guard well, located downgradient of well W-830-2311 near the southern site boundary is planned for 2010.

Since remediation began in the upper $Tnbs_1$ HSU, total VOC concentrations in ground water have decreased from a historic maximum concentration of 100 µg/L (W-830-28, June 1998) in 1998 to a first semester 2009 maximum concentration of 32 µg/L (extraction well W-830-60). The spatial extent of total VOCs in the Upper $Tnbs_1$ has also declined since remediation began.

Total VOCs were not detected above the 0.5 µg/L reporting limit in Upper $Tnbs_1$ guard wells W-830-20 and W-832-2112 during the first semester 2009. Well W-830-15, located even farther downgradient of the guard wells (near the southern end of the Building 832 Canyon), also remains below the reporting limit for total VOCs. The continued absence of total VOCs in these downgradient monitor wells suggests that the Upper $Tnbs_1$ extraction wellfield is adequately capturing the VOC plume in this HSU.

2.7.3.2.2. HE Compound Concentrations and Distribution

During the first semester of 2009, HE compounds (RDX, HMX, 2-amino-4,6-dinitrotoluene, and nitrobenzene) were not detected in ground water in any Building 832 Canyon OU wells. During 2008, HE compounds were detected above their respective reporting limits in only one OU 7 well. On August 5, 2008, HMX was detected in ground water in guard well W-880-01 at a concentration of 540 µg/L. This $Tnbs_2$ HSU well is located at the southern end of the Building 832 Canyon near the site boundary. It was re-sampled for HE compounds during the first semester 2009; however, because the sample did not meet LLNL sampling criteria, the sample was rejected. Previous samples for HMX at this location have always been below the reporting limit and the well will be re-sampled for HE compounds during the second semester 2009.

2.7.3.2.3. Perchlorate Concentrations and Distribution

The maximum perchlorate concentrations detected in Qal/WBR HSU ground water have decreased from a historic maximum concentration of 51 µg/L in well W-830-34 (December 1998) to a first semester 2009 maximum concentration of 18 µg/L (February 2009) in monitor well W-832-13. The maximum perchlorate concentration measured in ground water from W-832-23 during the first semester 2009 was 16 µg/L. Monitor well W-832-23 is used to constrain plume concentrations in both the Qal/WBR and $Tnsc_{1b}$ HSUs, since it is screened across both intervals. The well is located slightly downgradient of the Building 832 source area. Perchlorate was not detected above the 4 µg/L reporting limit in Qal/WBR guard wells W-35B-01 and W-880-02 during the first semester 2009.

Due to the effectiveness of the extraction wellfield, the extent of perchlorate above 6 µg/L in the $Tnsc_{1b}$ HSU (Figure 2.7-11) has decreased significantly over the past year. The maximum perchlorate ground water concentration sampled in the $Tnsc_{1b}$ HSU during the first semester 2009 was 18 µg/L (W-832-13, February 2009). Historically, well W-830-58 has contained ground water with the highest perchlorate concentration in this HSU (26 µg/L, May 2001). Perchlorate was not detected above the 4 µg/L reporting limit in any $Tnsc_{1b}$ guard wells during the first semester 2009. However, due to an inoperable pump, guard well W-880-03 was not sampled during the first semester 2009; the pump will be replaced later this year.

The maximum perchlorate ground water concentration sampled in the $Tnsc_{1a}$ HSU during the first semester 2009 was 8.3 µg/L (W-832-25, February 2009). The highest historic perchlorate concentration in the $Tnsc_{1a}$ HSU was 13 µg/L (W-832-25, February 1999).

Perchlorate was not detected above the reporting limit of 4 µg/L from any ground water samples taken from the Upper $Tnbs_1$ HSU during the first semester 2009.

2.7.3.2.4. Nitrate Concentrations and Distribution

Nitrate ground water concentrations continue to be high in the vicinity of the Building 832 and 830 source areas and remain low to below the reporting limit (<0.5 mg/L) in the downgradient, deeper parts of all Building 832 Canyon HSUs.

During the first semester 2009, nitrate ground water concentrations detected in samples from the Qal/WBR HSU ranged from <1 mg/L (guard wells) near the site boundary to 200 mg/L (SVI-830-033, March 2009) in the Building 830 source area.

Nitrate ground water concentrations detected in samples from the $Tnsc_{1b}$ HSU ranged from <0.5 mg/L to 220 mg/L (W-830-49, January 2009). Historically, well W-830-49 has contained the highest nitrate concentrations in the $Tnsc_{1b}$ HSU (501 mg/L, June 1998). Nitrate concentrations in the $Tnsc_{1b}$ guard wells ranged from <0.5 mg/L to 2 mg/L (W-830-1730, March 2009), well below the 45 mg/L cleanup standard. Due to an inoperable pump, guard well W-880-03 was not sampled during the first semester 2009; the pump is scheduled for replacement later this year.

During the first semester 2009, the maximum nitrate ground water concentration detected in samples from the $Tnsc_{1a}$ HSU was 110 mg/L (W-832-25, February 2009). Nitrate ground water concentrations detected in samples from the Upper $Tnbs_1$ ranged from <0.5 mg/L to 26 mg/L (W-26R-01, February 2009). Nitrate ground water concentrations in guard wells in Upper $Tnbs_1$ HSU were not detected above the reporting limit. The very low nitrate concentrations in the down gradient areas and the absence of detectable nitrate in the southern site boundary guard wells are consistent with the interpretation that nitrate is naturally attenuating *in situ*.

2.7.3.3. Building 832 Canyon OU Remediation Optimization Evaluation

Ground water and soil vapor extraction wellfield optimization continued during the first semester 2009 to prevent offsite plume migration, reduce source area concentrations, and increase mass removal. The expanded 832-SRC and 830-SRC extraction wellfields have increased hydraulic capture, while preventing the downward migration of contaminants into deeper HSUs or laterally toward the site boundary and Site 300 water-supply wells 18 and 20.

Ground water yield continues to be low from many 830-SRC and 832-SRC extraction wells and hydraulic capture is difficult to assess because these wells cannot maintain continuous operation. The low yield is due to a combination of low hydraulic conductivity geologic materials, dewatering, and limited recharge.

COC concentrations in the Building 830 and Building 832 source areas generally exhibit decreasing trends. Since remediation began, the maximum total VOC concentrations have decreased significantly in both the $Tnsc_{1b}$ and Qal/WBR HSUs. COC concentrations have also decreased in the Upper $Tnbs_1$ HSU, but remain stable in the $Tnsc_{1a}$ HSU. Active remediation of the $Tnsc_{1a}$ HSU began in 2007.

During the first semester 2009, remediation in the Building 832 Canyon OU was hampered by operational problems at both the Building 830 and Building 832 source areas (detailed in Section 2.7.1.2). These problems were the result of freezing temperatures, a number of 830-SRC extraction well pump failures, and a side-wide power outage that caused both the B832-SRC GWTS and SVTS to be taken offline. These short-term shutdowns led to a decrease in the total VOC mass removed, but appear to have had little impact on the size and shape of any

Building 832 contaminant plume. Long-term cleanup goals are not expected to impacted and LLNL engineers are working to get these facilities back online.

The $Tnsc_{1b}$ HSU extraction wells target the highest total VOC plume concentrations emanating from the two source areas. Nevertheless, steep terrain and unstable canyon bottom soil conditions have limited the installation of additional OU7 extraction wells. Ground water extraction has also been hampered by limited recharge and declining water levels in both source areas. Due to limited water, extraction wells W-830-1829 and W-830-2213 did not operate during the first semester 2009. Both wells will be converted to monitor wells later this year. Dual-phase extraction well W-830-49 is also offline due to a failed pump. The pump is scheduled to be replaced later this calendar year.

Two extraction wells are currently active in the $Tnsc_{1a}$ HSU: W-830-2214 is located near the 830-SRC treatment facility and W-832-25 is located downgradient of 832-SRC treatment facility in the distal area of this plume. W-830-2214 is not currently operating due to a failed pump, which will be replaced later this year. W-832-25 is also not operational at this time. During the short time the $Tnsc_{1a}$ HSU has been under remediation, total VOC concentrations have remained relatively stable. Water supply continues to decline in both the 830-SRC and 832-SRC areas, limiting continuous extraction from the $Tnsc_{1a}$.

Extraction wells in the Upper $Tnbs_1$ target areas with the highest total VOC concentrations. Monitor well W-830-1832, which is located on the leading edge of the VOC plume, displayed increasing total VOC concentrations prior to activation of the 830-SRC GWTS. Following activation of the GWTS, total VOC concentrations in this well have generally declined. Ground water in Upper $Tnbs_1$ guard wells, which are located downgradient of W-830-1832 and upgradient of water-supply Well 20, continue to show analytical results below the reporting limit for all COCs. Decreasing COC concentrations downgradient of the 832-SRC and 830-SRC extraction wellfields and the continued absence of COCs in guard wells demonstrate the effectiveness of the extraction wellfield in removing mass and reducing the migration of contaminants.

As extraction from the 832-SRC, 830-SRC and 830-DISS extraction wells proceeds, it is expected that concentrations in all identified OU 7 HSUs will continue to decline. Over the past year, the extent of the Upper $Tnbs_1$ total VOC plume has decreased slightly and this trend is expected to persist with continued pumping. Total VOC concentration trends in the Upper $Tnbs_1$ continue to be carefully monitored due to the potential influence of pumping at water-supply Well 20 and backup water-supply Well 18.

2.7.3.4. Building 832 Canyon OU Remedy Performance Issues

With the exception of declining water levels in the Building 832 source area, no 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 be effective and protective of human health and the environment, and to make progress toward cleanup.

2.8. Site 300 Site-Wide OU 8

The Site 300 Site-Wide OU is comprised of release sites at which no significant ground water contamination and no unacceptable risk to human health or the environment are present. For this reason, a monitoring-only 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 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, landfill, monitor wells, ground water elevations, and approximate ground water flow direction is presented in Figure 2.8-1.

2.8.1.1. Building 801 and Pit 8 Landfill Ground Water Monitoring

Wells K8-01 and K8-03B monitor Building 801 ground water contaminants while wells K8-02B, K8-04, and K8-05 are detection monitoring wells for 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. This table delineates 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; ten required analyses were not performed because there was insufficient water in the wells to collect the samples.

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

Wells K8-01 and K8-03B monitor Building 801 ground water contaminants while wells K8-02B, K8-04, and K8-05 are detection monitoring wells for 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. This table delineates 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; ten required analyses were not performed because there was insufficient water in the wells to collect the samples.

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

At Building 801, VOCs are the primary COCs detected in ground water; perchlorate and nitrate are the secondary COCs. There are no COCs in ground water at the Pit 8 Landfill. The results of the detection monitoring of the Pit 8 Landfill are discussed in Section 3.2.

Total VOC data are posted for the $Tnbs_1$/$Tnbs_0$ HSU as presented on Figure 2.8-1. Isoconcentration contour maps for the secondary COCs at Building 801 will be presented next semester in the 2009 Annual CMR report.

During the first semester 2009, the maximum total VOC concentration detected in ground water samples from wells in the Building 801/Pit 8 Landfill area was 7.0 µg/L (K8-01, May 2009). This total VOC concentration was comprised of 4.7 µg/L of TCE and 2.3 µg/L of

1,2-DCA. A duplicate sample collected from well K8-01 had a total VOC concentration of 5.3 µg/L comprised of 3.8 µg/L of TCE and 1.5 µg/L of 1,2-DCA. Total VOC concentrations detected in ground water samples collected from wells downgradient of Building 801 have decreased from a historic maximum of 10 µg/L at K8-01 in 1990.

During the first semester 2009, perchlorate was only detected in a duplicate sample from well K8-01 at 4.3 µg/L (May 2009). The other sample from well K8-01 and all the ground water samples from the other Building 801/Pit 8 monitor wells did not contain perchlorate above the 4 µg/L reporting limit.

Nitrate concentrations in ground water in the Building 801/Pit 8 Landfill area have been fairly stable over time. The first semester 2009 maximum nitrate concentration detected in a ground water sample from a well in the Building 801/Pit 8 Landfill area was 61 mg/L (K8-04, May 2009). The sample from well K8-04 was the only one that exceeded the 45 mg/L cleanup standard. The historic maximum nitrate concentration of 64 mg/L was detected in samples collected from well K8-01 in 2002. Overall, nitrate concentrations in ground water at the Building 801/Pit 8 Landfill generally are similar to previous years.

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, monitoring wells, and ground water elevations is presented in 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. This table delineates 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; six required analyses were not performed because there was insufficient water in the wells to collect the samples.

2.8.2.2. Building 833 Contaminant Concentrations and Distribution

At Building 833, VOCs are the primary COC in ground water; there are no secondary COCs. Total VOC concentrations in the Tpsg HSU are presented on Figure 2.8-2.

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 little evidence of saturation. When saturated, monitoring conducted from 1993 to 2009 has shown a decline in total VOC concentrations in Tpsg HSU ground water from a historic maximum concentration of 2,100 µg/L in 1992 (W-833-03). During the first semester 2009, none of the Tpsg wells contained sufficient water for sampling. VOCs were not detected in the first semester 2009 sample from deep $Tnbs_1$ HSU monitoring well W-833-30, indicating that VOC contamination continues to be confined to the shallow Tpsg perched water-bearing zone.

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, monitoring wells, ground water elevations, and approximate hydraulic gradient direction in the $Tnsc_0$ HSU are presented in Figure 2.8-3.

2.8.3.1. Building 845 and Pit 9 Landfill Ground Water Monitoring

Wells K9-01 through K9-04 are detection monitoring wells for the Building 845 and Pit 9 Landfill. Detection monitoring of this landfill, which is discussed in Section 3.3, is conducted to determine if releases have occurred.

The sampling and analysis plan for ground water monitoring is presented in Table 2.8-3. This table delineates any additions made to the CMP.

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

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

There are no COCs in ground water at Building 845 and the Pit 9 Landfill. The monitoring wells near the Pit 9 Landfill are screened in the lower Neroly Formation $Tnsc_0$ HSU. Detection monitoring of the Pit 9 landfill, which is discussed in Section 3.3, is conducted to determine any releases to ground water.

No COC concentrations maps are provided for the Building 845 and Pit 9 Landfill area as there continues to be no contamination detected in the ground water.

2.8.4. Building 851 Firing Table

The Building 851 Firing Table has been used since 1962 to conduct explosives experiments. A map showing the locations of the firing table, monitoring wells, and ground water elevations is presented in 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. This table delineates any additions made to the CMP.

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

2.8.4.2. Building 851 Contaminant Concentrations and Distribution

At the Building 851 Firing Table, uranium is the primary COC detected in ground water; tritium is the secondary COC. Total uranium activities and $^{235}U/^{238}U$ isotope atom ratios are presented on Figure 2.8-4. Tritium activities will be presented next semester in the 2009 Annual CMR. Wells W-851-05, W-851-06, and W-851-07 are completed in the Tmss HSU. Well W-851-08 is completed in the overlying $Tnsc_0$ HSU.

The first semester 2009 maximum total uranium activity detected in ground water samples from wells in the Building 851 area was 1.1 pCi/L (W-851-08, May 2009). The historic maximum uranium activity was 3.2 pCi/L (W-851-07, October 1991). The atom ratio of $^{235}U/^{238}U$ in samples from wells W-851-05, W-851-06, and W-851-08 indicated the addition of some depleted uranium. The sample from well W-851-07 contained only natural uranium. Overall, uranium activities in ground water are similar to previous years and remain well below the 20 pCi/L cleanup standard. During the first semester 2009, tritium activities were not detected above the 100 pCi/L reporting limit in ground water samples from any Building 851 monitoring wells. The maximum historic tritium activity detected in Building 851 ground water was 3,790 pCi/L (W-851-08, late 1998).

3. Detection Monitoring, Inspection, and Maintenance Program for the Pits 2, 8, and 9 Landfills

The Pit 2, 8, and 9 Landfills received firing table debris from the 1950s to the 1970s. At present, there is no evidence of contaminant releases to ground water from any of these three landfills, except for low activities of depleted uranium at the Pit 2 Landfill, and no unacceptable risk or hazard to human or ecological receptors has been identified. The Detection Monitoring Program is designed to detect any future releases of contaminants from these landfills. This section presents the results for the Pit 2, 8, and 9 Landfills ground water detection monitoring network, and any landfill inspections or maintenance that was conducted during the reporting period.

3.1. Pit 2 Landfill

3.1.1. Sampling and Analysis Plan Modifications

The sampling and analysis plan for the Pit 2 Landfill ground water Detection Monitoring Program are presented in Table 3.1-1. During the reporting period ground water monitoring was conducted in accordance with the CMP monitoring requirements, except that sixteen required analyses were not performed because there was insufficient water in the wells to collect the samples. There were no modifications made to the plan.

3.1.2. Contaminant Detection Monitoring Results

A map showing the locations of monitoring wells and the Pit 2 Landfill is presented on Figure 2.5-1.

The ground water elevation contour maps that include the Pit 2 Landfill are presented on Figures 2.5-2 and 2.5-3. Wells W-PIT2-2301 and W-PIT2-2302, completed in the Qal/WBR HSU immediately southeast of Pit 2, contained water in their screened intervals during the first semester 2009 and were sampled for tritium, uranium, and perchlorate. Depth to ground water within the $Tnbs_1/Tnbs_0$ HSU was measured at 56 ft to 73 ft beneath the Pit 2 Landfill.

A map of the first semester 2009 distribution of ground water tritium activity within the $Tnbs_1/Tnbs_0$ HSU and including the Pit 2 Landfill is presented on Figure 2.5-5. The maximum first semester 2009 tritium activity within the $Tnbs_1/Tnbs_0$ HSU in the area immediately south of the Pit 2 Landfill was 5,310 ± 540 pCi/L (K2-01C, January 2009). The historic maximum tritium activity was detected in 1986 (January and August) from well K2-01C (49,100 pCi/L). The data indicate that tritium activities in $Tnbs_1/Tnbs_0$ HSU ground water immediately downgradient of the landfill are decreasing and are currently a fraction of the historic maximum. Ground water samples were collected for the first time from Qal/WBR HSU wells W-PIT2-2301 and W-PIT2-2302, located in Elk Ravine downgradient from Landfill Pit 2. A map of the first semester 2009 distribution of ground water tritium activity within the Qal/WBR HSU and including the Pit 2 Landfill is presented on Figure 2.5-4. Tritium above the reporting limit/background activity (100 pCi/L) was not detected in the sample from W-PIT2-2302 and the tritium activity of the ground water sample from well W-PIT2-2301 was within the range of background (116 ± 53 pCi/L). Thus, it does not appear that tritium originating at Building 850 is present in the Qal/WBR HSU in Elk Ravine.

The maximum first semester 2009 uranium activity detected in a ground water sample from the Pit 2 area was 9.3 pCi/L (K2-01C, May 2009). First semester 2009 and previous uranium isotope data from Pit 2 $Tnbs_1/Tnbs_0$ HSU wells K2-01C, W-PIT2-1934, and W-PIT2-1935 indicate that the Pit 2 Landfill has added low activities of depleted uranium to the naturally-occurring uranium in the ground water. Also, uranium isotope data from initial ground water samples collected from Qal/WBR wells W-PIT2-2301 and W-PIT2-2302 in the first semester 2009 indicate the addition of low activities of depleted uranium from the Pit 2 Landfill.

The release of uranium from Pit 2 may have been the result of the discharge of potable water that was used to maintain a wetland habitat for red-legged frogs (a Federally-listed endangered species) within a drainage channel that extends along the northern and eastern margin of the Pit 2 Landfill. This discharge was discontinued in 2005. Since the discharge was discontinued, total uranium activities in ground water from wells W-PIT2-1934 and W-PIT2-1935, both located along the northern margin of the Pit 2 Landfill, have decreased.

During the first semester 2009, perchlorate was detected above the 4 µg/L reporting limit, but below the 6 µg/L cleanup standard, in ground water samples collected in January from wells K2-01C (4.1 µg/L) and NC2-08 (4.3 µg/L). The 4.1 µg/L result for well K2-01C was from a duplicate sample; perchlorate was not detected above the 4 µg/L reporting limit in the routine sample. Perchlorate was not detected above the 4 µg/L reporting limit in subsequent samples from these wells. In all other samples from wells in the Pit 2 Landfill area, including Qal/WBR wells W-PIT2-2301 and W-PIT2-2302, perchlorate was not detected above the 4 µg/L reporting limit.

No other constituents, including VOCs, nitrate, HE compounds, metals and fluoride that were monitored during the first semester 2009 at the Pit 2 landfill as part of the Detection Monitoring Program were detected in $Tnbs_1/Tnbs_0$ HSU ground water above regulatory limits.

3.1.3. Landfill Inspection Results

The Pit 2 Landfill was inspected quarterly during 2009. Two large burrows, possibly badger dens, were observed in the pit cap during the second quarter 2009 inspection.

3.1.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during the second semester 2009.

3.1.5. Maintenance

No maintenance was conducted on Pit 2 during the first semester 2009. The burrow repair is scheduled for next semester.

3.2. Pit 8 Landfill

3.2.1. Sampling and Analysis Plan Modifications

The sampling and analysis plan for the Pit 8 Landfill ground water Detection Monitoring Program are presented in Table 2.8-1. During the reporting period, ground water monitoring was conducted in accordance with the CMP monitoring requirements with the following exceptions; ten required analyses were not performed because there was insufficient water in the wells to collect the samples. There were no modifications made to the plan.

3.2.2. Contaminant Detection Monitoring Results

Ground water elevations and total VOC concentrations in $Tnbs_1/Tnbs_0$ HSU ground water are presented on Figure 2.8-1. Nitrate and perchlorate concentrations will be presented next semester in the 2009 annual CMR.

Historic and current data indicate that total VOCs detected in ground water in the Pit 8 Landfill area are the result of releases from the former Building 801 dry well, which have migrated downgradient from Building 801 to beneath the landfill. The highest concentration of total VOCs (1,2-DCA and TCE) continues to be observed at upgradient well K8-01 where a sample collected during the first semester 2009 contained 7.0 µg/L (May 2009). A duplicate sample contained 5.3 µg/L of total VOCs. The presence of total VOCs in a ground water sample from well K8-04, immediately downgradient of the Pit 8 Landfill, with a concentration of 2.4 µg/L (May 2009) appears to be a continuation of the VOC plume originating at the Building 801D dry well and is not due to a release from the Pit 8 Landfill. During the first semester 2009, 1,2-DCA was the only VOC detected above its cleanup standard (0.5 µg/L) with concentrations of 2.3 and 0.8 µg/L in samples from wells K8-01 and K8-04, respectively.

The first semester 2009 maximum nitrate concentration detected in a ground water sample from a well in the Pit 8 Landfill area was 61 mg/L (K8-04, May 2009) and was the only one that exceeded the 45 mg/L cleanup standard.

Tritium activities in all samples collected from wells in the Pit 8 Landfill area during the first semester 2009 were below the reporting limit (<100 pCi/L), except for a duplicate sample from well K8-01 (117 ± 56 pCi/L). The current results suggest that tritium from Building 850 is not impacting this area.

Fluoride, metals, uranium isotopes, and thorium-232 concentrations/activities in samples collected during the first semester 2009 from wells upgradient and downgradient of the Pit 8 Landfill were at or below background concentrations and below regulatory limits.

Of the constituents monitored during the first semester 2009 as part of the Detection Monitoring Program in $Tnbs_1/Tnbs_0$ HSU ground water from Pit 8 Landfill area wells, only 1,2-DCA and nitrate exceeded cleanup standards.

3.2.3. Landfill Inspection Results

The Pit 8 Landfill was inspected quarterly during 2009. No problems were reported in the first semester 2009.

3.2.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during the second semester 2009.

3.2.5. Maintenance

No maintenance was conducted at Pit 8 during the first semester 2009.

3.3. Pit 9 Landfill

3.3.1. Sampling and Analysis Plan Modifications

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 the CMP monitoring requirements. There were no modifications made to the plan.

3.3.2. Contaminant Detection Monitoring Results

All detection monitoring constituents including tritium, HE compounds, VOCs, fluoride, metals, uranium isotopes, and thorium-232 concentrations/activities in samples collected in the first semester 2009 from wells upgradient and downgradient of Pit 9 were at or below background concentrations and below regulatory limits.

During the first semester 2009, depth to ground water was approximately 110 feet beneath the Pit 9 Landfill. There were no significant changes in ground water elevations from previous semesters. Pit 9 Landfill ground water elevations are presented on Figure 2.8-3.

3.3.3. Landfill Inspection Results

The Pit 9 Landfill was inspected quarterly during the first semester 2009. Several deep animal burrows and some minor cracks were noted in the inspection reports.

3.3.4. Annual Subsidence Monitoring Results

Annual subsidence monitoring will be conducted during the second semester 2009.

3.3.5. Maintenance

Some maintenance of the pit cover, including filling of animal burrows, was conducted during the first semester 2009.

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.

4.1. Human Health Risk and Hazard Management

The CMP/CP requires that the risk and hazard associated with volatile contaminants in the subsurface migrating upward into indoor and outdoor ambient air and being inhaled by workers be re-evaluated annually using current data.

The on-site worker inhalation risk associated with vapor intrusion from the subsurface into indoor and outdoor air is discussed in Section 4.1.1. The onsite worker inhalation risk associated with Springs 3, 5, and 7 is discussed in Section 4.1.2.

4.1.1. Vapor Intrusion Inhalation Risk Evaluation

According to the CMP/CP, risk and hazard management will continue for buildings/areas where an unacceptable risk and/or hazard were previously identified until the estimated risk is below 10^{-6} and the hazard index is below 1 for two consecutive years. Risk and hazard management was ongoing during the reporting period for the following buildings:

- Building 834D
- Building 830
- Building 833

Risk evaluations for these buildings will be performed and reported in the annual report.

Institutional controls, such as restricting access to or activities in areas of elevated risk, remained in place during the reporting period to prevent unacceptable exposure to contaminants during remediation for those buildings that continue to show an unacceptable risk and/or hazard.

4.1.2. Spring Ambient Air Inhalation Risk Evaluation

The CMP requires annual sampling of outdoor air above contaminated surface water, when surface water is present to determine VOC concentrations. The following springs were evaluated during the first semester 2009:

- Ambient Air Near Spring 3 in the Building 832 Canyon OU
- Ambient Air Near Spring 5 in the HEPA OU
- Ambient Air Near Spring 7 in the Pit 6 Landfill OU

No surface water or green hydrophilic vegetation was present at Springs 5 and 7 during first semester 2009, therefore no ambient air VOC sampling was performed. Springs 5 and 7 have been devoid of surface water or green hydrophilic vegetation since monitoring began in 2003. These springs will be monitored for the presence of surface water or green hydrophilic vegetation in 2010 and air samples will be collected if water is present.

Ambient air samples were collected at Spring 3 during the first semester 2009. The results are presented in Table 4-1. Three collocated samples were collected, SPRING3-001, SPRING3-002, and SPRING3-003. Per the requirements of the CMP, the ambient air sample concentrations were compared to Industrial Air Regional Screening Levels for Chemical Contaminants at Superfund Sites. The Screening Levels represent a target risk of 1 x 10^{-6} and a hazard of 1.

PCE was detected in sample SPRING3-002 above the 0.31 ppb_v screening level. PCE was not detected above the screening level in the other two samples, therefore the detection of PCE was not confirmed.

Since no contaminants were detected above their respective screening levels in 2008 and the detection of PCE was not confirmed in 2009, the risk and hazard management is complete for

Spring 3. The estimated risk has remained below 10^{-6} and the hazard index has remained below 1 for two consecutive years. No risk or hazard to onsite workers exists.

4.2. Ecological Risk and Hazard Management

Surveys for important burrowing species are required in survey areas specified in the CMP as long as a potential ecological hazard is present. The CMP initially required surveys at Building 834, Pit 6 Landfill, and Building 850. As discussed in the 2005 Annual CMR, only Building 850 continues to present a potential ecological hazard.

4.2.1. Polychlorinated biphenyl (PCBs), Dioxins, and Furans in Surface Soil at 850

Due to the presence of PCBs, dioxins, and furans in the surface soil at Building 850, ecological field surveys have been conducted to determine the presence of important burrowing species. Figure 4.2.1 shows the ecological survey area for the Building 850 Firing Table. As reported in the 2004, 2005, 2006 and 2007 Annual and 2008 First Semester CMRs, wildlife surveys have revealed the presence of the Western burrowing owl in the area adjacent to the Building 850 Firing Table within the ecological survey area. As also previously reported, California tiger salamanders have been observed in breeding pools approximately 700 meters (the Mitigation Pond) and 1200 meters (Ambrosino Pool) to the north west of the survey area. No California tiger salamanders have been observed directly in the Building 850 ecological survey area.

Both western burrowing owls and California tiger salamanders fit the description of important burrowing species as defined in the CMP. Western burrowing owls are a State species of concern (California Department of Fish and Game, 2004). A preliminary exposure analysis for the Western burrowing owl to estimate hazard to cadmium and PCBs was completed and reported on in the First Semester 2004 CMR. Results suggest cadmium is unlikely to pose a hazard to burrowing owls nesting in the vicinity of Building 850. However, concentrations of Arochlor 1254 in the soil at Building 850 may pose a hazard to burrowing owls nesting in the area, as the hazard quotient (HQ) exceeds 1.

The California tiger salamander is a state and federally listed threatened species. Although California tiger salamanders are known to move up to 2 km from breeding ponds (U.S. Fish and Wildlife Service, 2004), research conducted by Trenham (2001) suggests that most (95%) California tiger salamanders use breeding habitat within 173 meters of breeding ponds. Survey results at Site 300 support this research. Although California tiger salamanders can utilize the Building 850 area as upland habitat, the largest concentration of California tiger salamanders is likely to be closer to breeding ponds. An exposure analysis on California tiger salamanders has not been conducted.

Remediation activities at Building 850 began on May 1, 2009 and are currently under way. Contaminated soil is being excavated from the hillsides adjacent to the firing table, solidified, and placed in the Corrective Action Management Unit located in the former Building 850 corporation yard. A biological opinion prepared by the United States Fish and Wildlife Service which analyzed the impacts to listed species from routine maintenance and operations projects at Site 300 was amended to include potential impacts from the Building 850 remediation activities. This amendment required several avoidance and minimization measures designed to reduce potential impacts to the California tiger salamander, which are being implemented during the

Building 850 remediation. These measures include: providing an environmental education program to all project personnel, conducting the work in the dry season, installing temporary exclusion fencing around the project site to keep California tiger salamanders from potentially entering the construction area, including escape ramps for wildlife for steep-walled excavations or trenches more than 1-foot deep or covering the trenches at the end of each work day, and not using any plastic mono-filament netting (erosion control netting) at the project site. In addition, DOE/LLNL will compensate for the loss of California tiger salamander habitat by setting aside 48.5 acres containing two existing seasonal pools at Site 300, and enhancing one of these pools so that it will hold water for a longer period of time.

Surveys for Western burrowing owls were conducted in the entire Building 850 remediation project site prior to construction (March and April of 2009). One Western burrowing owl was observed at a burrow west the disturbance area prior to construction. An exclusion zone was established around this burrow, but the owl left the area prior to the commencement of construction. This was an individual owl, and no evidence of nesting was observed at this location. Although impacts from the remediation activities to Western burrowing owls (which are not a federally-listed species) were not specifically analyzed in the biological opinion, the avoidance and minimization measures put into place provide some protection to this species. Upon completion of remediation activities, the risk to burrowing owls and tiger salamanders from contaminated soil will no longer exist. At this point, ecological surveys will be discontinued.

5. Data Management Program

The management of data collected during first semester 2009 was subject to the Environmental Restoration Department (ERD) data management process and standard operating procedures (Goodrich, 2009). This data management process tracks sample and analytical information from the 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, electronic and hard copy analytical results receipt, strict data validation and verification, data quality control procedures, and data retrieval and presentation. 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

During the first semester of 2009, there were no major changes to the relational database that is used to maintain the data for the CMR or the applications used to access the data. General maintenance and refinements were implemented to improve chain of custodies, data entry verification, and querying abilities. Improvements were made to the Self Monitoring Report application to simplify the review and approval process. Sample Planning and Chain of Custody Tracking (SPACT) was augmented by further automating data entry and creating new verifications using newly added data as part of the data entry process. Minor improvements and additions continue to be implemented to the ERD data management process in an ongoing effort to automate and improve the applications. Standard operating procedures are updated to reflect the changes necessitated by the normalization to the Oracle database.

5.2. New Procedures

A new web-enabled database tool is being developed to facilitate tracking of well drilling and maintenance. Due to the complexity of the problem and to support on-going work, tool development and implementation is being conducted in four phases. The process is currently in Phase 2.

The incorporation of analytical contract pricing, requested analysis, and analyte suites was also implemented in the database. No other major new development was done for the database or applications used to manage the CMR data.

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 packages, Integrated Work Sheets (IWSs), and Site Safety Plans. Modifications to existing LLNL quality assurance/quality control (QA/QC) procedures, new QA/QC procedures that were implemented during this reporting period, self-assessments, quality issues and corrective actions, and analytical and field quality control are discussed in Sections 6.1 through 6.6.

6.1. Modifications to Existing Procedures

LLNL Livermore Site and Site 300 Environmental Restoration Project SOPs, Revision 13 was released in April 2009. Revision 13 procedure updates were mainly focused on Chapters 2 and 5, which cover ground water sampling procedures and data management procedures, respectively. The following procedures were included in the release: SOP 1.12: Surface Soil sampling, 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 Bladder and 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 2.13: Barcad Sampling, SOP 4.1: General Instructions for Field Personnel, SOP 4.3: Sample Containers and Preservation, SOP 5.1: Data Management Printed Analytical Result Receipt and Processing, SOP 5.3: Data Management Electronic Analytical Result Receipt and Processing for Sample and Analysis Data, SOP 5.4: Data Management Hand Entry of Analytical Results, SOP 5.6: Ground Water Elevation Reports, SOP 5.8: Field Logbook Control, SOP 5.10: Data Management Receipt and Processing of Lithologic Data by Electronic Transfer, SOP 5.14: Issuing New Parameter Codes, and SOP 5.15: Livermore Site Routine Groundwater Sampling Plan Preparation. Chapter 2 procedures, SOP 2.8: Installation of Dedicated Sampling Devices and SOP 2.12: Ground Water Monitor Well and Equipment Maintenance were not included in

Revision 13, but are scheduled to be included with the next release due to a restructuring of the well and equipment installation procedures and tracking process.

6.2. New Procedures

SOP 4.10: Records Management is a new procedure included in Revision 13.

To meet the requirements of the newly established LLNL institution-wide work planning and control process, ERD's Integration Worksheets (IWSs) underwent a task base conversion to break each work activity down to the task-level. The potential hazards related to performing each task were identified and controls established. The IWSs were converted using the electronic IWS system that was reformatted as required by the institution-wide work control process. ERD has nearly fifty IWSs that have been reviewed or converted since the release of the electronic IWS system on June 1, 2009. There are approximately three IWSs remaining that have not been converted. The goal for completion is the end of September.

6.3. Self-assessments

ERD participates in formal and informal self-assessments. These assessments are used to evaluate work activities to QA and management procedures, and Integrated Safety Management System (ISMS) practices. External regulatory agencies also perform frequent walkabouts during ERD work activities. During this reporting period, an electrical safety assessment was performed for ERD work activities, i.e., electronic fabrication, and ground water sampling. There were approximately seven assessments and walkabouts performed for the ERD Site 300 work activities. Issues and deficiencies observed during the assessments are tracked from inception to resolution using the institutional Issues Tracking System (ITS). To date, all ERD Site 300 work related issues and deficiencies have been successfully corrected and closed-out in the ITS.

6.4. Quality Issues and Corrective Actions

Quality improvement, nonconformance, and corrective action reporting is documented using the Quality Improvement Form (QIF). There were no QIFs processed during this reporting period. QIFs are being generated with recommended corrective actions to resolve issues observed during the electrical safety inspections.

6.5. Analytical Quality Control

Data review, validation, and verification are conducted on 100% of the incoming analytical data. Contract analytical laboratories are contractually required to provide internal quality control (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 is qualified as rejected only when there is a serious deficiency in the ability to analyze the sample and meet QC criteria. There were no significant data anomalies to report during this semester.

During the first semester 2009, ground water uranium analyses were performed by two methods: 1) alpha spectrometry (EPA Method 907) by a contract laboratory and 2) inductively coupled plasma-mass spectrometry (ICP-MS) using an LLNL developed state-of-the-art isotope dilution method that provides precise ^{235}U and ^{238}U measurements. The majority of the ground water samples collected at Site 300 in the first semester 2009 were analyzed using EPA Method 907, which provides a measure of total uranium activity, but does not provide the precise quantitation of ^{235}U at low total uranium activities necessary for determination of $^{235}U/^{238}U$ atom ratio. This atom ratio is necessary for defining the presence of depleted uranium in the ground water sample. However, as determined from an internal evaluation of the data, the total uranium activities garnered from the two methods are comparable and can be utilized together in comparison to the 20 pCi/L clean up standard.

6.6. Field Quality Control

Quality control is implemented during the sample collection process in the field. Ten percent of samples are collocated (5% intralaboratory and 5% interlaboratory). Field blanks and trip blanks are used to identify contamination that may occur during sample collection, transportation, or handling of samples at the analytical laboratory. Equipment blanks are used to determine the effectiveness of decontamination processes of portable equipment used for purging and/or sample collection. There were no cross-contamination issues indicated by trip blank, field blank, or equipment blank analyses during this reporting period.

7. References

Blake R., and M. Taffet (2008a) *Compliance Monitoring Program for the CERCLA-Closed Pit 6 Landfill, First Quarter 2008 Report*, Lawrence Livermore National Laboratory, Livermore, CA (UCRL-AR-132057-08-1).

Blake R., and M. Taffet (2008b) *Compliance Monitoring Program for the CERCLA-Closed Pit 6 Landfill, Second Quarter 2008 Report*, Lawrence Livermore National Laboratory, Livermore, CA (UCRL-AR-132057-08-2).

California Department of Fish and Game (2004), State and Federally Listed Endangered and Threatened Animals of California. Available online at: http://www.dfg.ca.gov/hcpb/species/t_e_spp/tespp.shtml.

California Regional Water Quality Control Board, Central Valley Region (2005), *Monitoring And Reporting Program For Regents Of The University Of California United States Department Of Energy And Lawrence Livermore National Laboratory Site 300 Eastern General Services Area Groundwater Treatment System, San Joaquin County.*

Carlsen, T., V. Dibley, S. Gregory, V. Madrid, M. Taffet, J. Valett (2003), *First Semester 2003 Compliance Report for Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif.

Daily, W. (2004), *Operations and Maintenance Manual, Volume VI: Central General Services Area Vapor and Ground Water Treatment Facilities (VTFCGSA and TFCGSA)*, Lawrence Livermore National Laboratory, Livermore, Calif.

Dibley, V.R. (1999), *Livermore Site and Site 300 Environmental Restoration Projects Quality Assurance Project Plan*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-103160 Rev. 2).

Dibley, V., R. Blake, T. Carlsen, M. Denton, R. Goodrich, S. Gregory, K. Grote, V. Madrid, C. Stoker, M. Taffet, J. Valett (2004a), *2003 Annual Compliance Report for Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206319).

Dibley, V., R. Blake, T. Carlsen, S. Chamberlain, W. Daily, Z. Demir, M. Denton, R. Goodrich, S. Gregory, V. Madrid, M. Taffet, J. Valett (2004b), *First Semester 2004 Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206769-04).

Dibley, V., T. Carlsen, S. Chamberlain, W. Daily, Z. Demir, M. Denton, R. Goodrich, S. Gregory, V. Madrid, M. Taffet, J. Valett (2005a), *2004 Annual Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206319-04).

Dibley, V., T. Carlsen, S. Chamberlain, W. Daily, Z. Demir, M. Denton, R. Goodrich, S. Gregory, V. Madrid, M. Taffet, J. Valett (2005b), *First Semester 2005 Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206769-05).

Dibley, V., M. Taffet, J. Valett, M. Denton, S. Gregory, T. Carlsen, Z. Demir, W. Daily, D. Mason, P. McKereghan, R. Goodrich, S. Chamberlain (2006a), *2005 Annual Compliance*

Monitoring Report, Lawrence Livermore National Laboratory Site 300, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206319-05).

Dibley, V., M. Taffet, J. Valett, M. Denton, S. Gregory, T. Carlsen, Z. Demir, W. Daily, D. Mason, P. McKereghan, R. Goodrich, S. Chamberlain (2006b), *First Semester 2006 Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206769-06).

Dibley, V., M. Taffet, J. Valett, M. Denton, S. Gregory, T. Carlsen, Z. Demir, D. Mason, P. McKereghan, R. Goodrich, S. Chamberlain (2007a), *2006 Annual Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206319-06).

Dibley, V., S. Gregory, M. Taffet, J. Valett, M. Denton, V. Madrid, T. Carlsen, Z. Demir, D. Mason, P. McKereghan, R. Goodrich, S. Chamberlain (2007b), *First Semester 2007 Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206769-07).

Dibley, V., S. Gregory, M. Taffet, V. Madrid, J. Valett, M. Denton, T. Carlsen, Z. Demir, D. Mason, P. McKereghan, R. Goodrich, S. Chamberlain (2008), *2007 Annual Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206319-07).

Dibley, V., L. Ferry, and M. Buscheck Ed. (2009), *2008 Annual Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206319-08).

DTSC (2005) Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, California EPA – DTSC.

Environmental Quality Management, Inc. (2001), *Supplemental Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathways*, Prepared for the USEPA Superfund Program Office of Emergency Response and Remediation, Washington, D.C.

Environmental Quality Management, Inc. (2004), *User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings*, Prepared for the USEPA Superfund Program Office of Emergency Response and Remediation, Washington, D.C.

Ferry, R., L. Ferry, M. Dresen, and T. Carlsen (2002), *Compliance Monitoring Plan/Contingency Plan for Interim Remedies at Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-147570).

Ferry, L., and C. Holtzapple (2005), Lawrence Livermore National Laboratory, Environmental Restoration Division, Livermore, Calif., letter to Ted Park, Kathy Setian, and Susan Timm, August 2, 2005, "Central GSA Soil Vapor Extraction Zone of Influence Testing at Lawrence Livermore National Laboratory Site 300."

Ferry, L., M. Dresen, Z. Demir, V. Dibley, V. Madrid, M. Taffet, S. Gregory, J. Valett, M. Denton (2006), *Final Site-Wide Remediation Evaluation Summary Report for Lawrence Livermore National Laboratory Site 300,* Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-220391).

Goodrich, R., and J. Wimborough (Eds.) (2007), *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures (SOPs)*, Lawrence Livermore National Laboratory Livermore, Calif. (UCRL-MA-109115 Rev. 12).

Holtzapple, C. (2007), *Shutdown of the Eastern General Services Area Ground Water Extraction and Treatment System at Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (letter).

Holtzapple, C. and L. Ferry (2007), *Compliance Feasibility Report for the Eastern General Services Area Treatment Facility at Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (letter).

Jackson, S (2008) *Statistically Significant Evidence for a Release of Total Uranium from Lawrence Livermore National Laboratory Experimental Test Site (Site 300) Pit 6*, Letter to S. Timm, RWQCB (WGMG08-022).

Johnson, P. C, and R. A. Ettinger (1991), "Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors in Buildings," *Environ. Sci. Technol.* **25**, 1445–1452.

Johnson, P. C. (2002), "Identification of Critical Parameters for the Johnson and Ettinger (1991) Vapor Intrusion Model," American Petroleum Institute *Bulletin No. 17*, Washington, D.C.

Jury, W. A., W. F. Spencer, and W. J. Farmer (1983), "Behavior Assessment Models for Trace Organics in Soil: I Model description," *J. Environ. Qual.* **12**, 558–564. (Errata see: *J. Environ. Qual.* **16**, 448).

Lawrence Livermore National Laboratory (2008), *First Semester 2008 Compliance Monitoring Report, Lawrence Livermore National Laboratory Site 300*, Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-206769-08).

Martins, S. (2006), *Operations and Maintenance Manual, Volume VII: Treatment Facility Eastern General Services Area (TFEGSA)*, Lawrence Livermore National Laboratory, Livermore, Calif.

Office of Environmental Health and Hazard Assessment. (2004), Human-Exposure-Based Screening Numbers Developed to Aid Estimation of Cleanup Costs for Contaminated Soil. Integrated Risk Assessment Section.

Trenham, P.C. (2001), *Terrestrial habitat use by adult California tiger salamanders,* Journal of Herpetology Vol. 25, No. 2, pp. 343-346.

U.S. DOE (1997), *Final Record of Decision for the General Services Area Operable Unit Lawrence Livermore National Laboratory Site 300,* Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-124061).

U.S. DOE (2001), *Interim Site-Wide Record of Decision for Lawrence Livermore National Laboratory Site 300,* Lawrence Livermore National Laboratory, Livermore, Calif. (UCRL-AR-138470).

U.S. EPA (2002), OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), EPA530-D-02-004.

U.S. Fish and Wildlife Service (2004), "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Tiger Salamander; and Special Exemption for Existing Routine Ranching Activities; Final Rule," Federal Register **69**(149) 47212–47248.

Wannamaker E. (2004) Technical memorandum: Superfund JE Model Spreadsheet Error, EnviroGroup Limited.

Figures

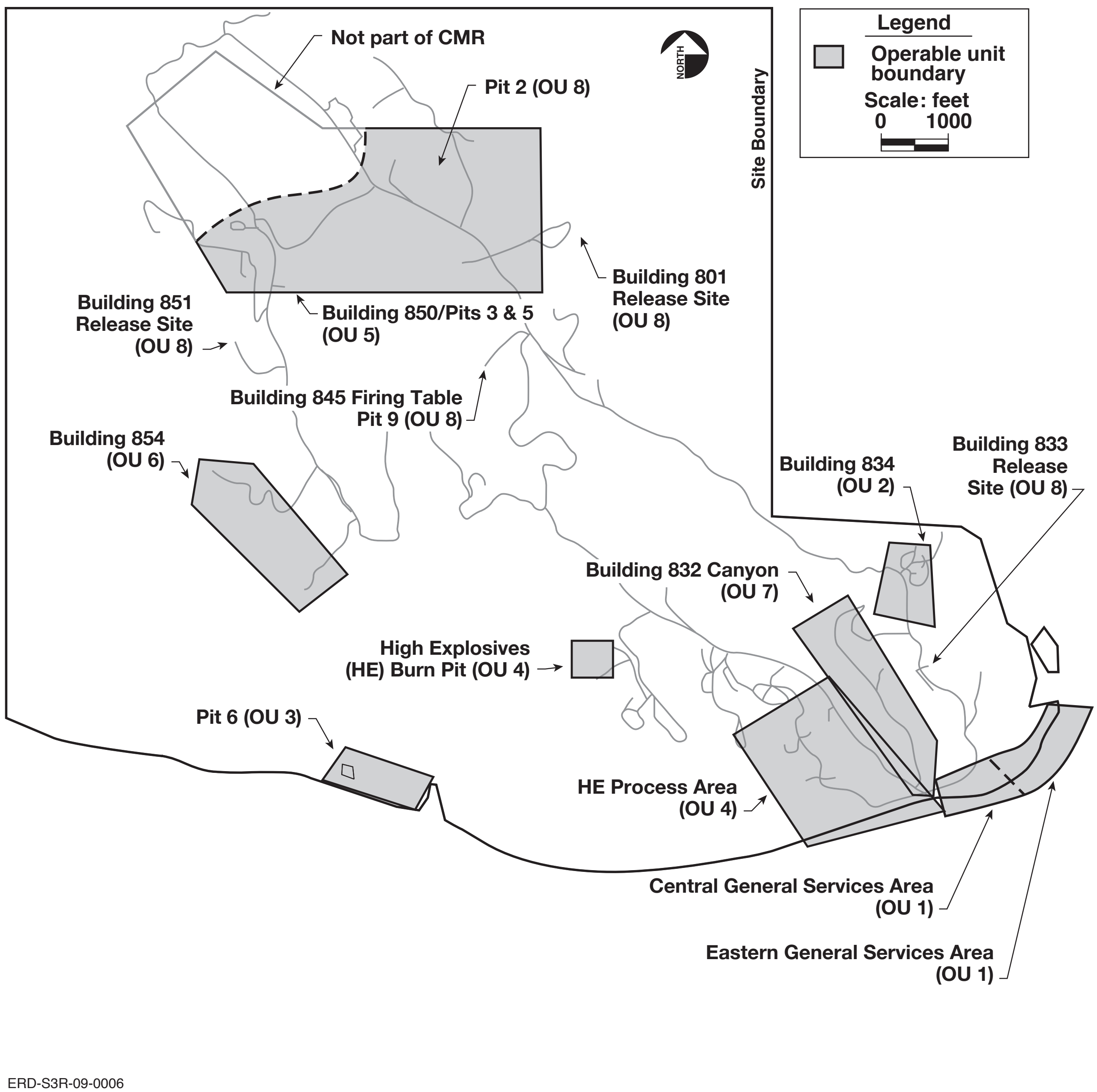


Figure 2-1. Site 300 map showing OU locations.

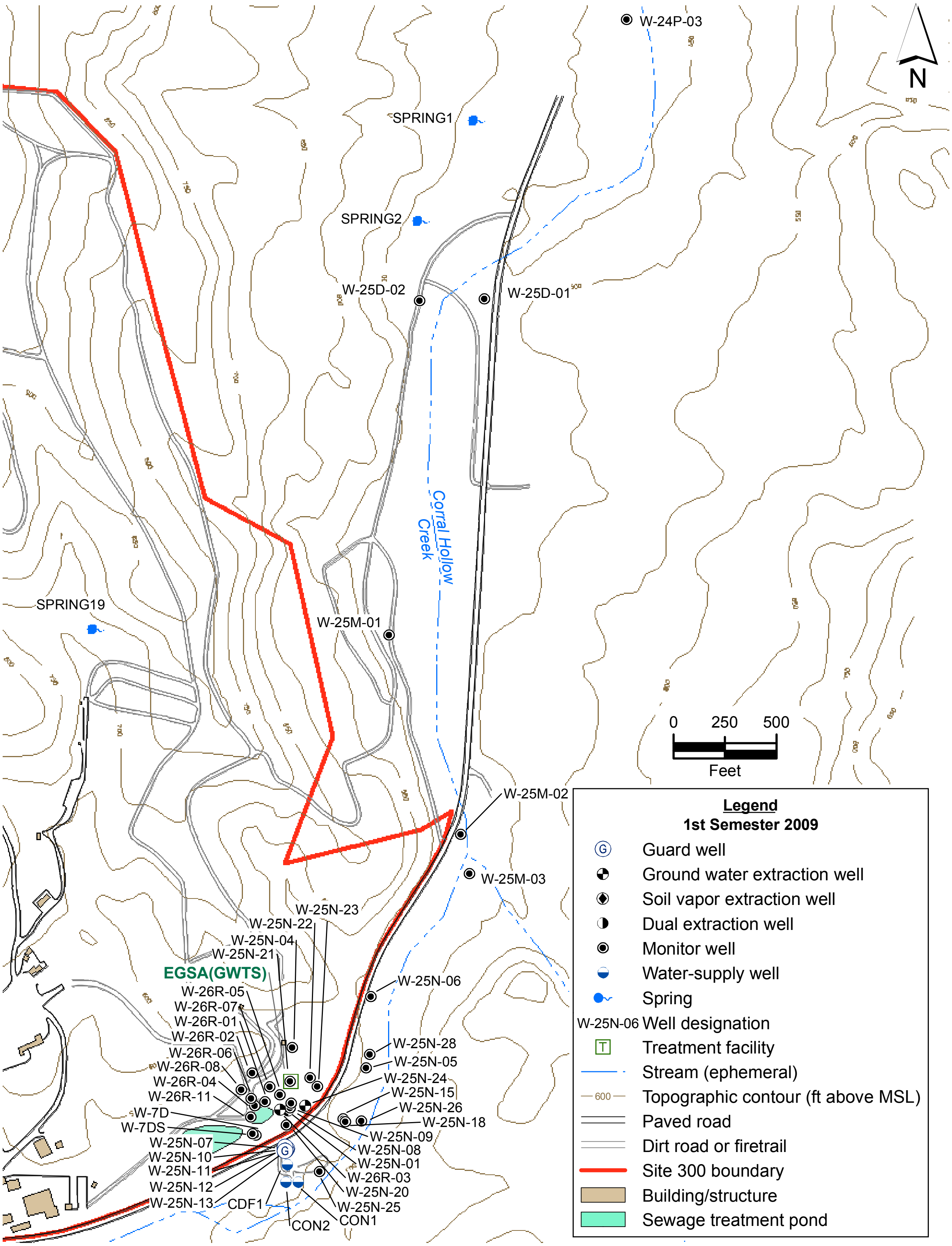


Figure 2.1-1. Eastern General Services Area OU site map showing monitor, extraction and water-supply wells, and treatment facilities.

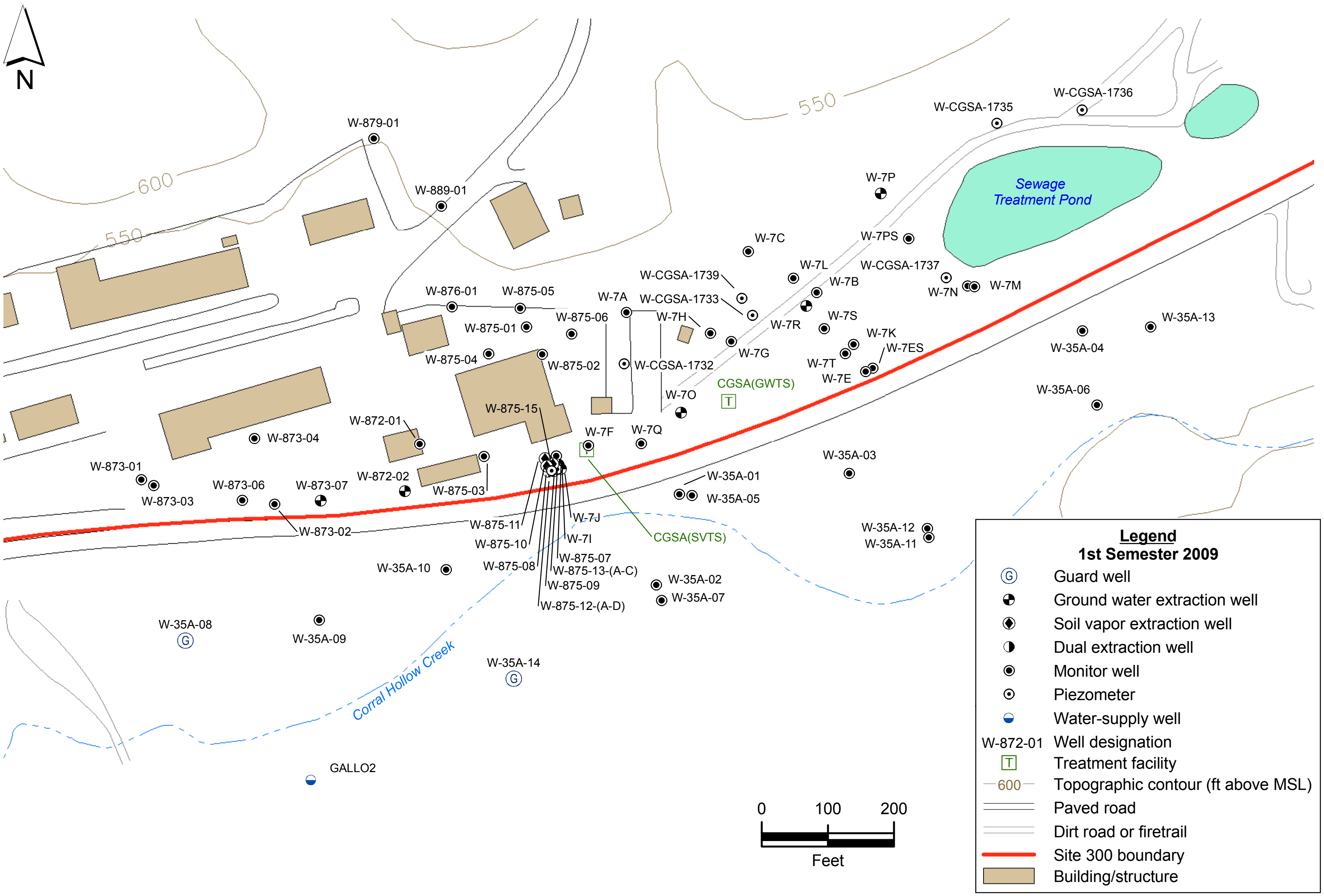


Figure 2.1-2. Central General Services Area OU site map showing monitor, extraction and water-supply wells, and treatment facilities.

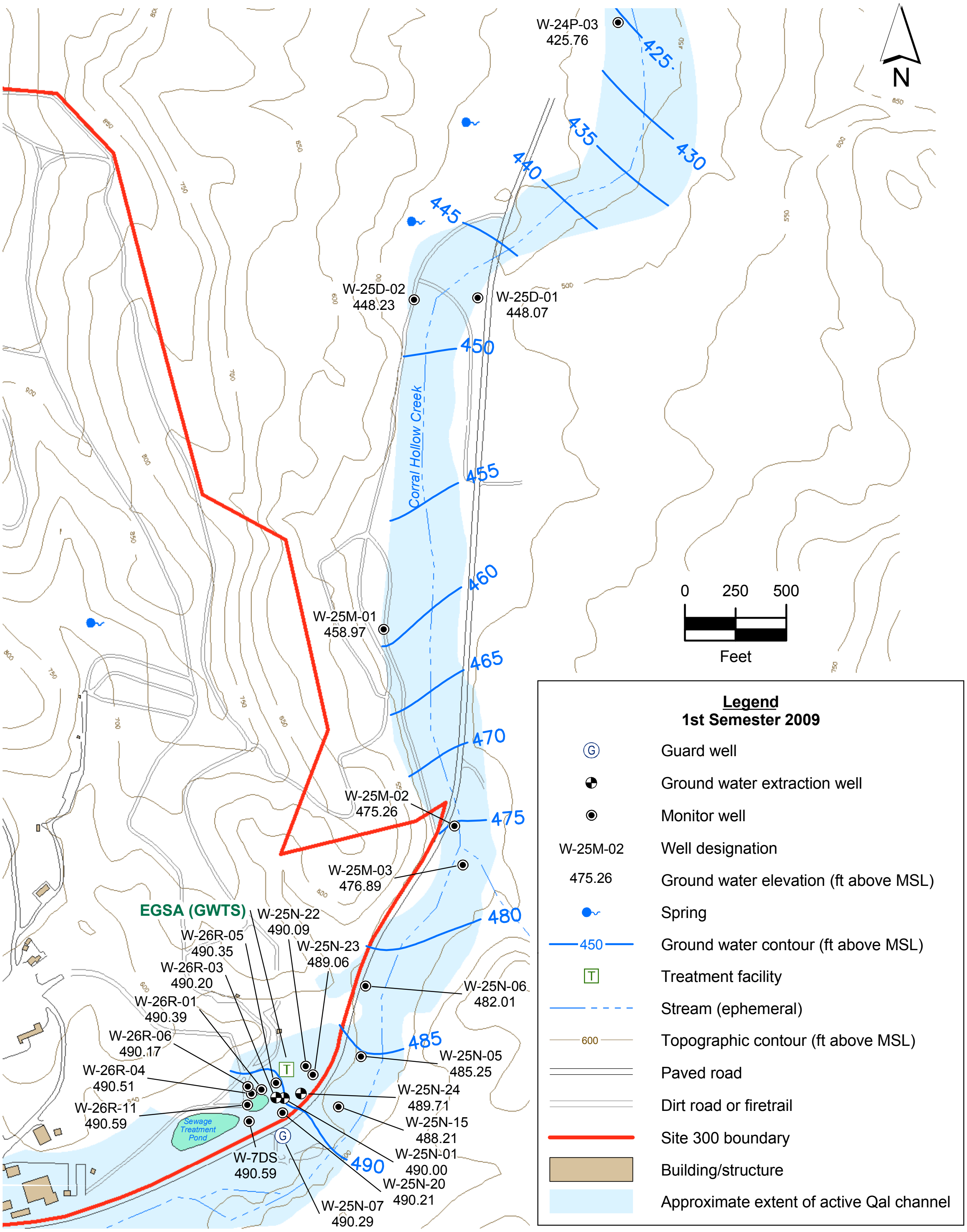


Figure 2.1-3. Eastern General Services Area OU ground water potentiometric surface map for the Qal-Tnbs$_1$ HSU.

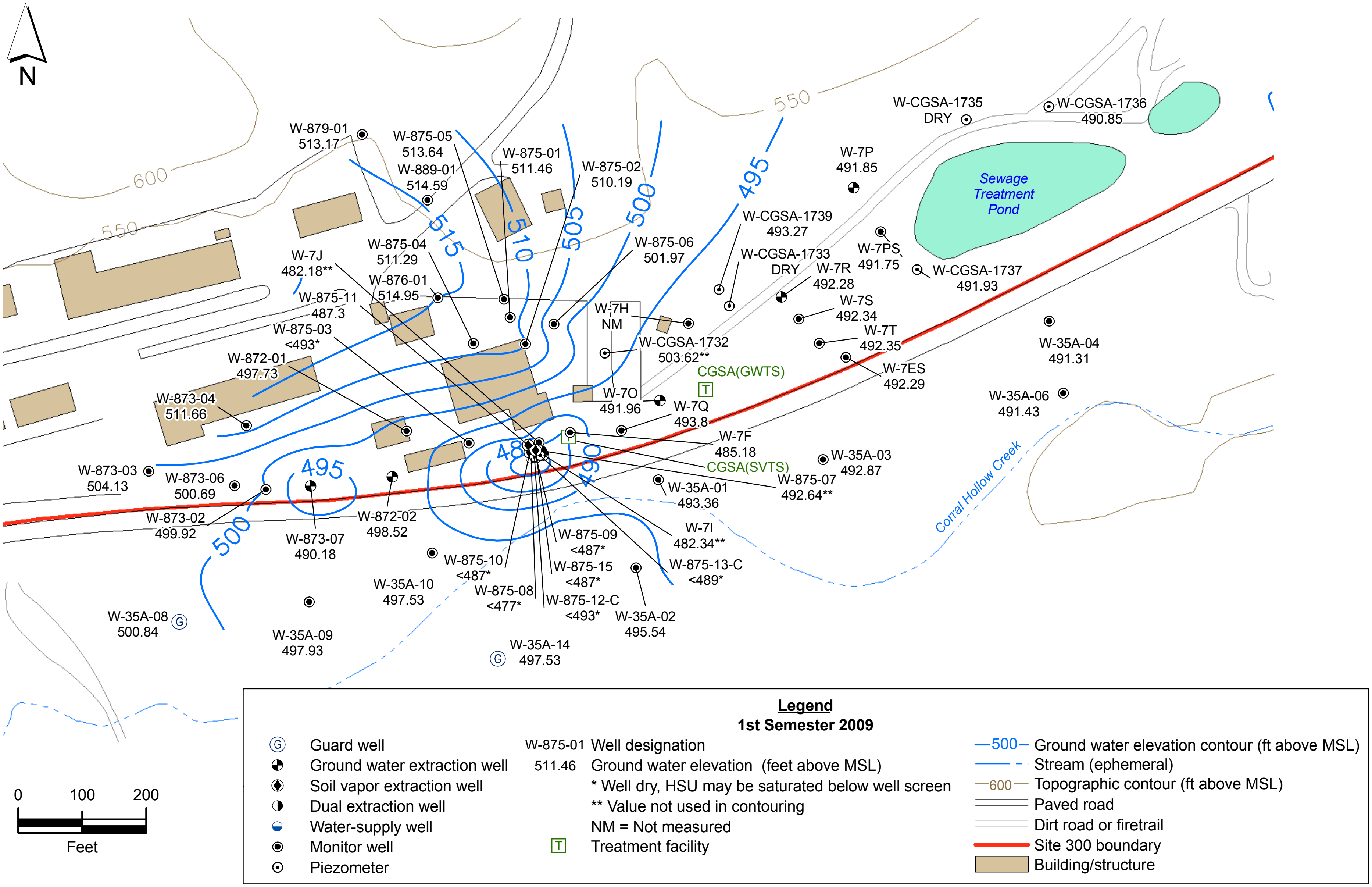


Figure 2.1-4. Central General Services Area OU ground water potentiometric surface map for the Qt-Tnsc$_1$ and Qal-Tnbs$_1$ HSUs.

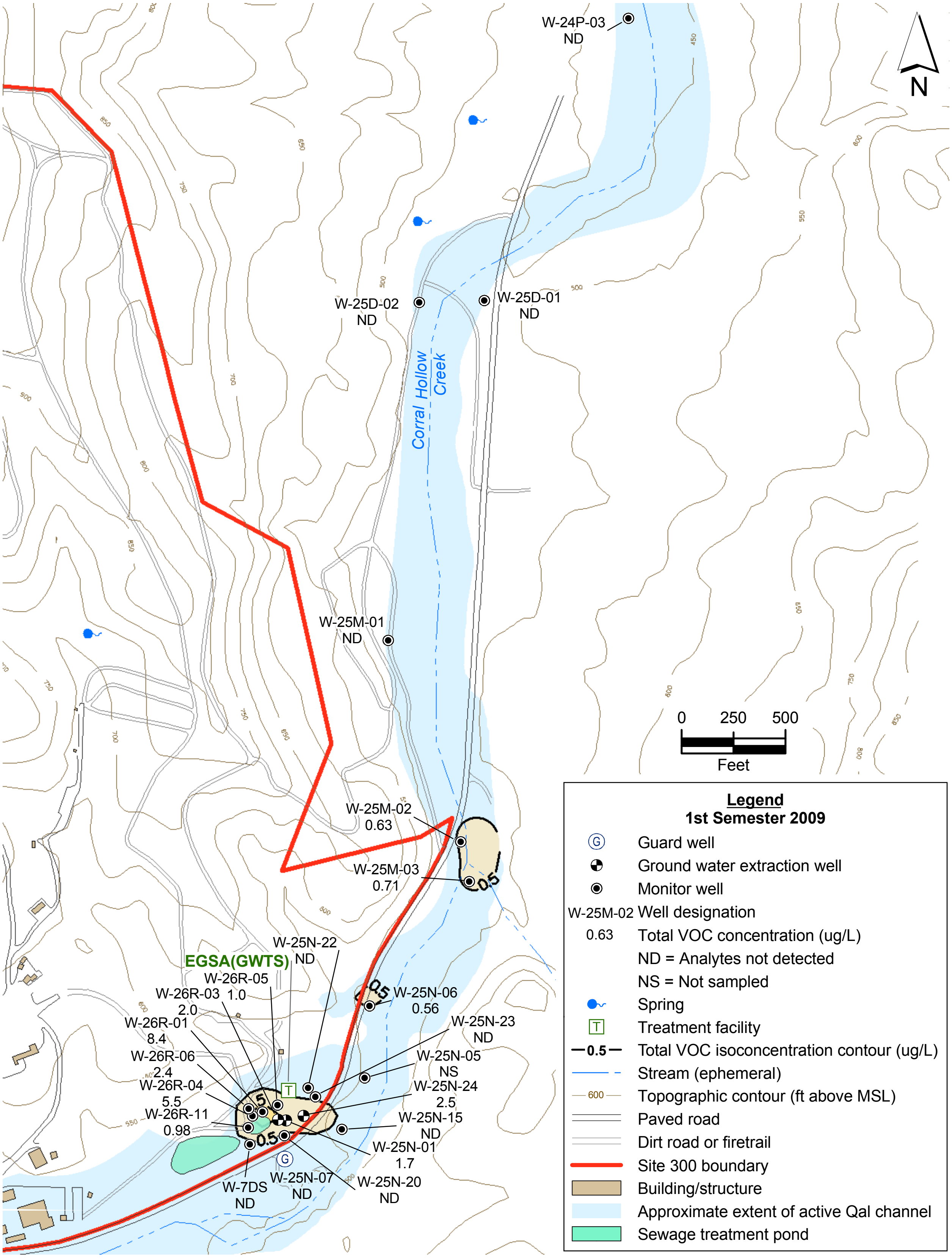


Figure 2.1-5. Eastern General Services Area OU total VOC isoconcentration contour map for the Qal-Tnbs$_1$ HSU.

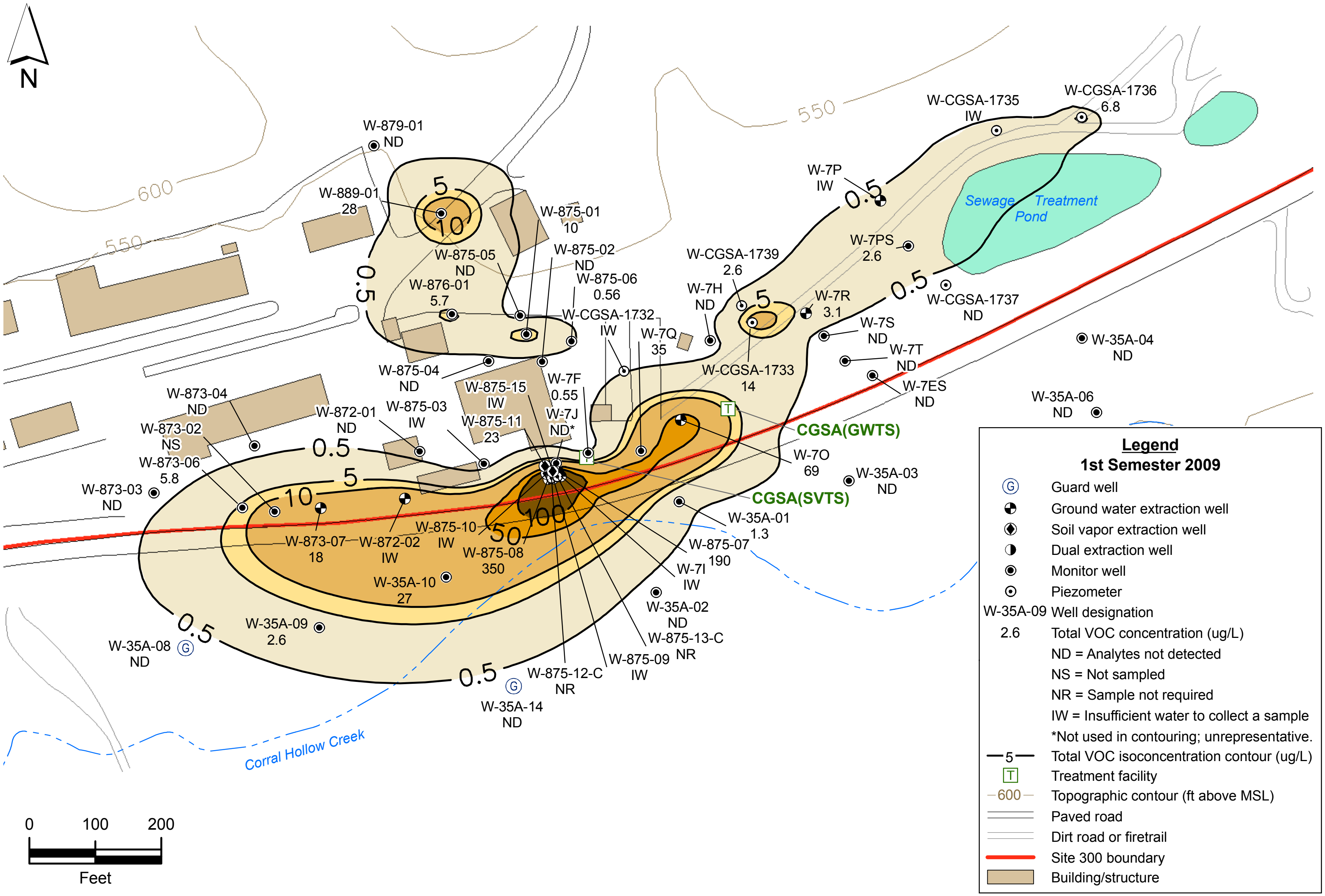


Figure 2.1-6. Central General Services Area OU total VOC isoconcentration contour map for the Qt-Tnsc$_1$ and Qal-Tnbs$_1$ HSUs.

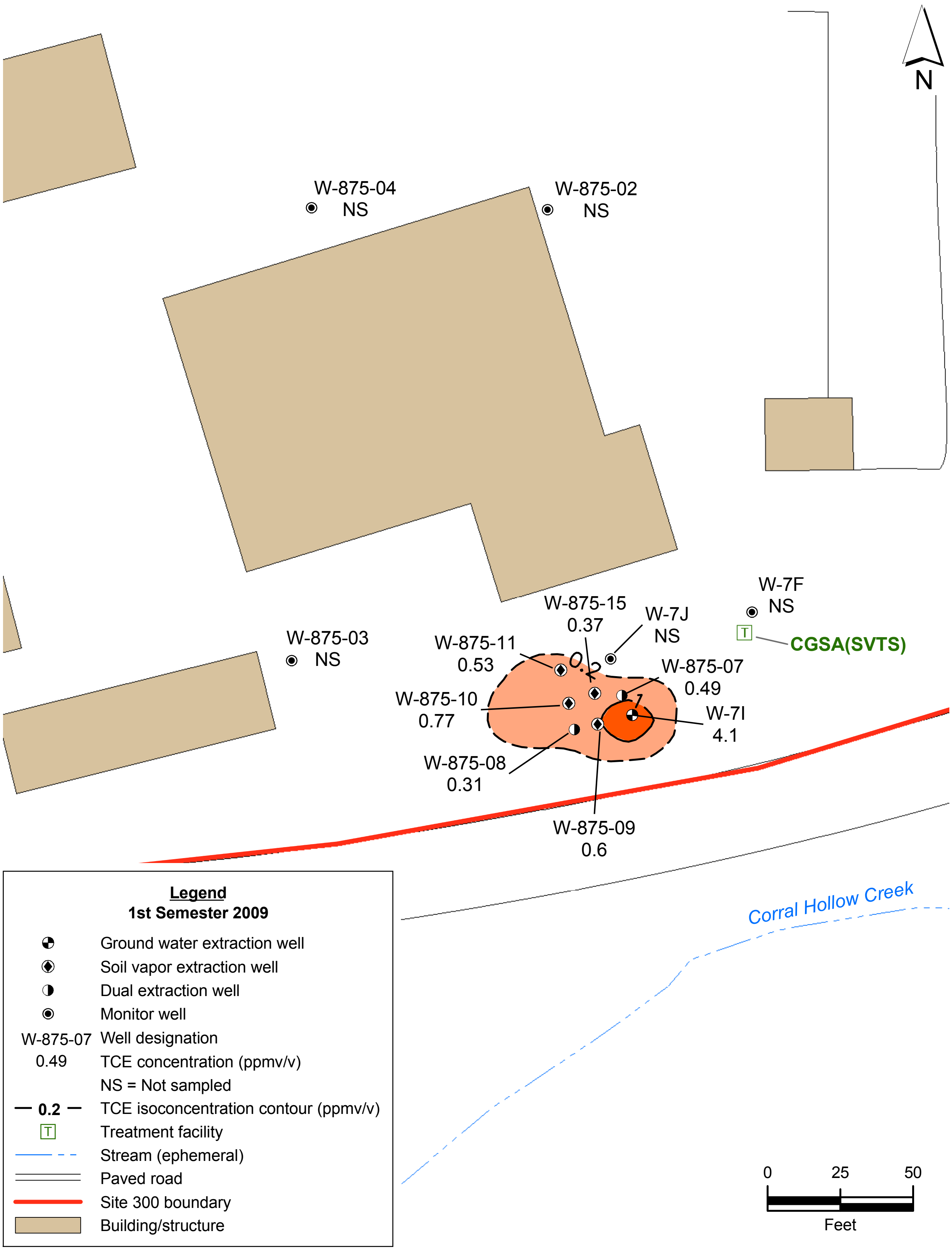


Figure 2.1-7. TCE concentration ($ppm_{v/v}$) in soil vapor near Building 875 of the Central GSA, April 29, 2009.

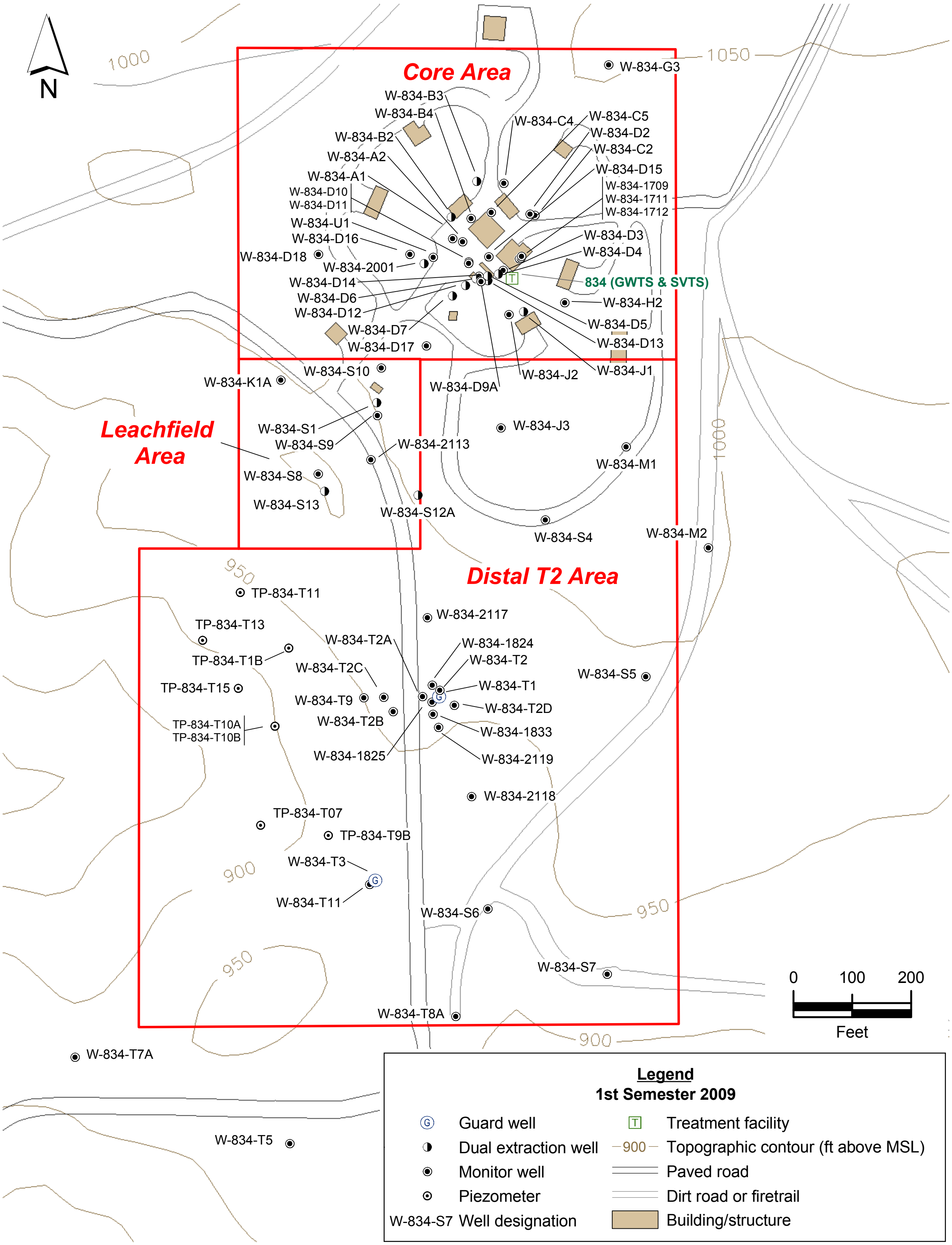


Figure 2.2-1. Building 834 OU site map showing monitor and extraction wells, and treatment facilities.

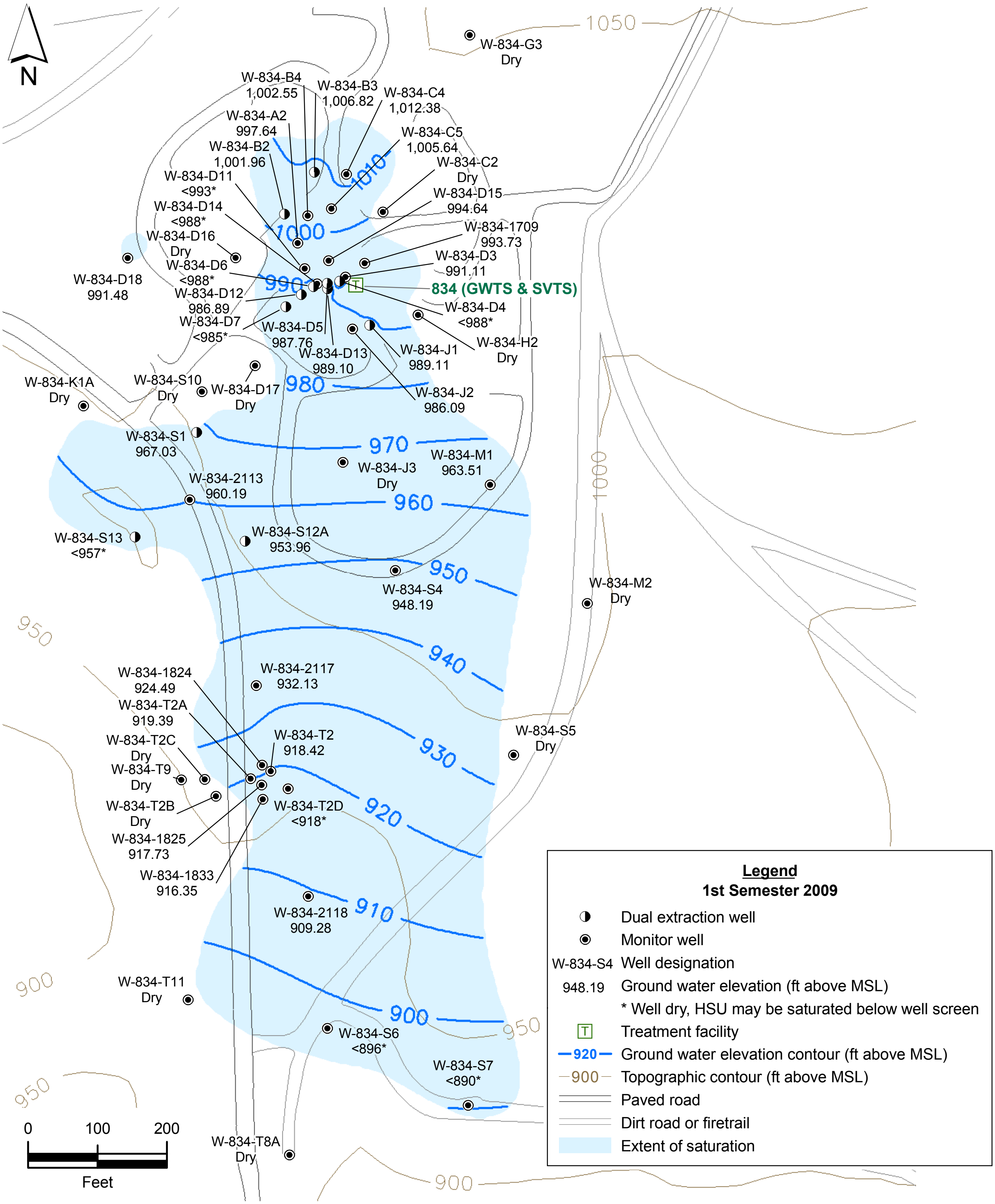


Figure 2.2-2. Building 834 OU ground water potentiometric surface map for the Tpsg perched water-bearing zone.

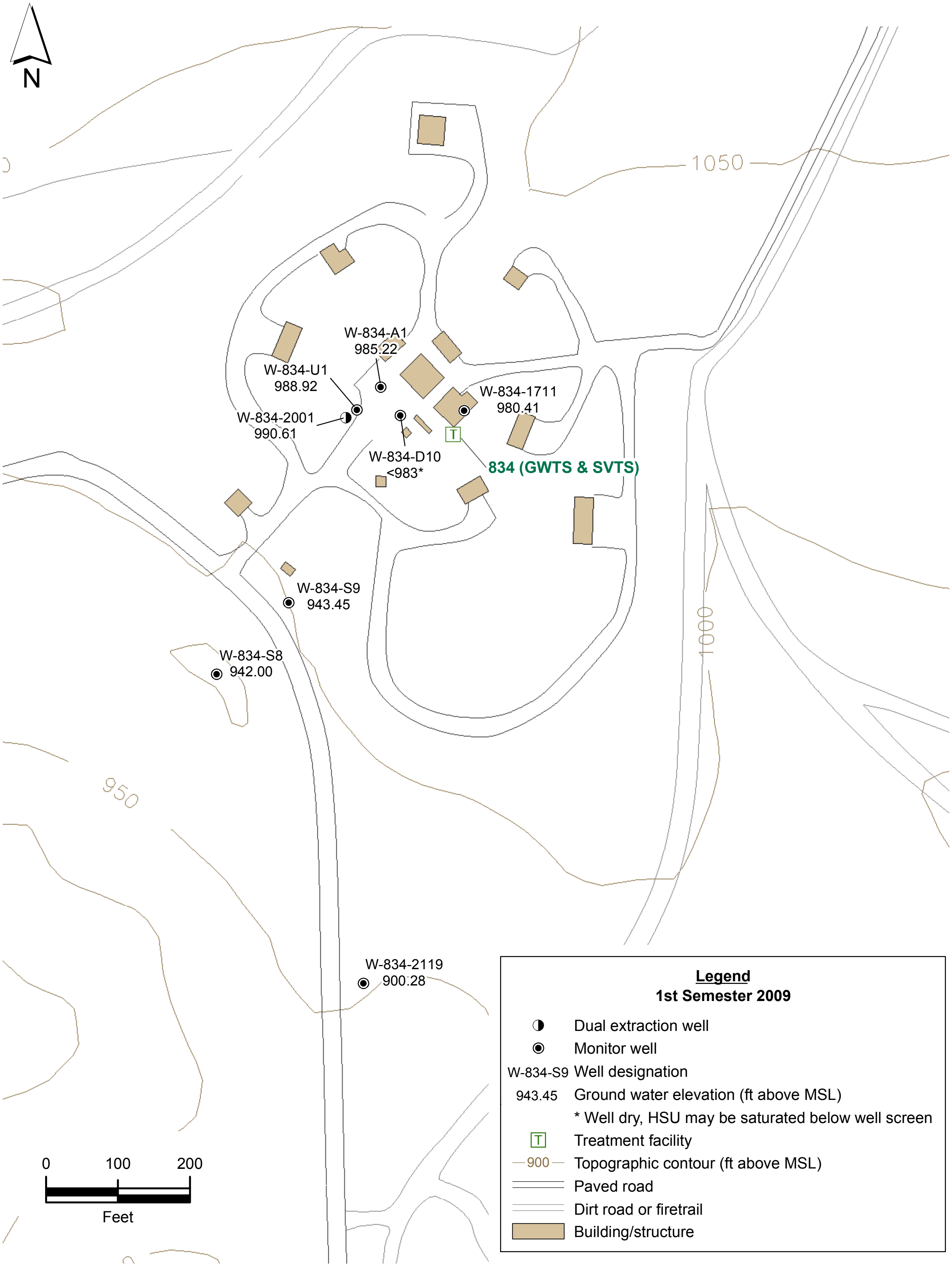


Figure 2.2-3. Building 834 OU map showing ground water elevations for the Tps-$Tnsc_2$ HSU.

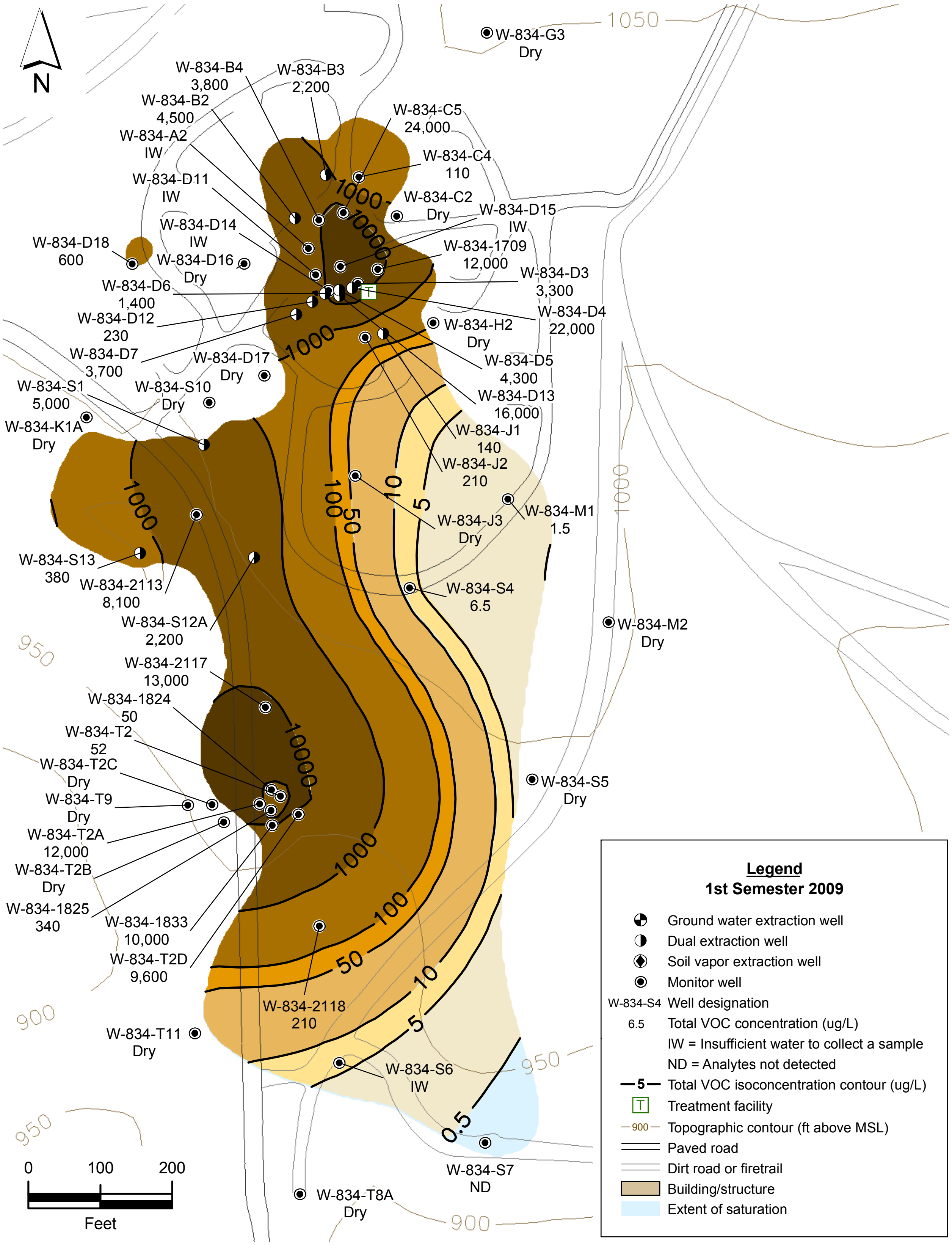


Figure 2.2-4. Building 834 OU total VOC isoconcentration contour map for the Tpsg perched water-bearing zone.

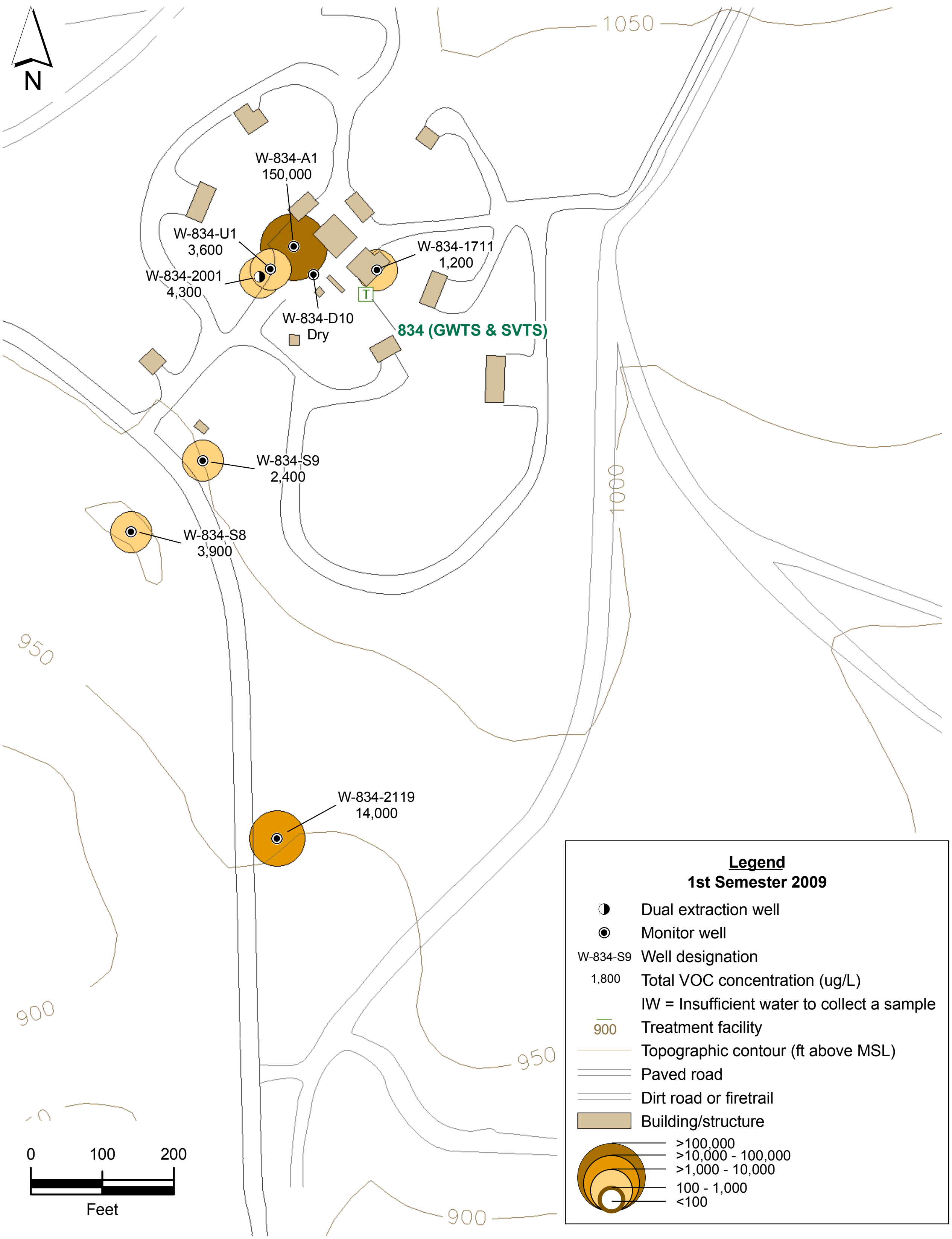


Figure 2.2-5. Building 834 OU map showing total VOC concentrations for the Tps-Tnsc$_2$ HSU.

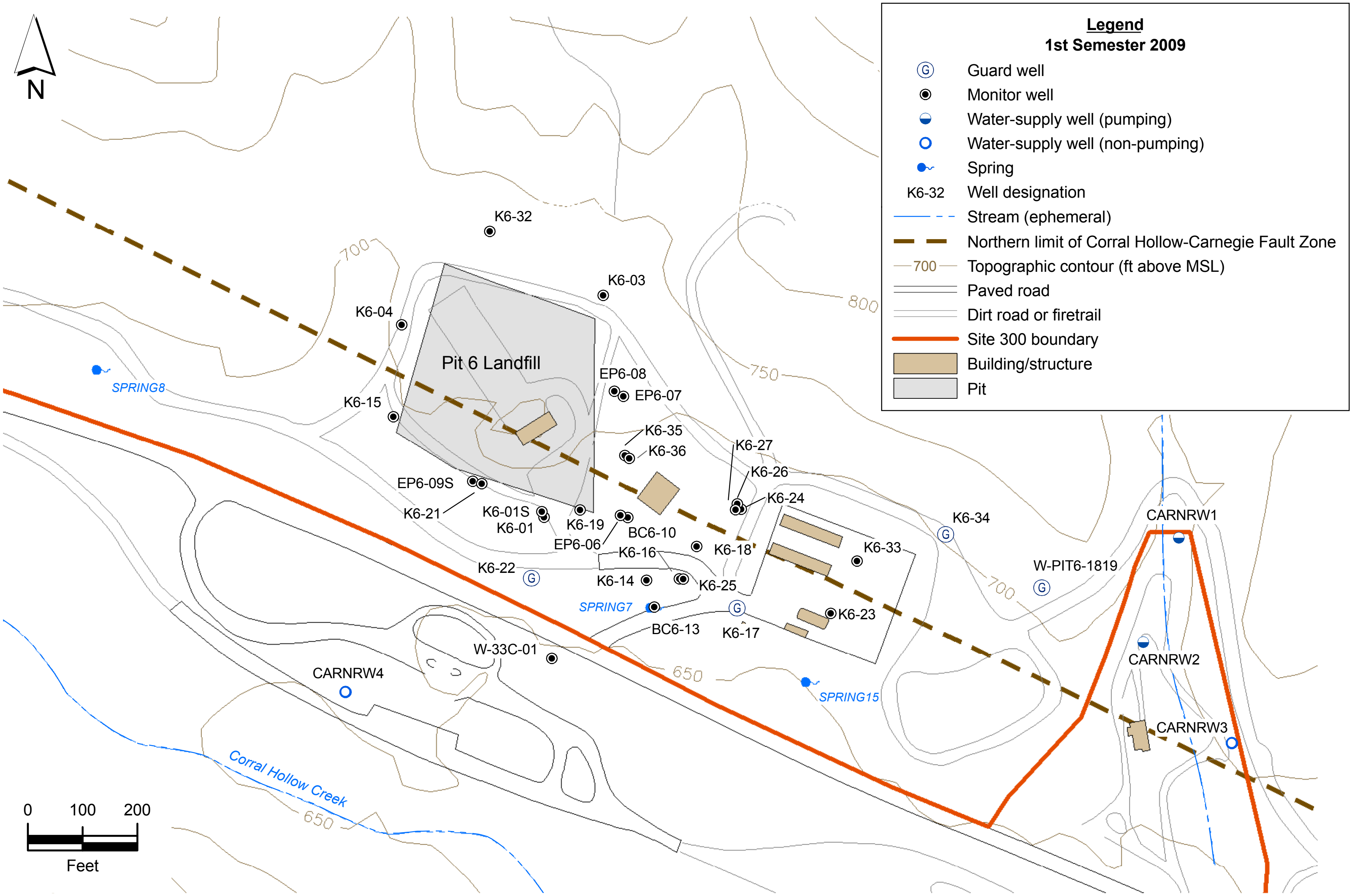


Figure 2.3-1. Pit 6 Landfill OU site map showing monitor and water-supply wells.

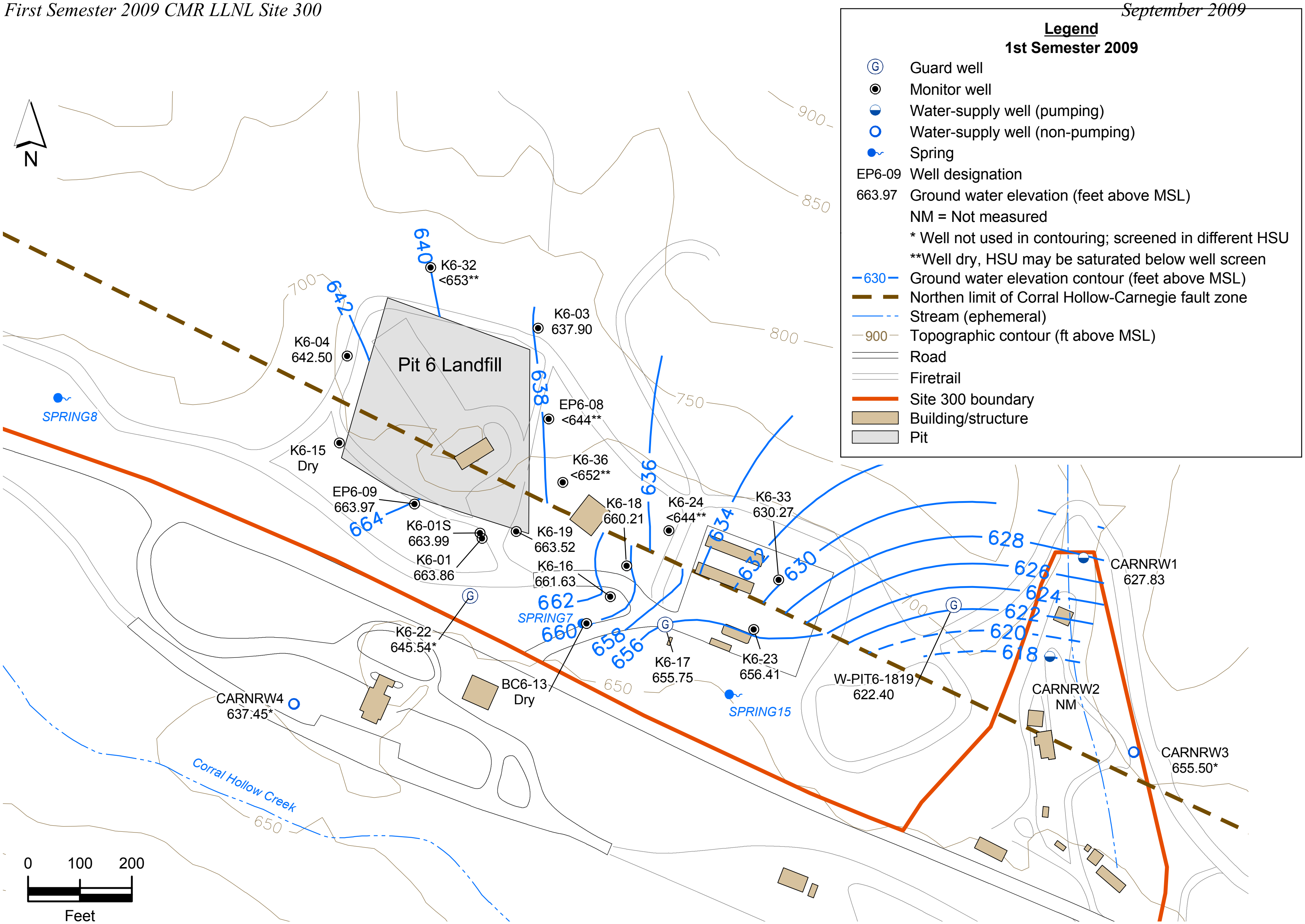


Figure 2.3-2. Pit 6 Landfill OU ground water potentiometric surface map for the Qt-Tnbs$_1$ HSU.

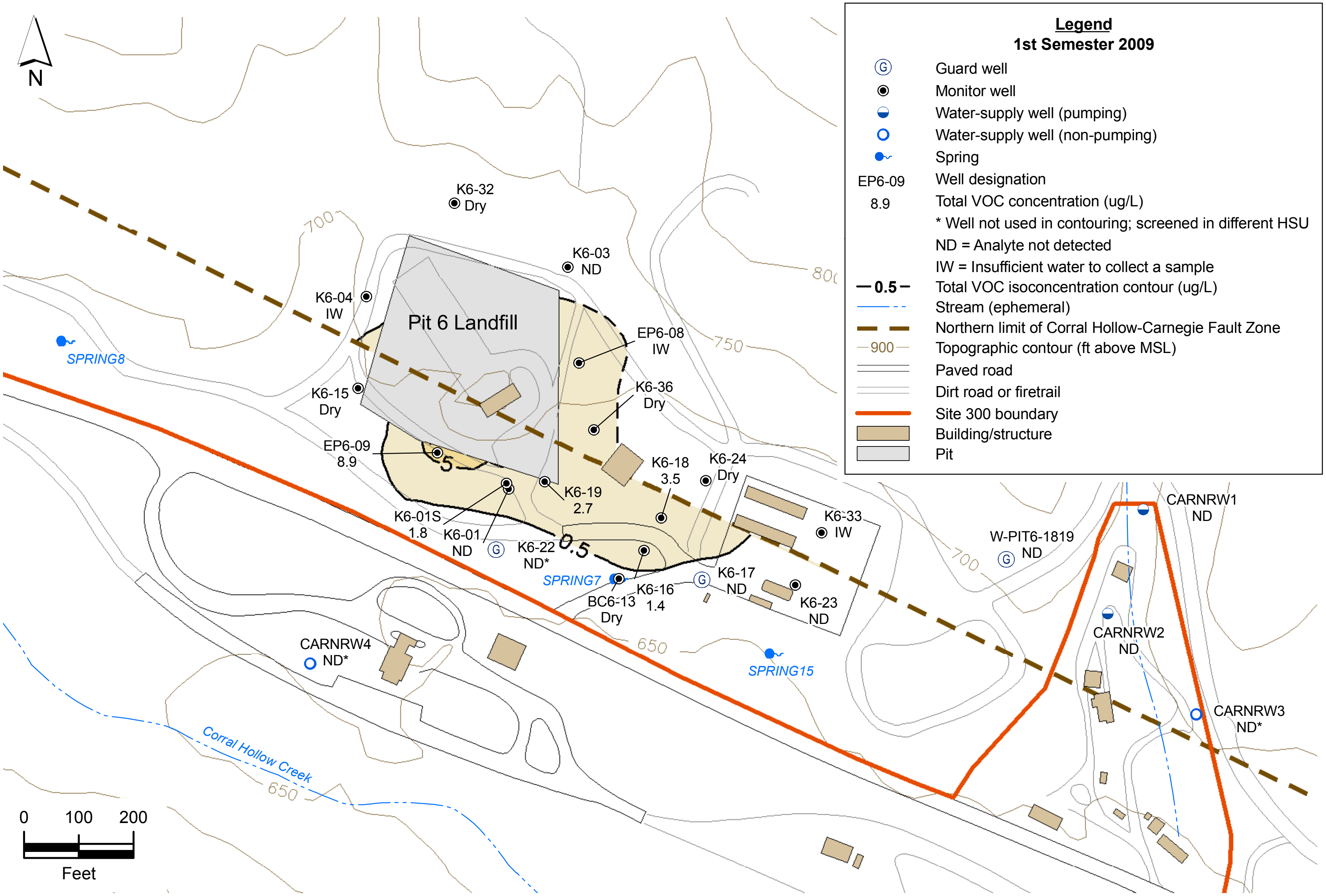


Figure 2.3-3. Pit 6 Landfill OU total VOC isoconcentration contour map for the Qt-Tnbs$_1$ HSU.

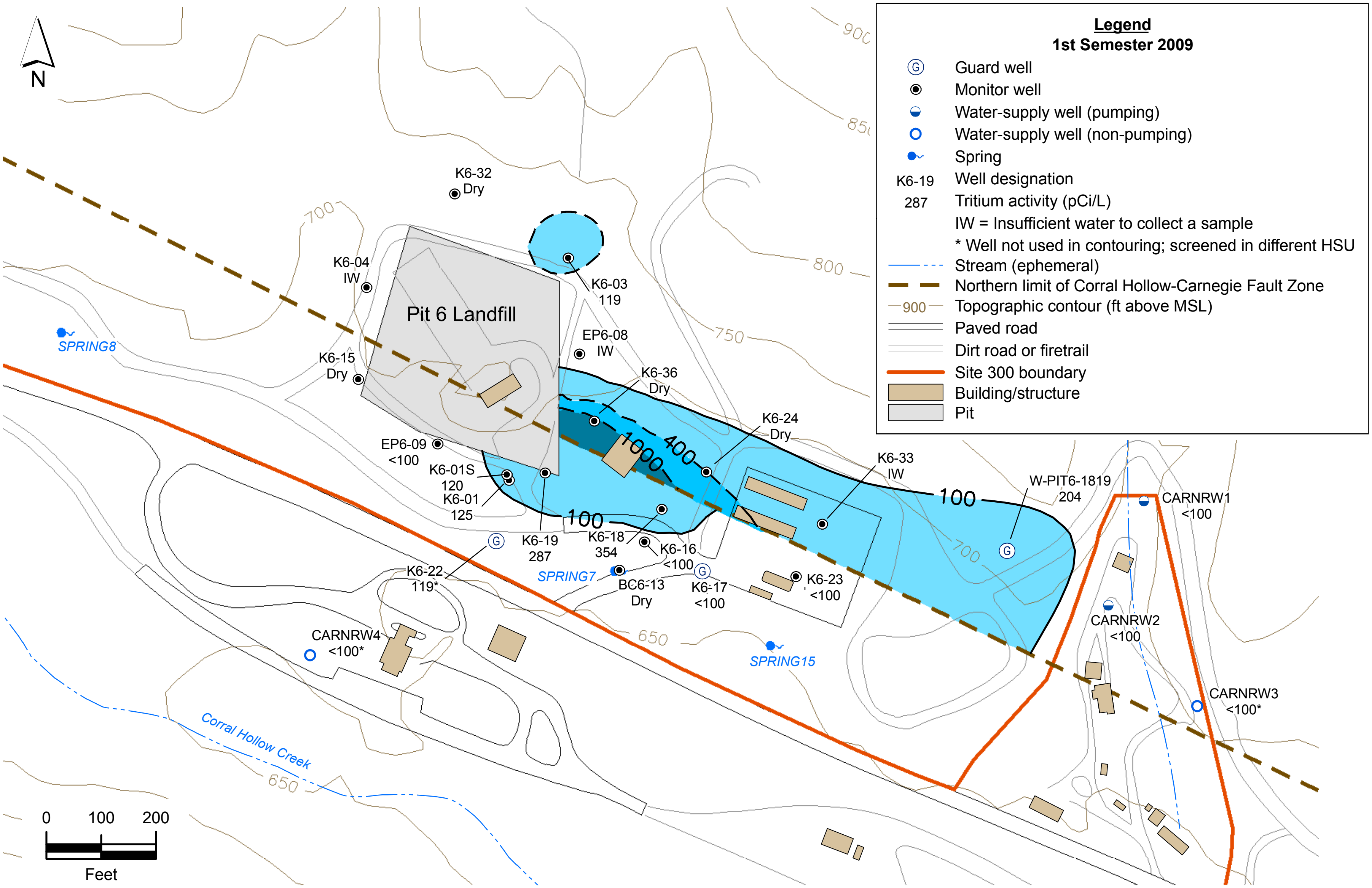


Figure 2.3-4. Pit 6 Landfill OU tritium activity isocontour map for the Qt-Tnbs$_1$ HSU.

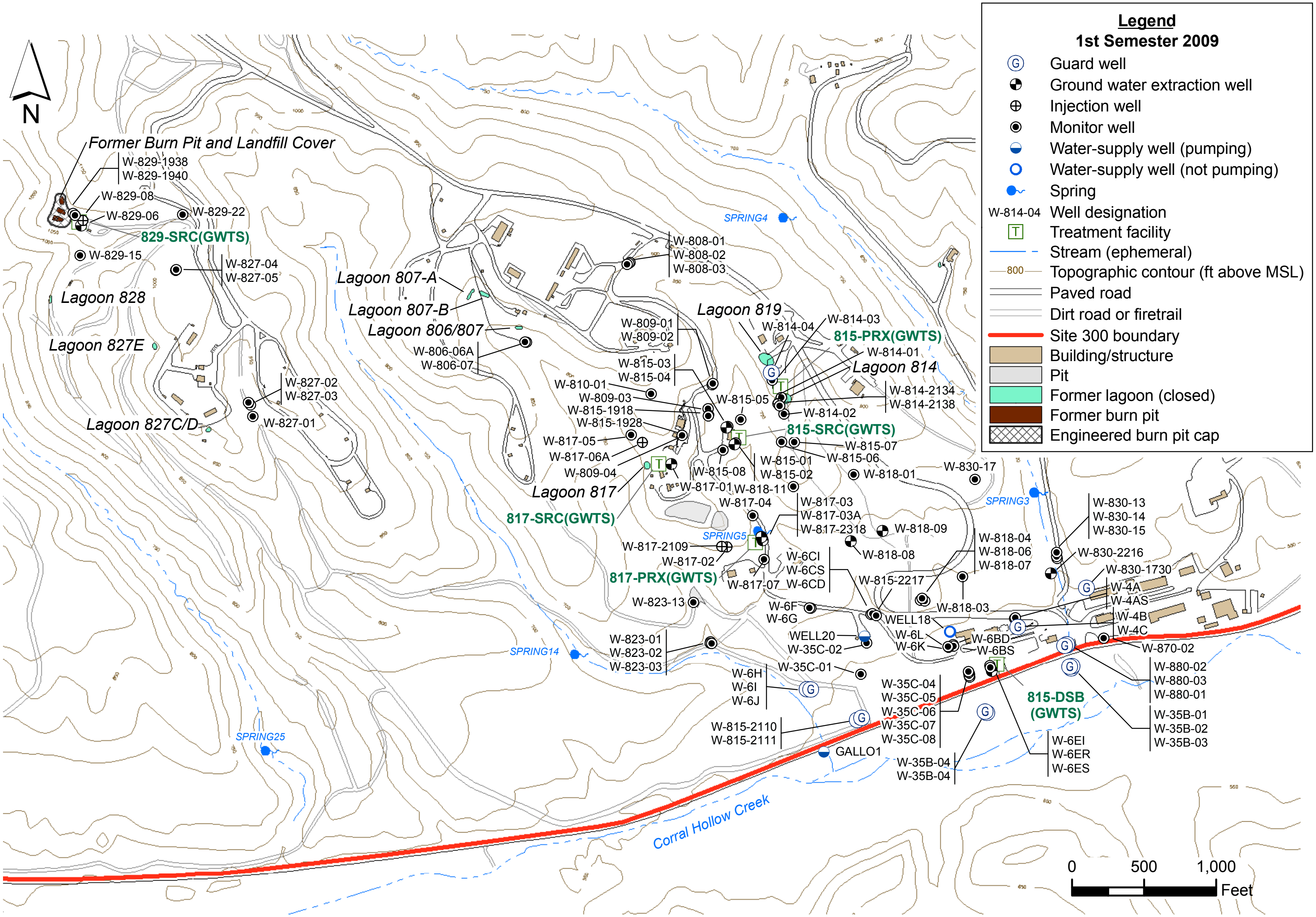


Figure 2.4-1. High Explosives Process Area OU site map showing monitor, extraction, injection and water-supply wells, and treatment facilities.

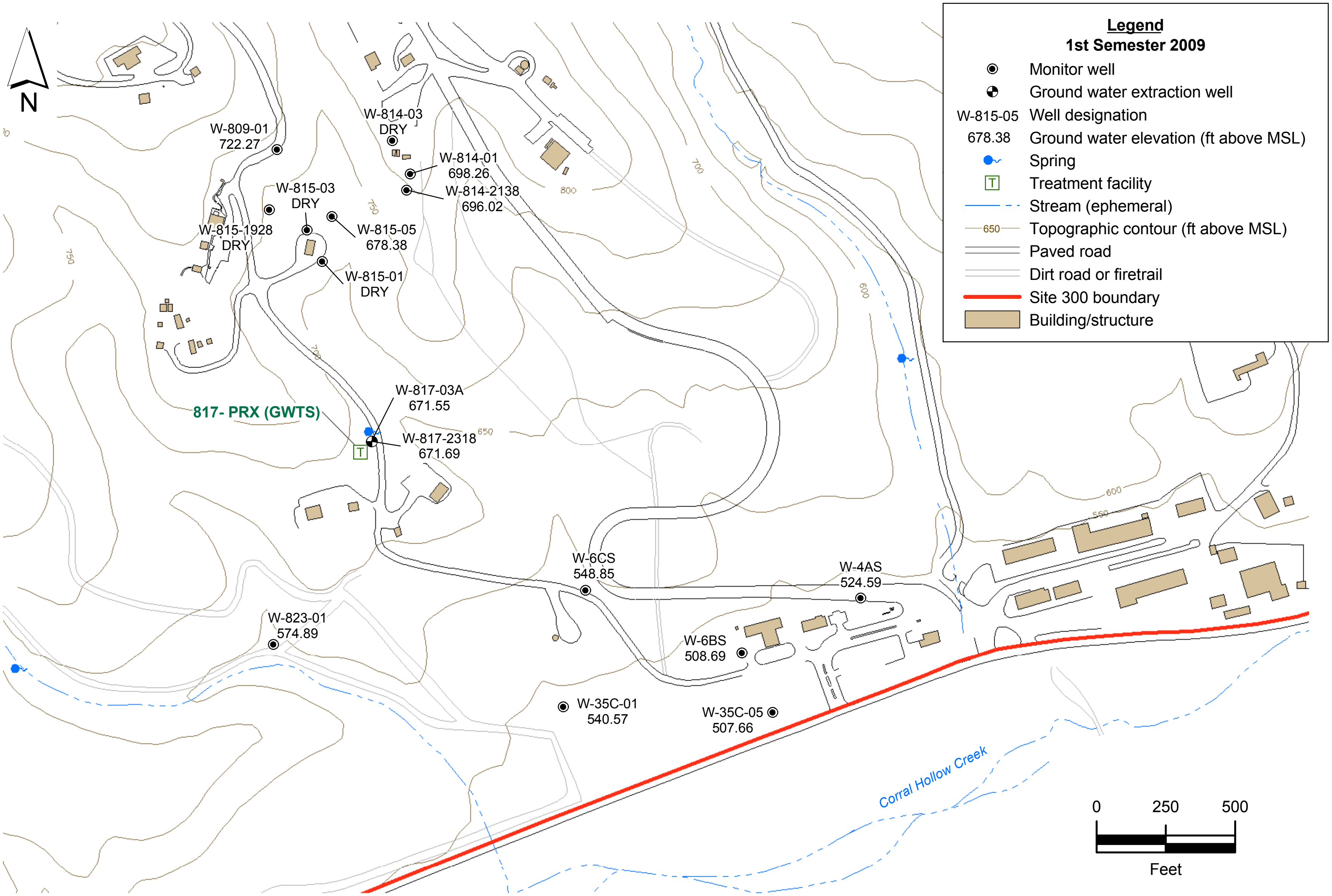


Figure 2.4-2. High Explosives Process Area OU map showing ground water elevations for the Tpsg-Tps HSU.

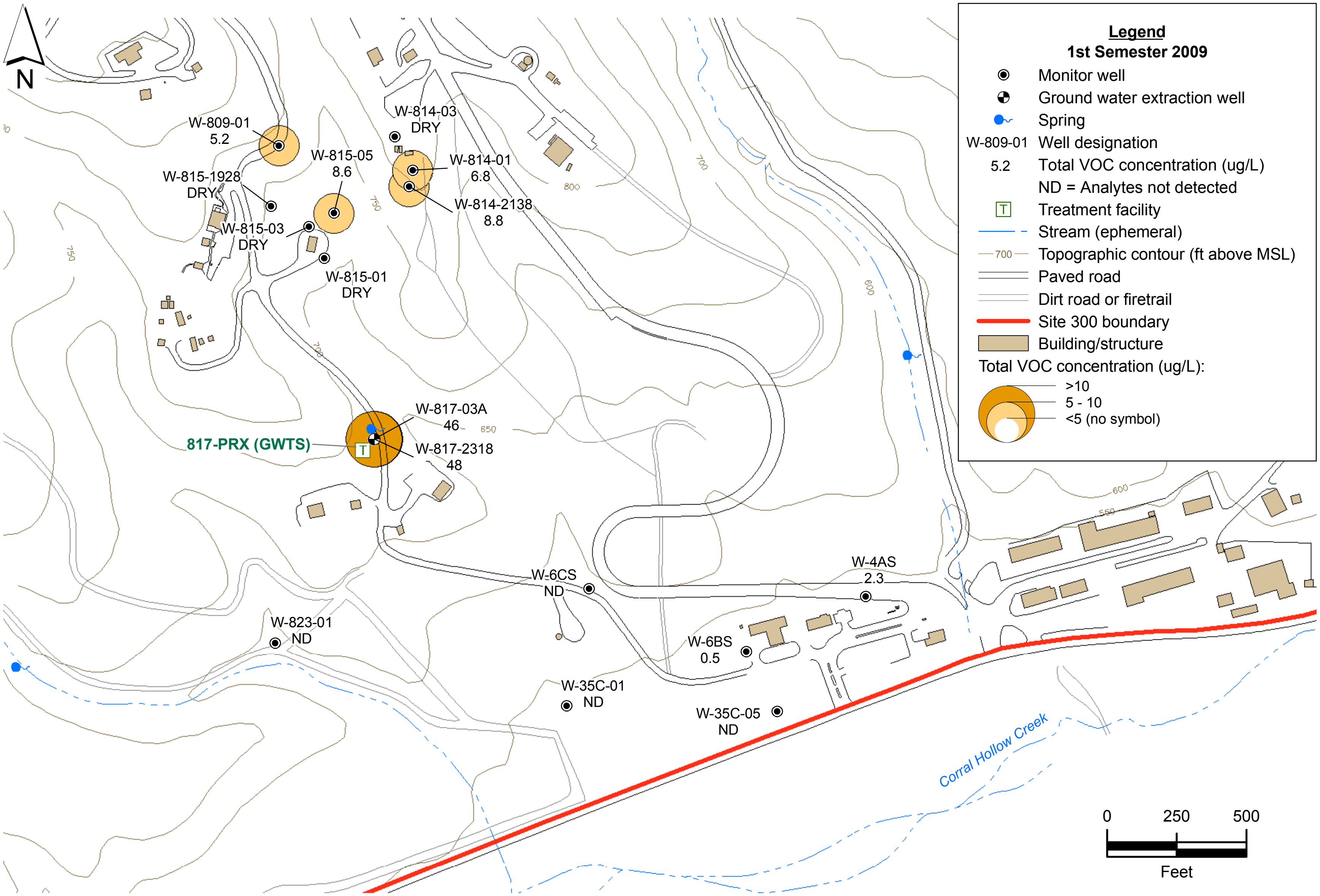


Figure 2.4-3. High Explosives Process Area OU map showing total VOC concentrations for the Tpsg-Tps HSU.

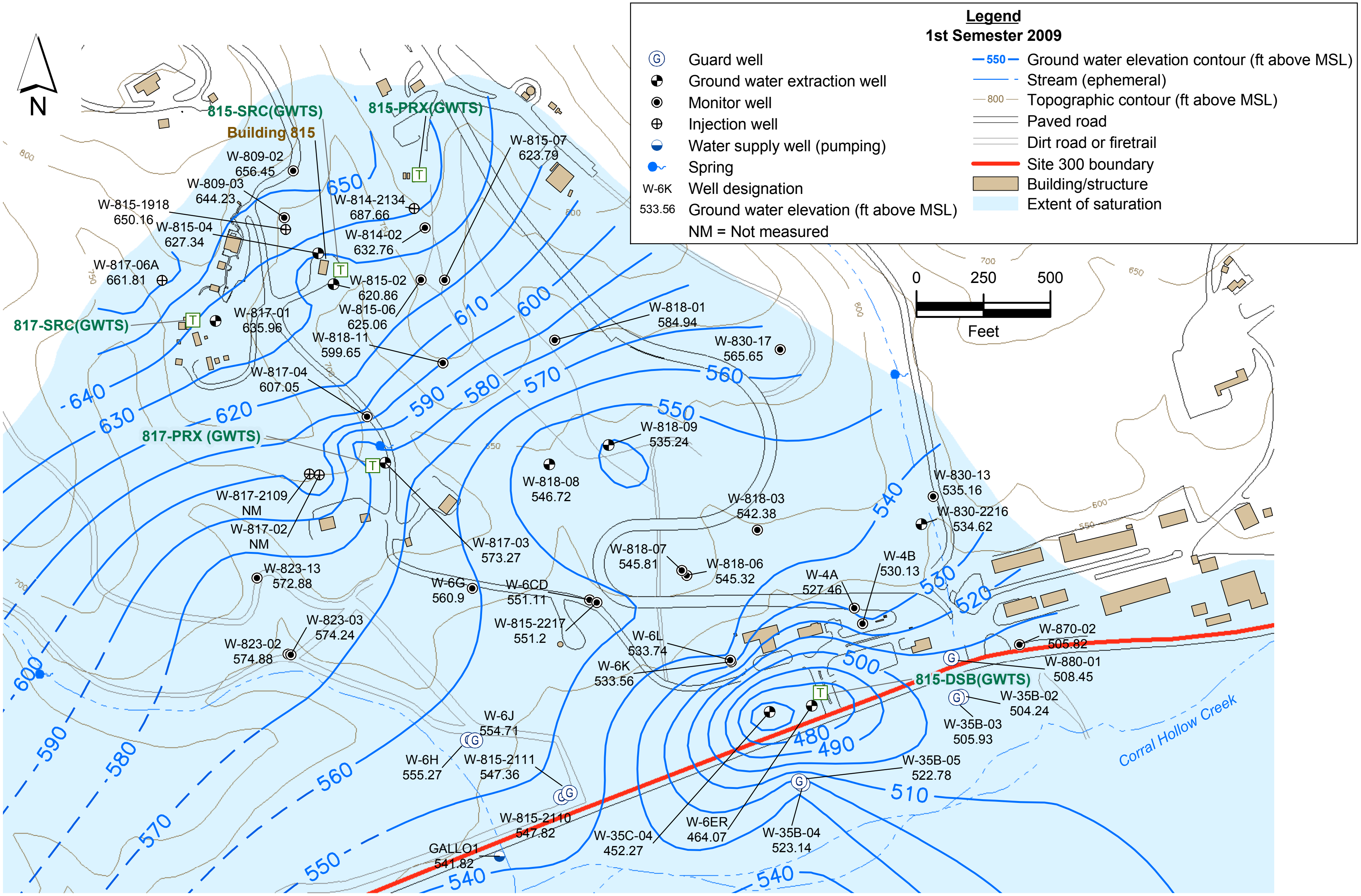
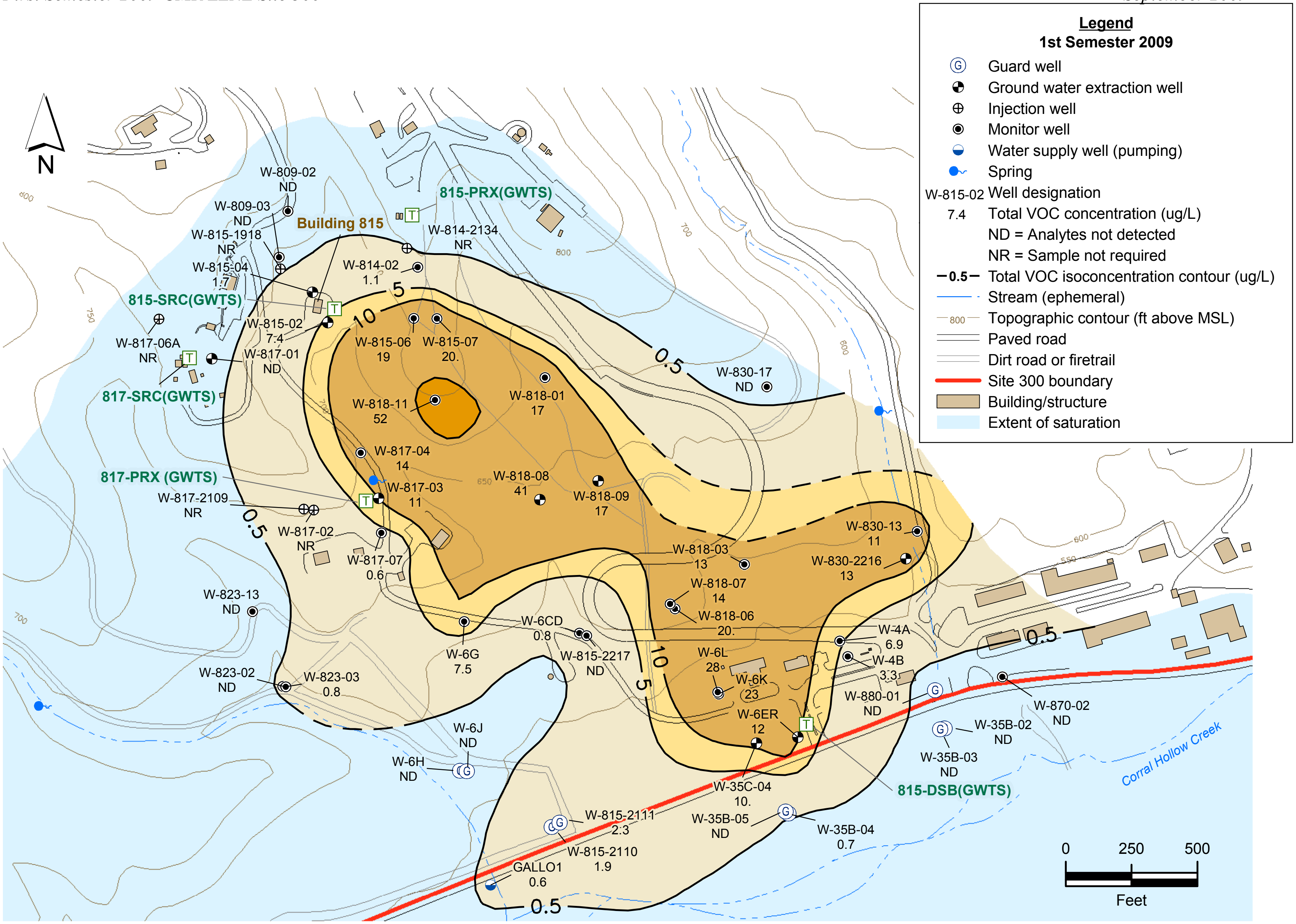


Figure 2.4-4. High Explosives Process Area OU ground water potentiometric surface map for the Tnbs$_2$ HSU.



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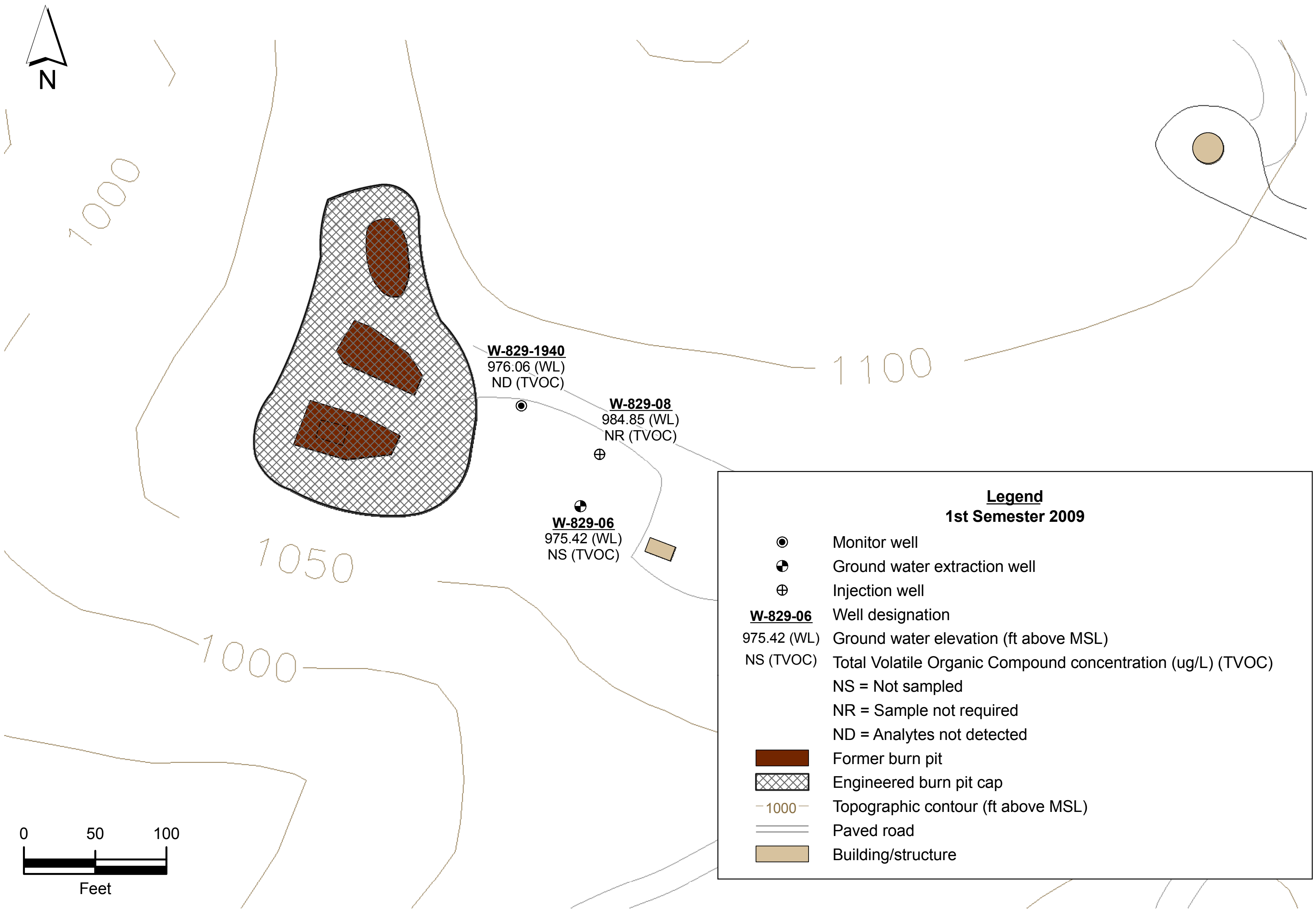

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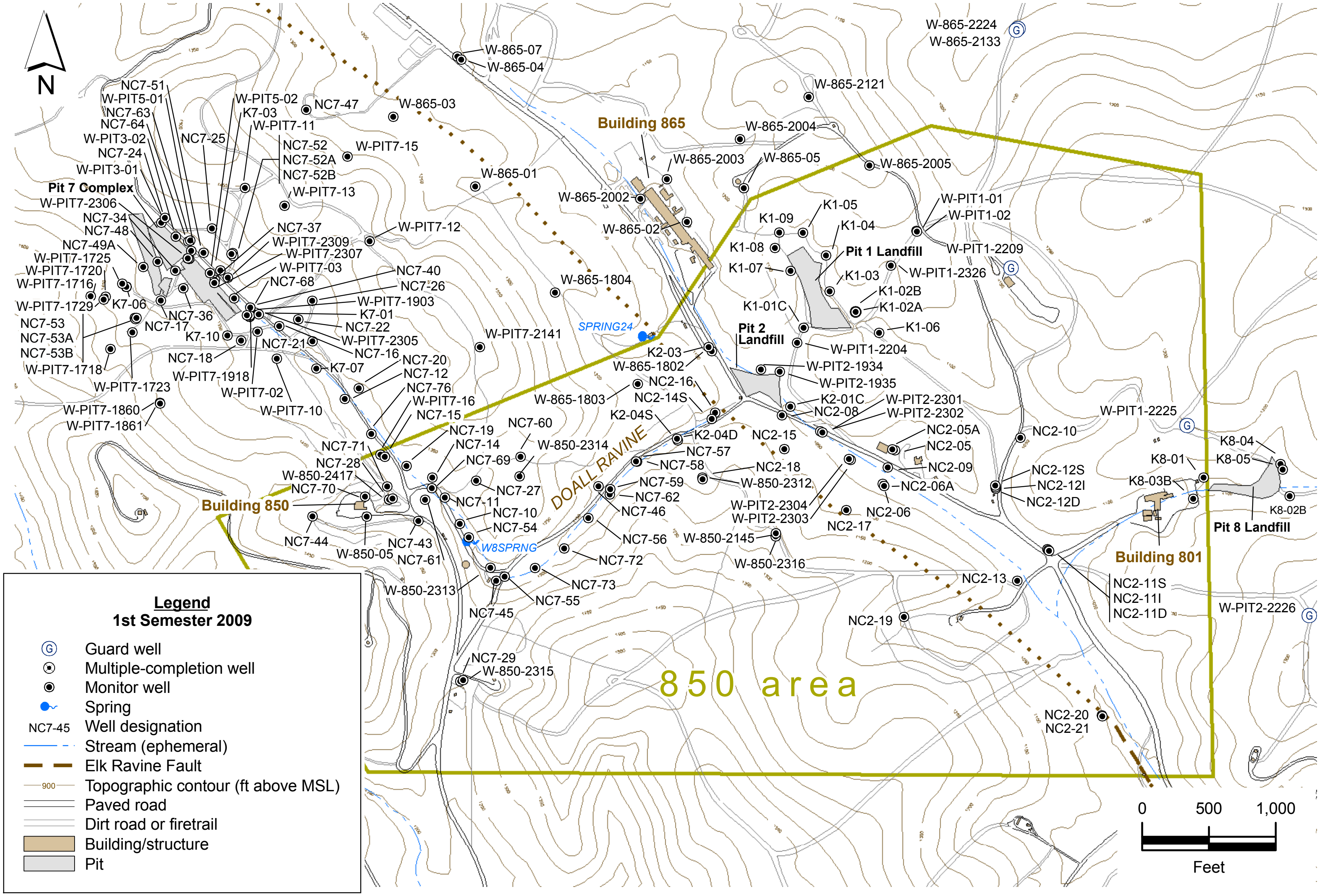

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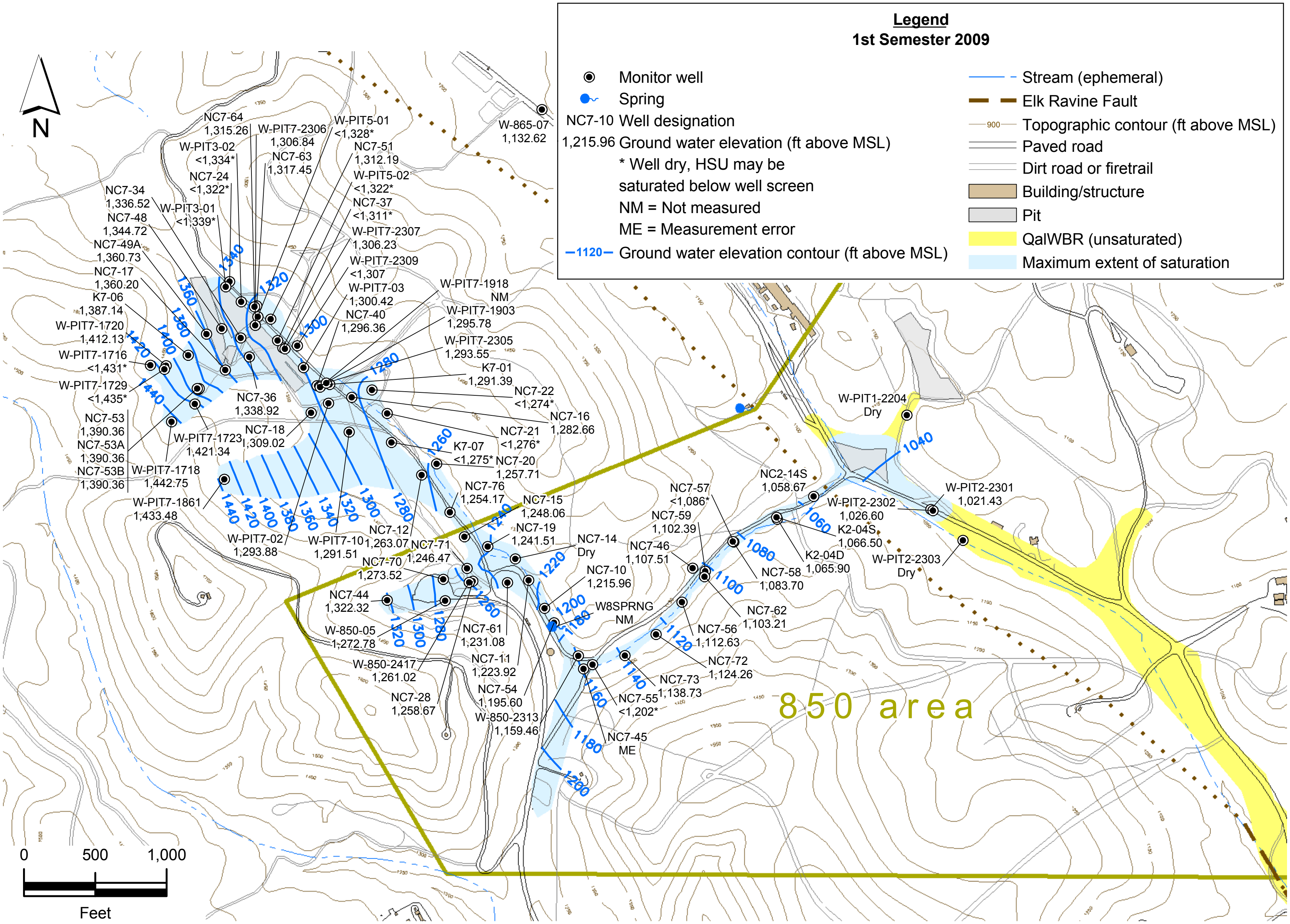

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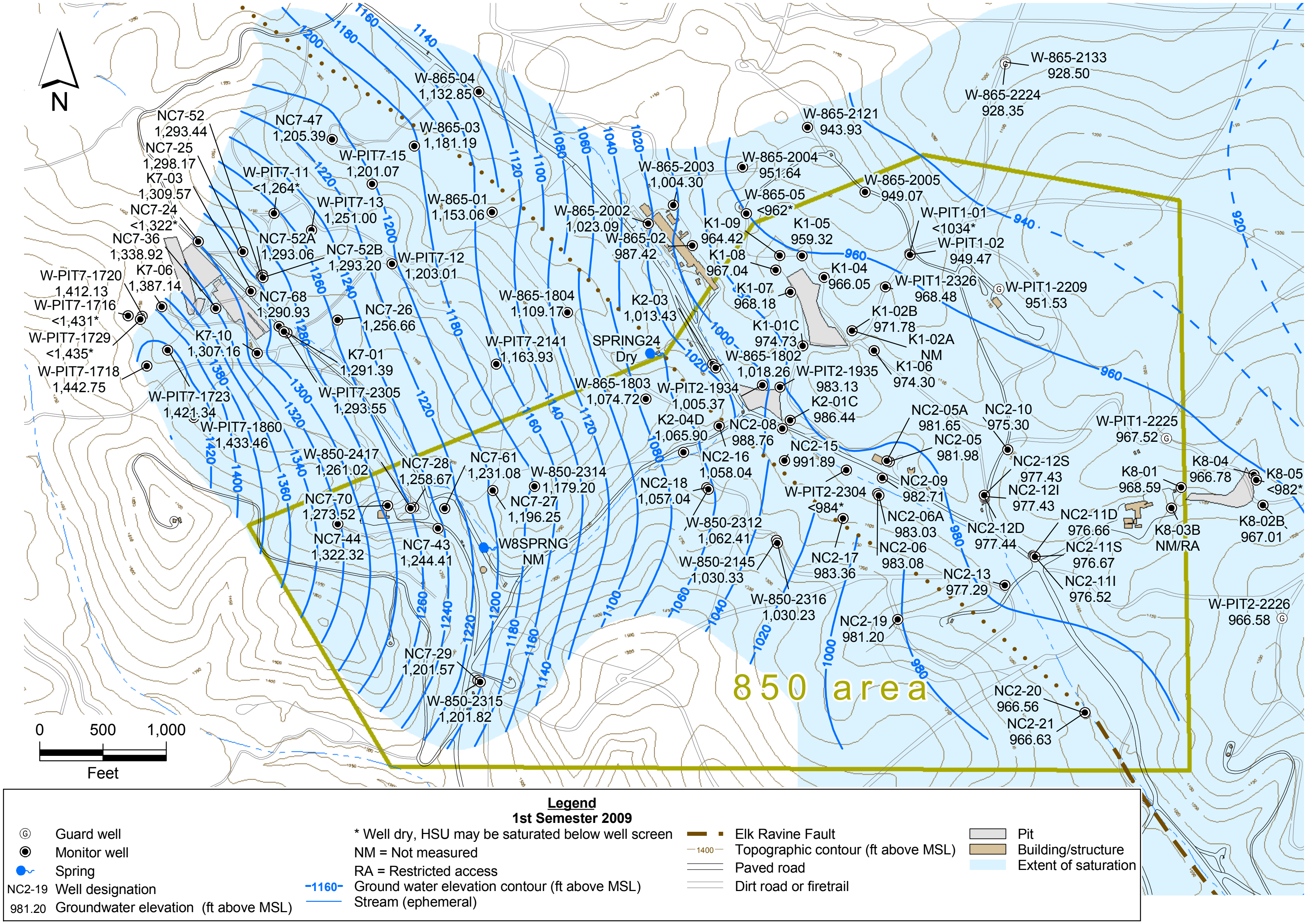

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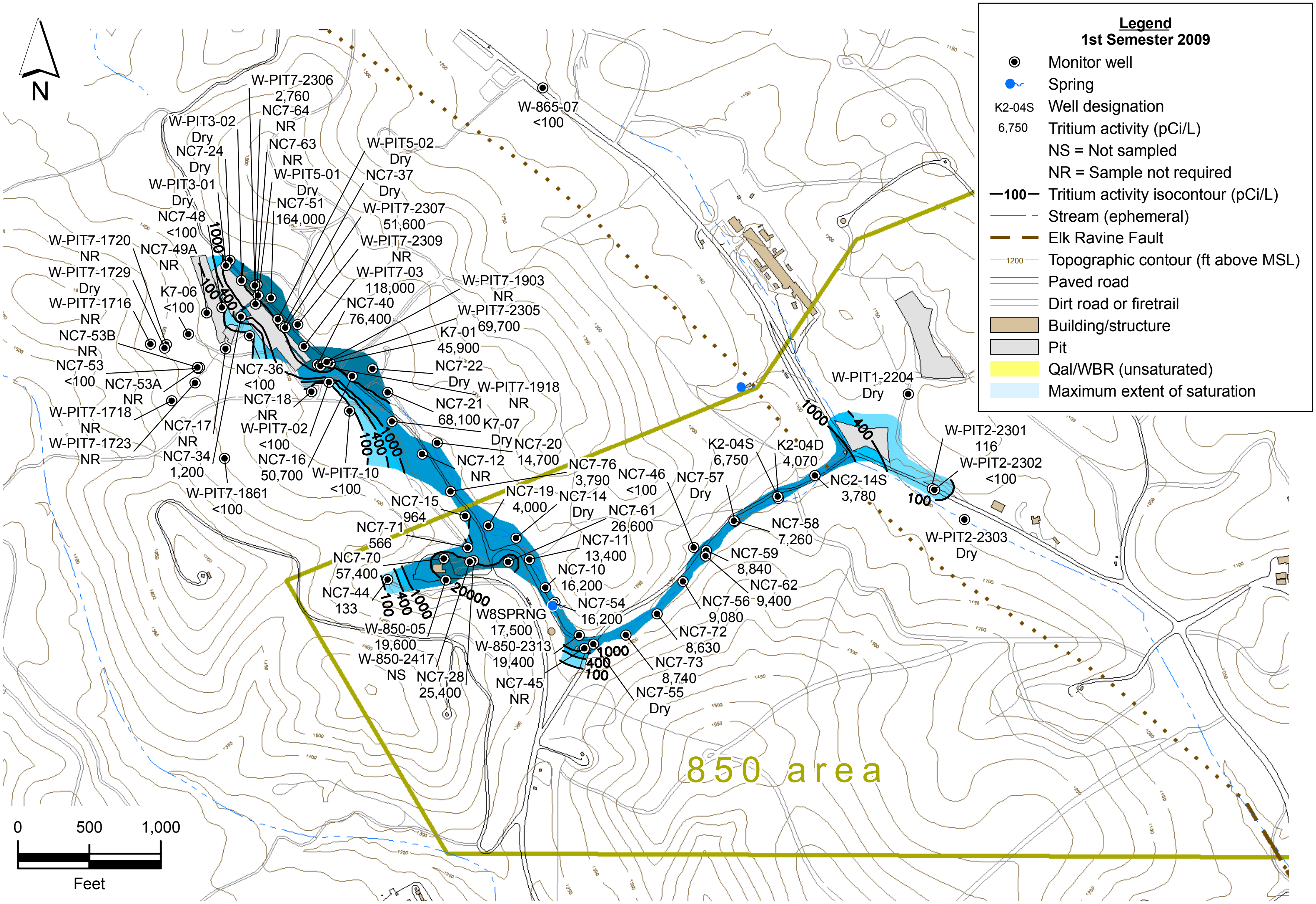

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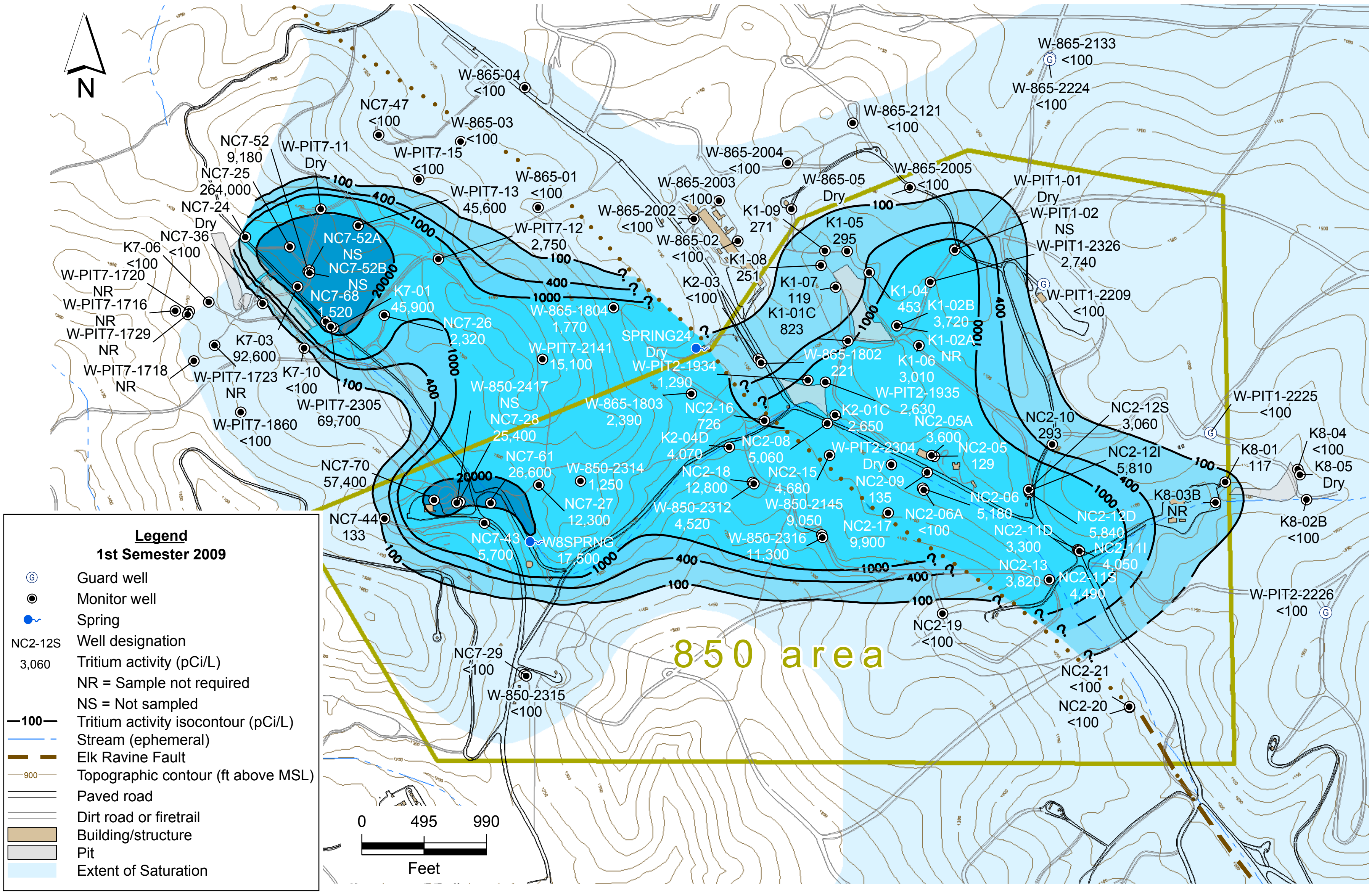

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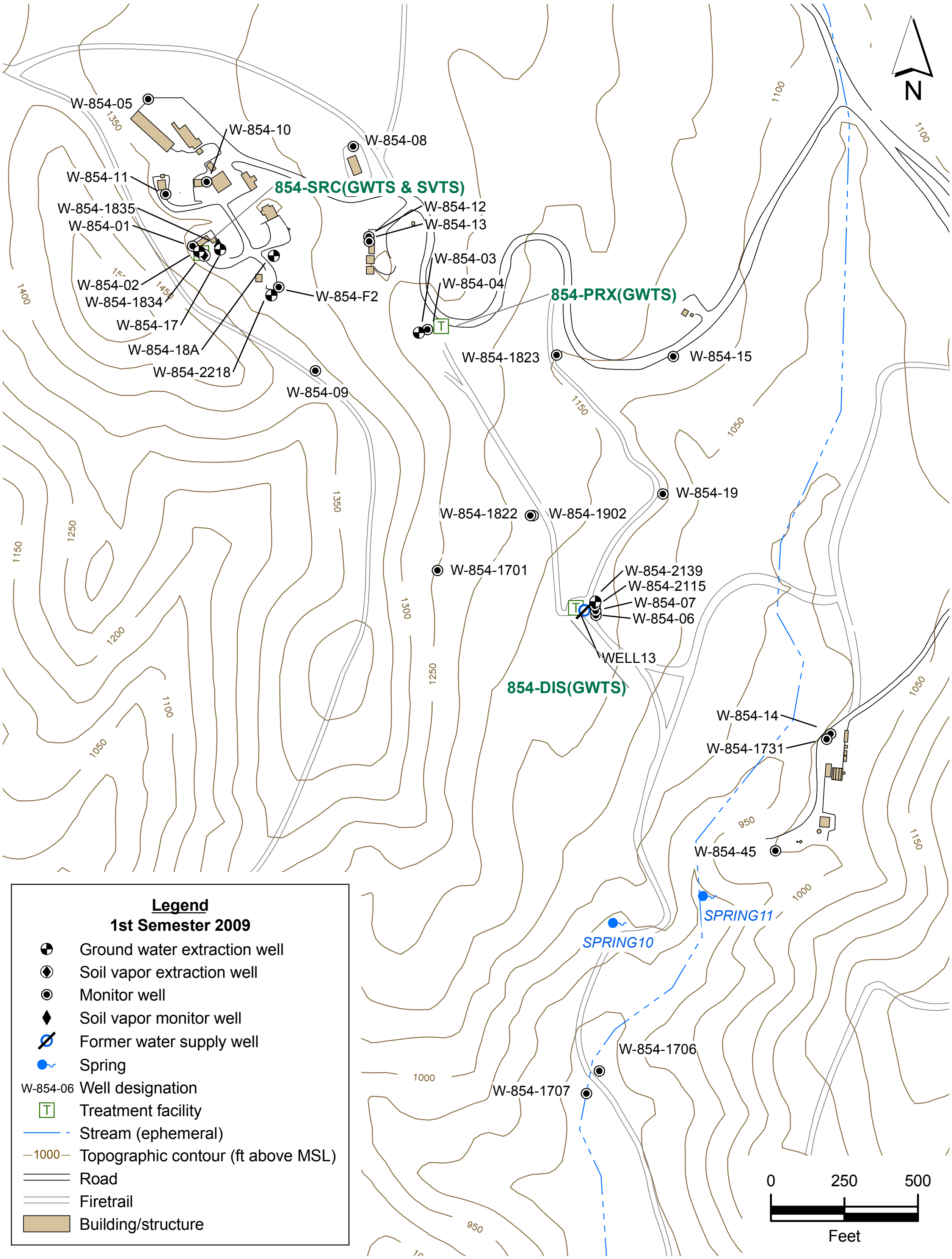

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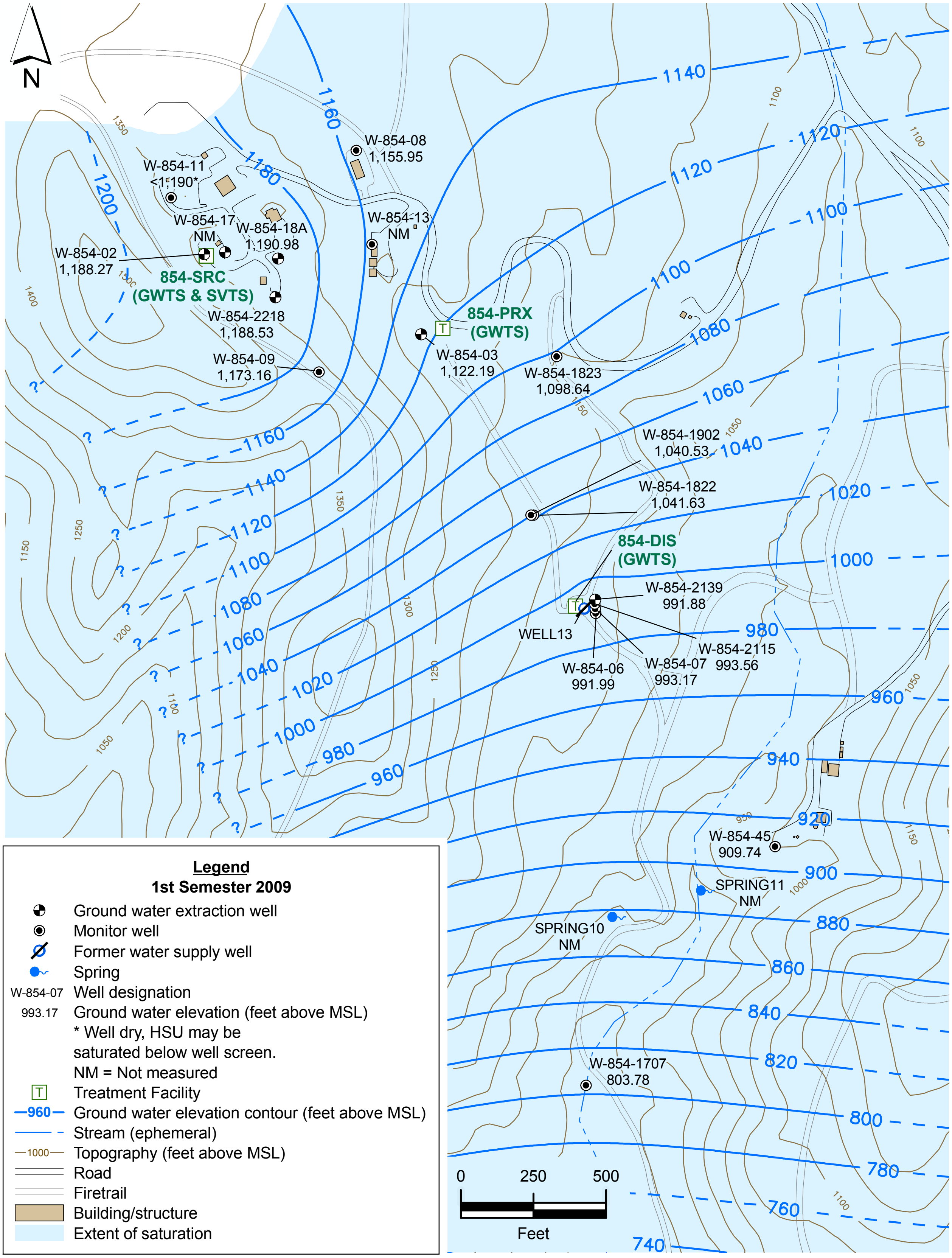

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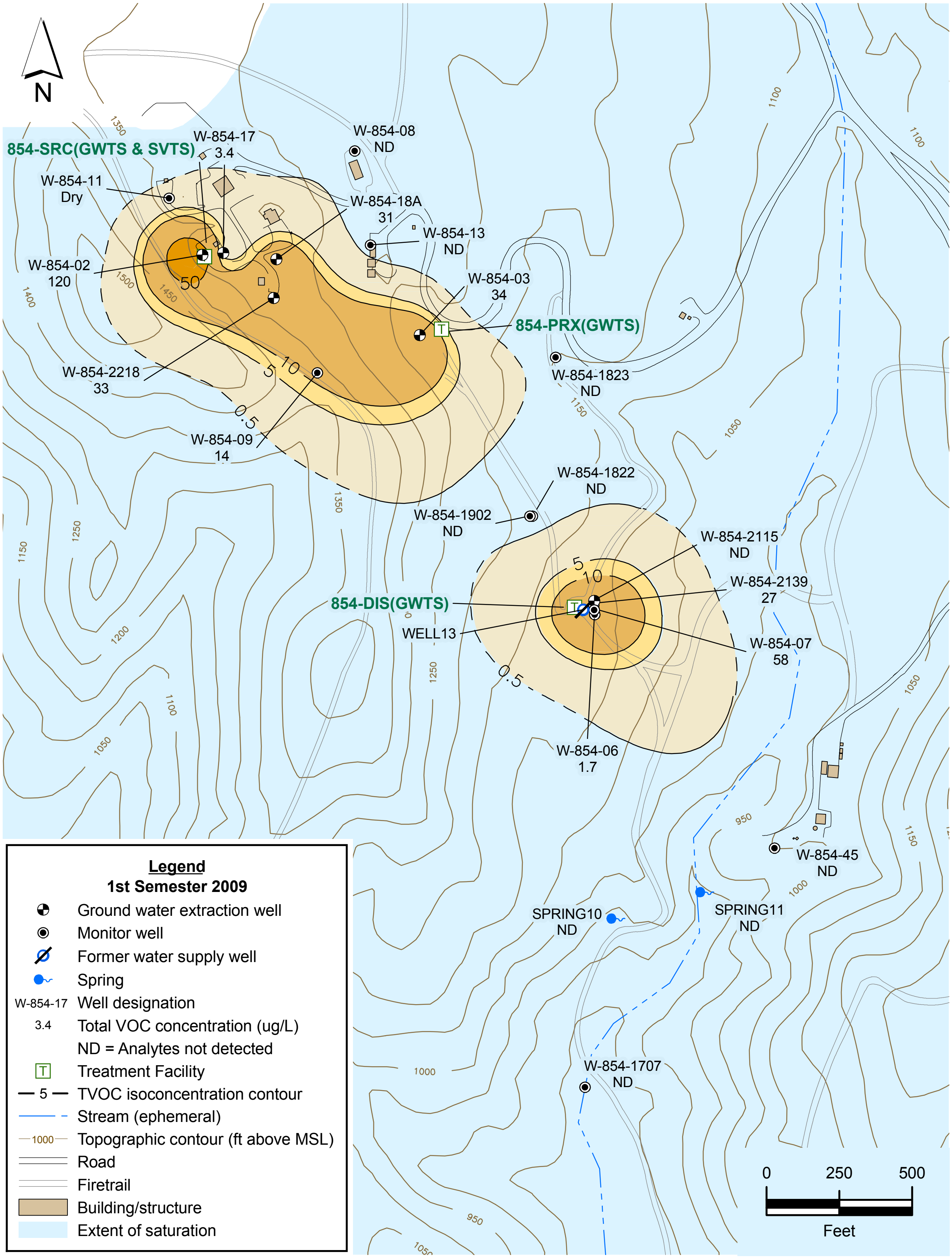

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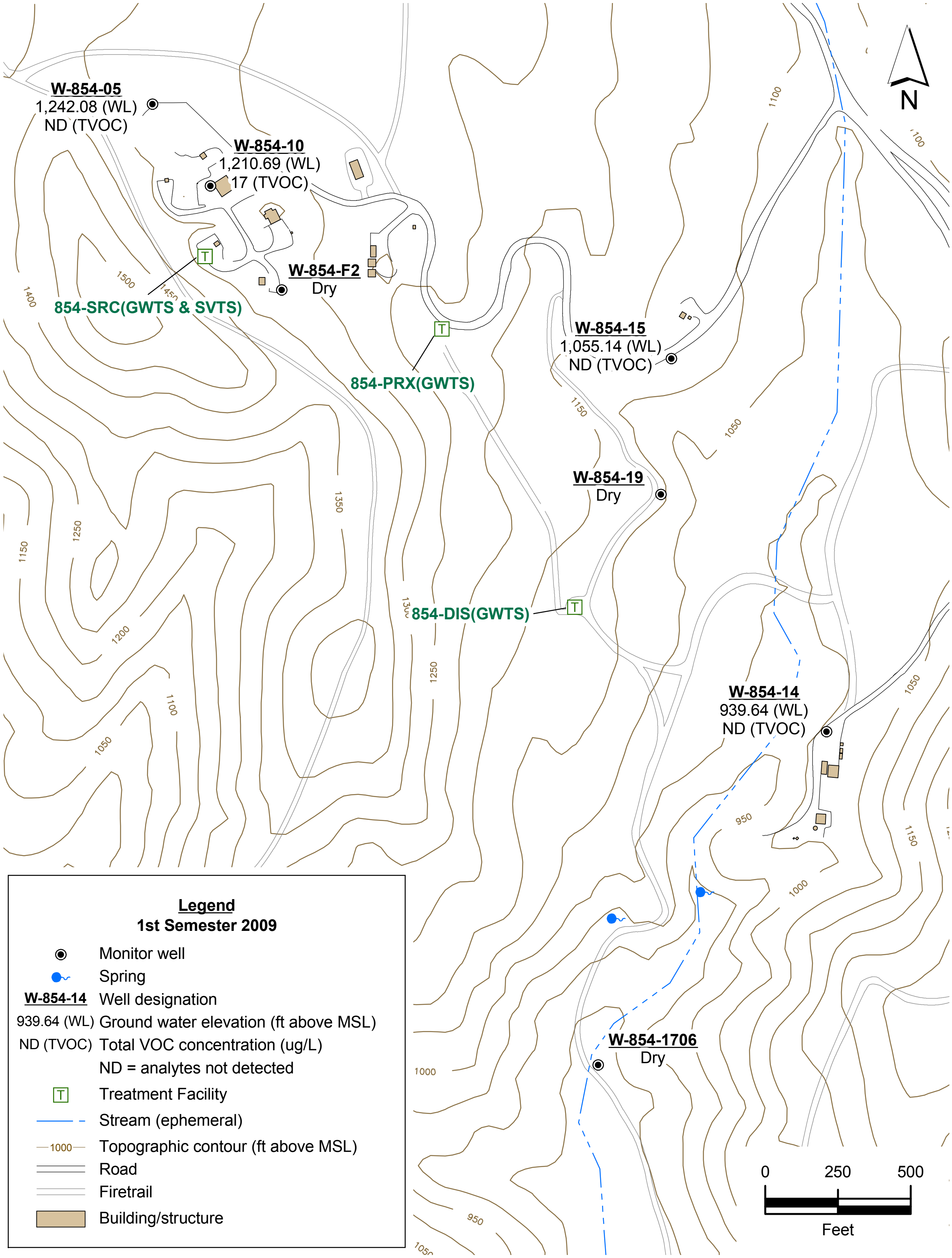

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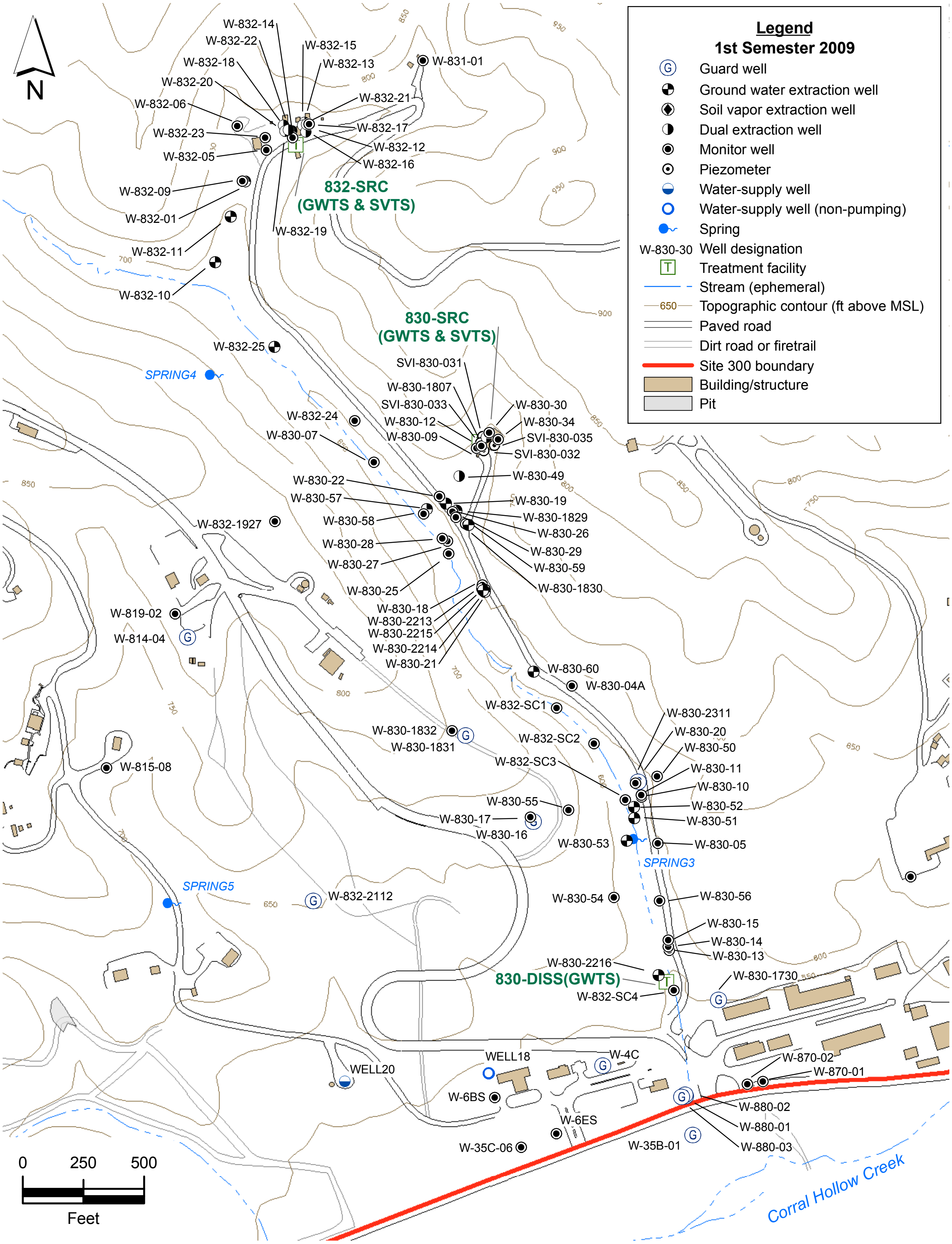

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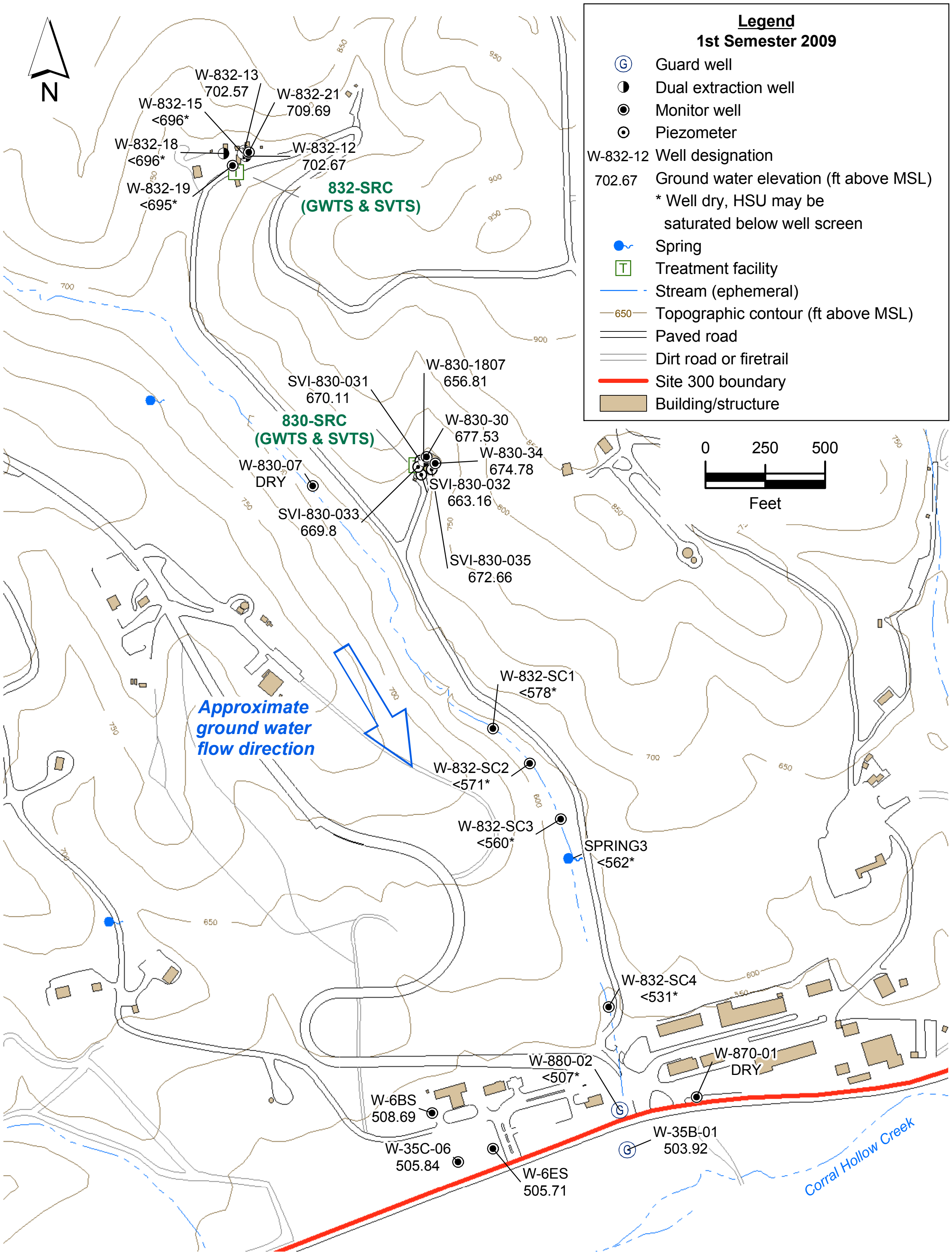

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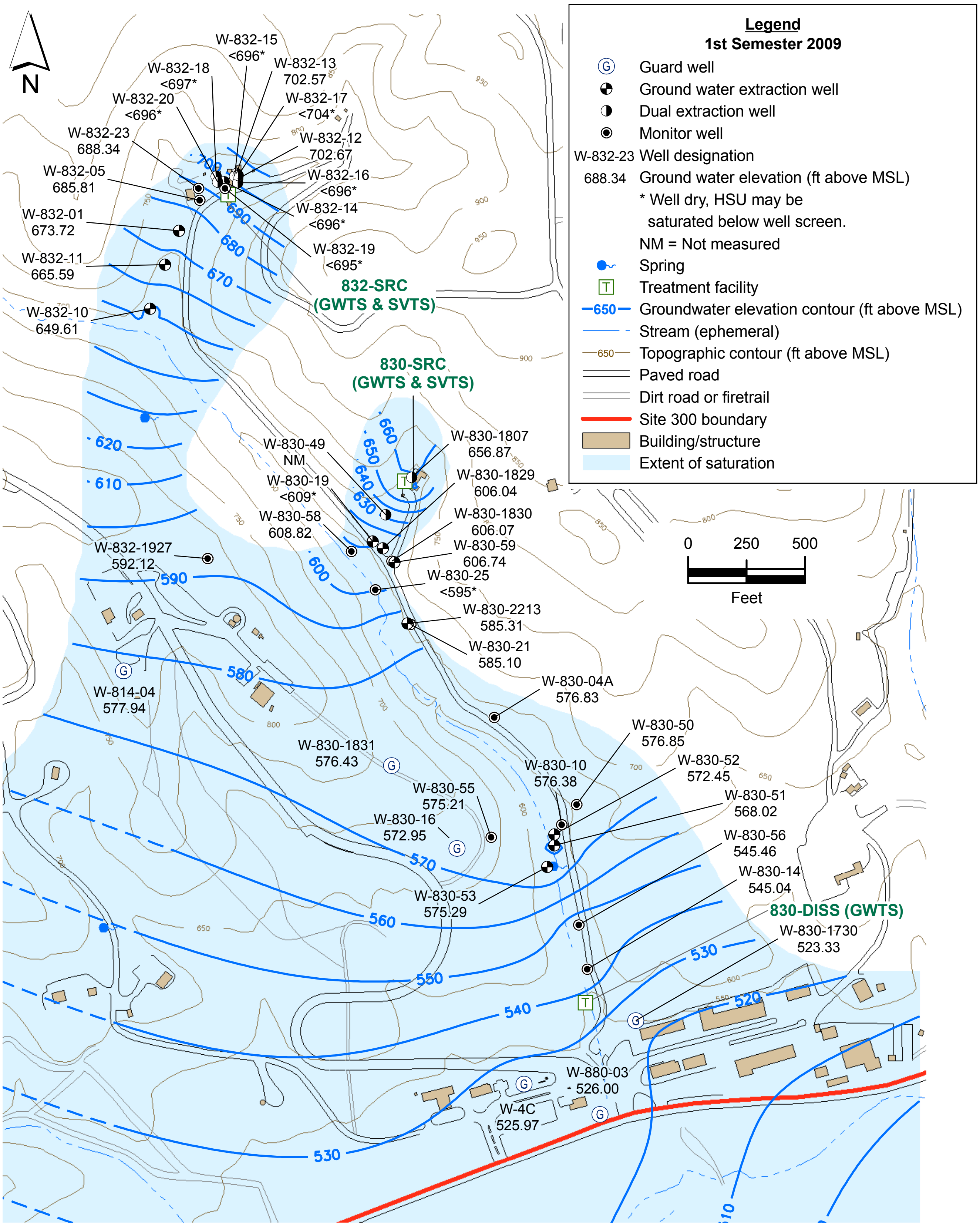

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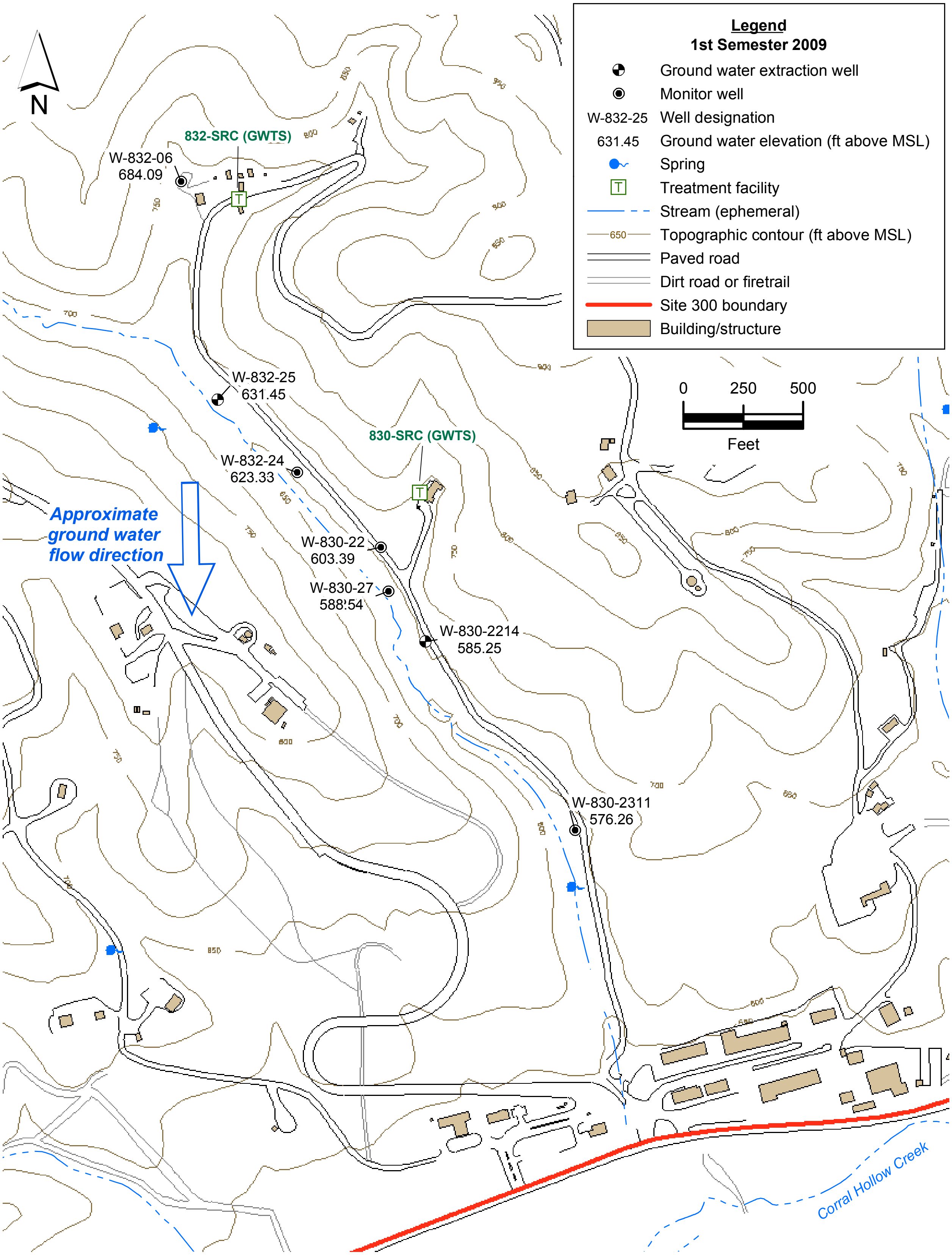

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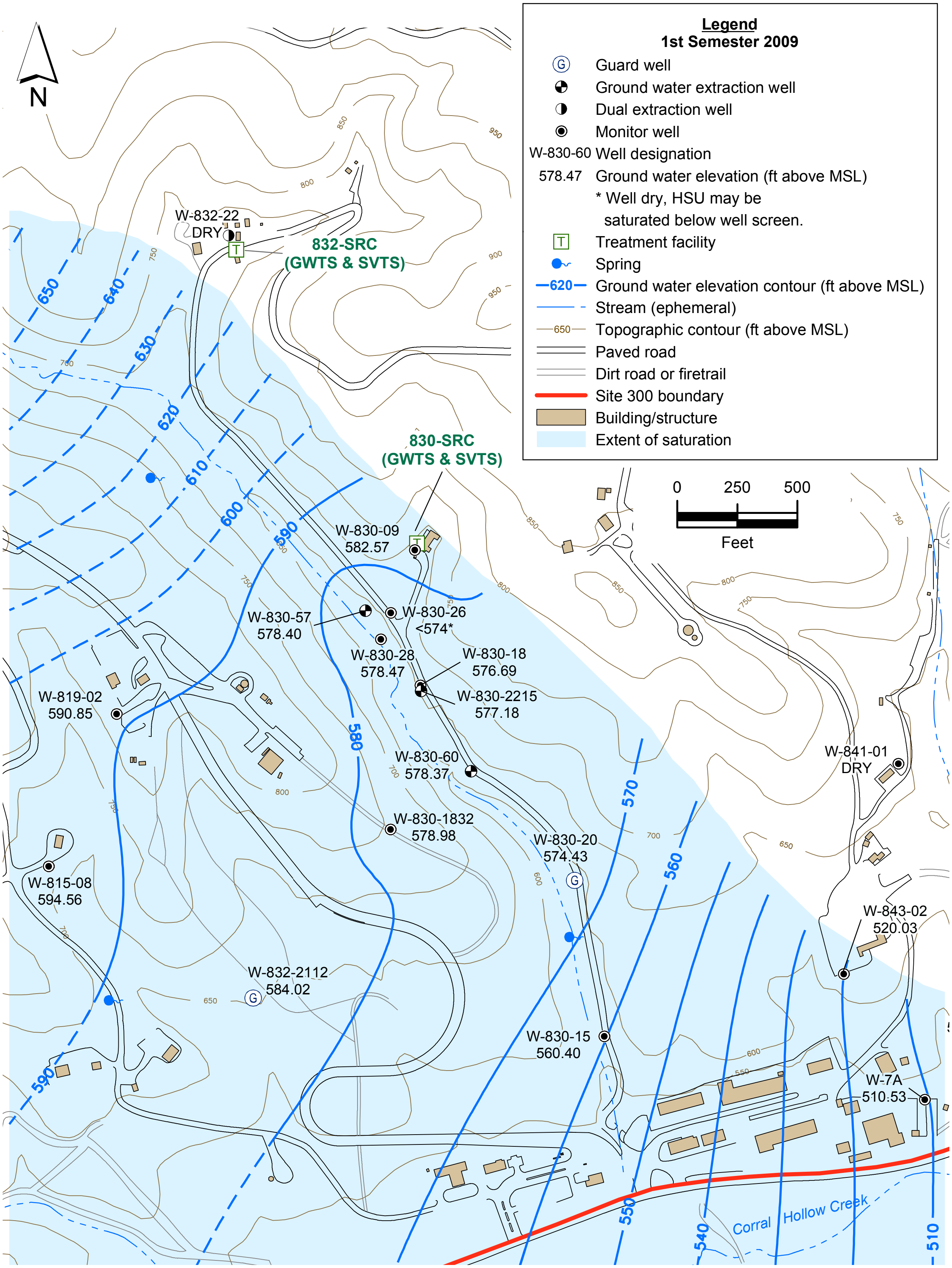

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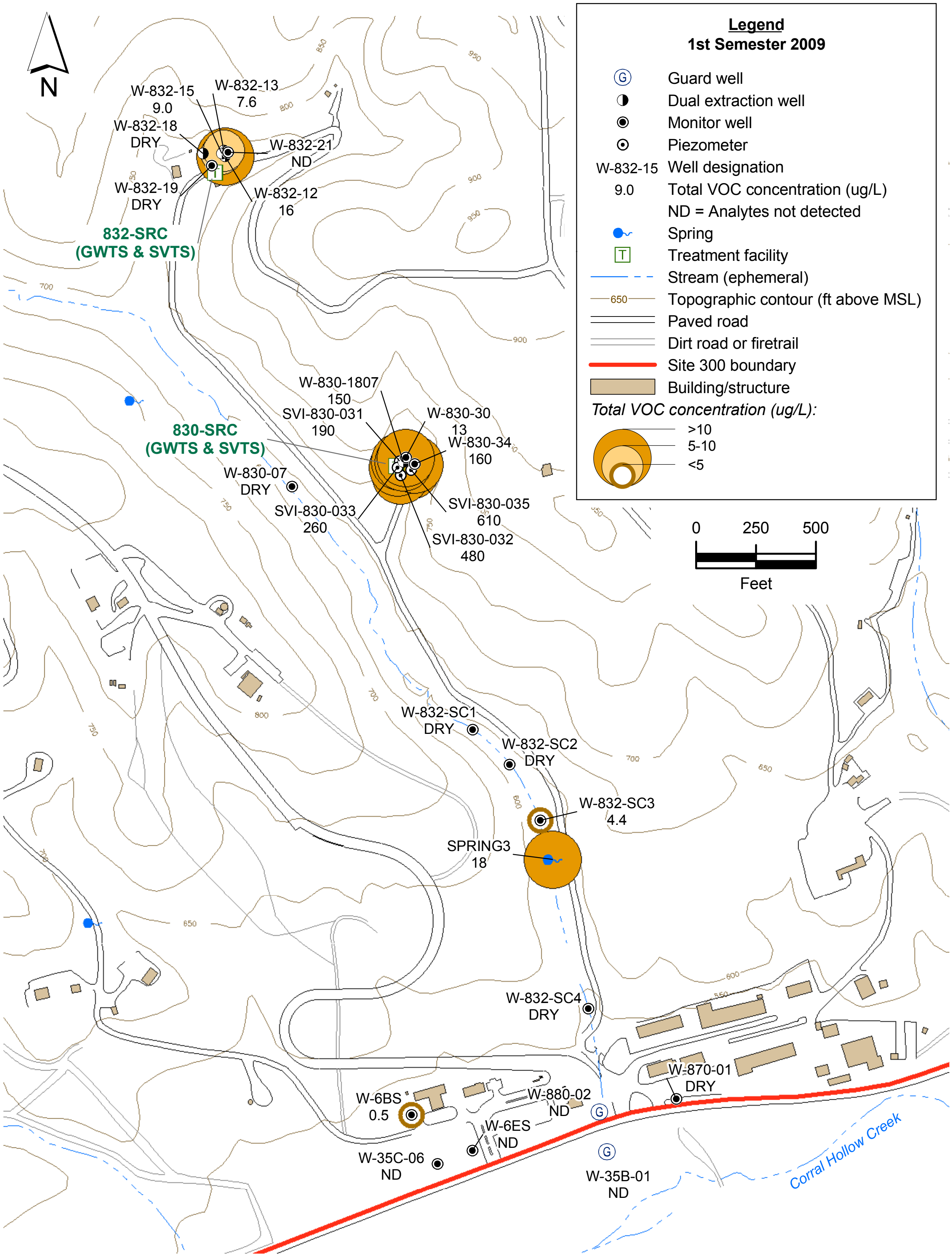

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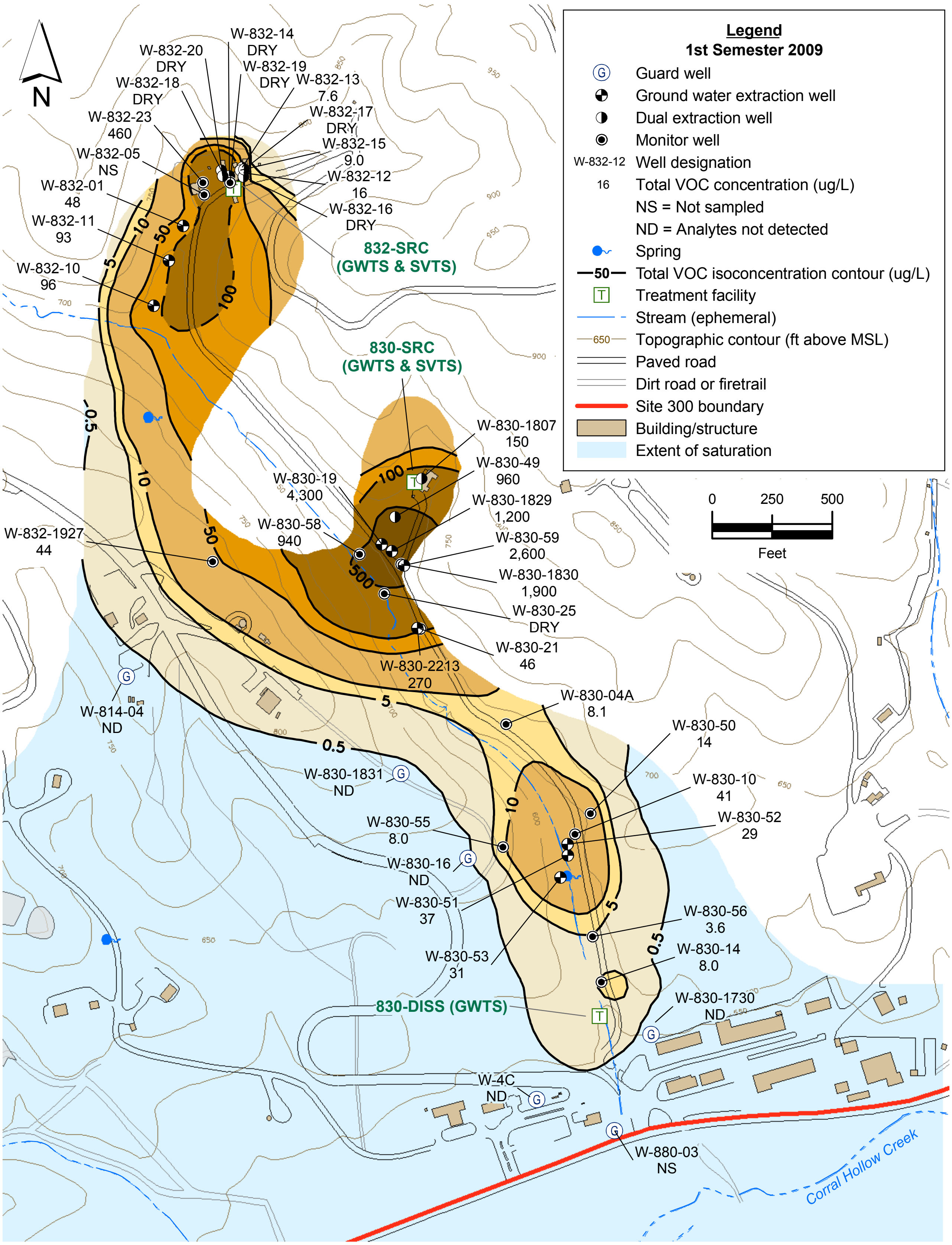

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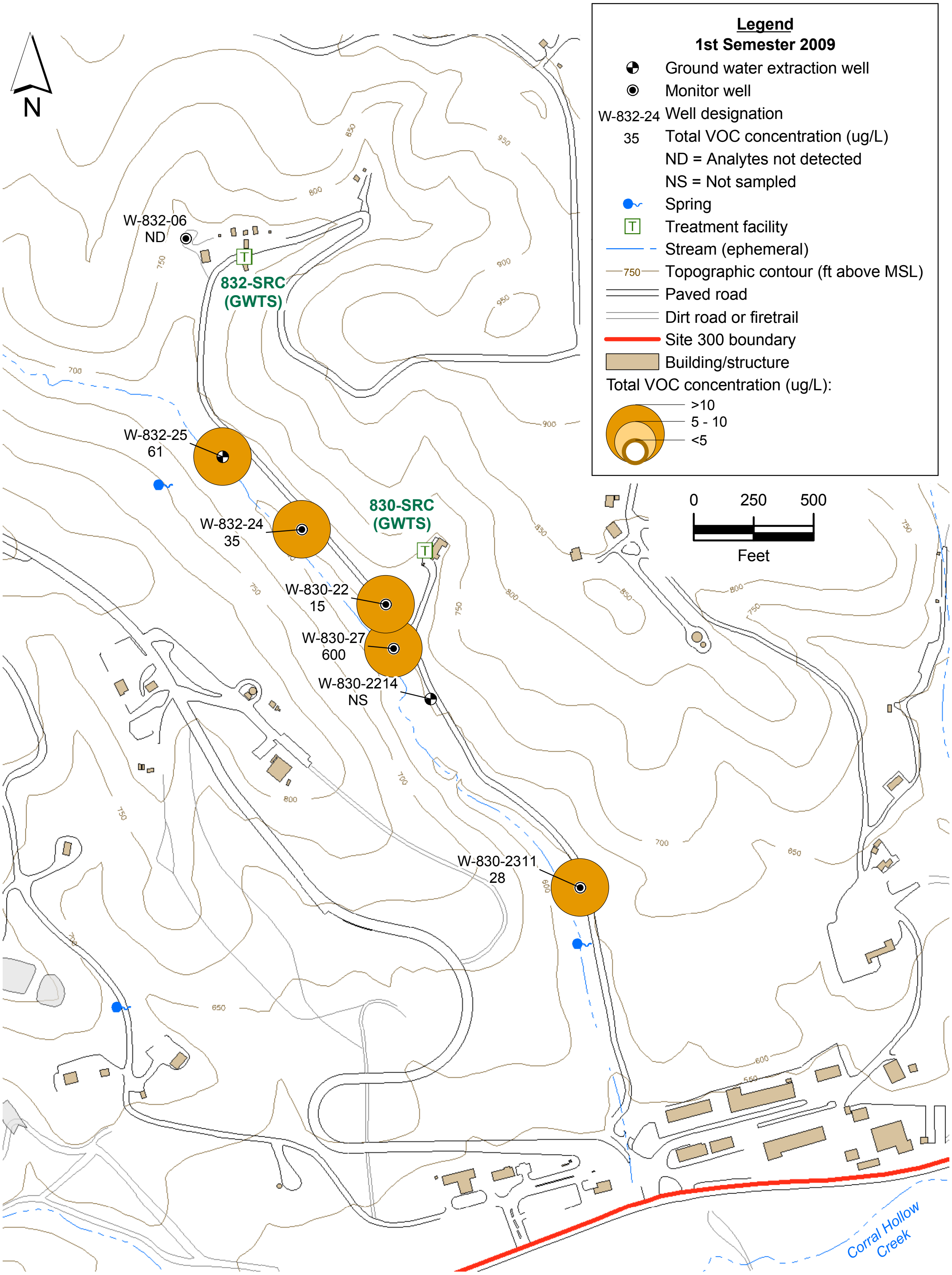

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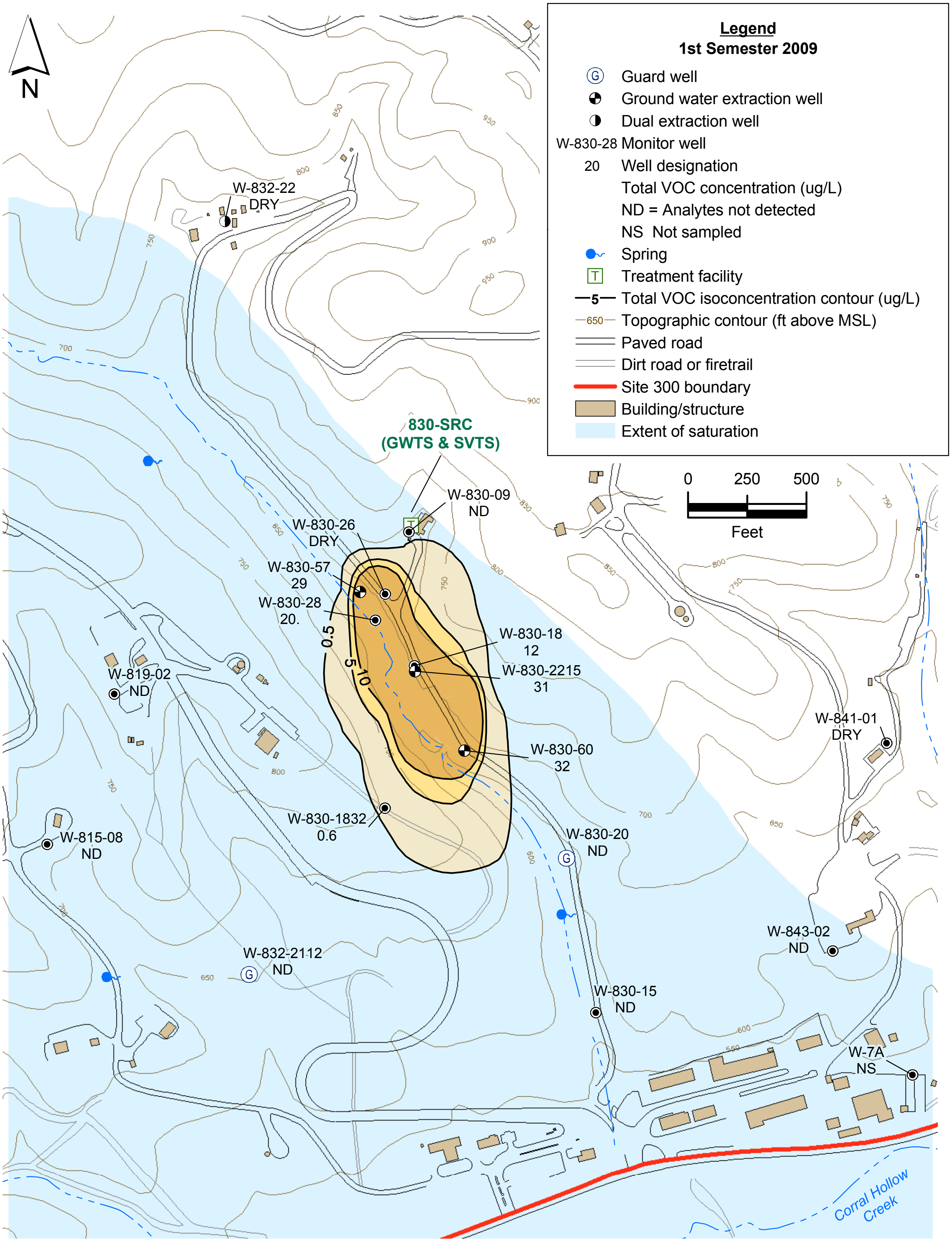

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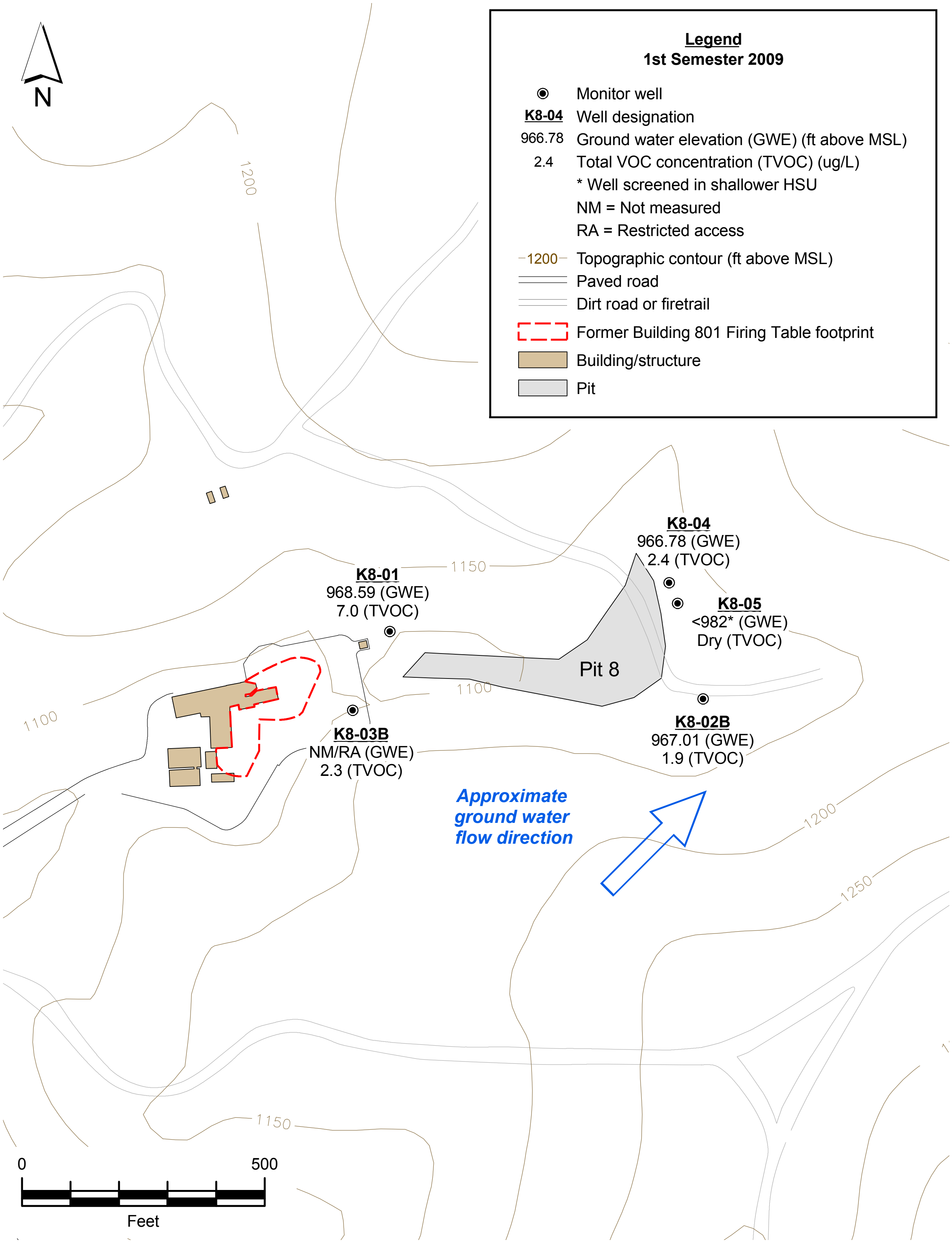

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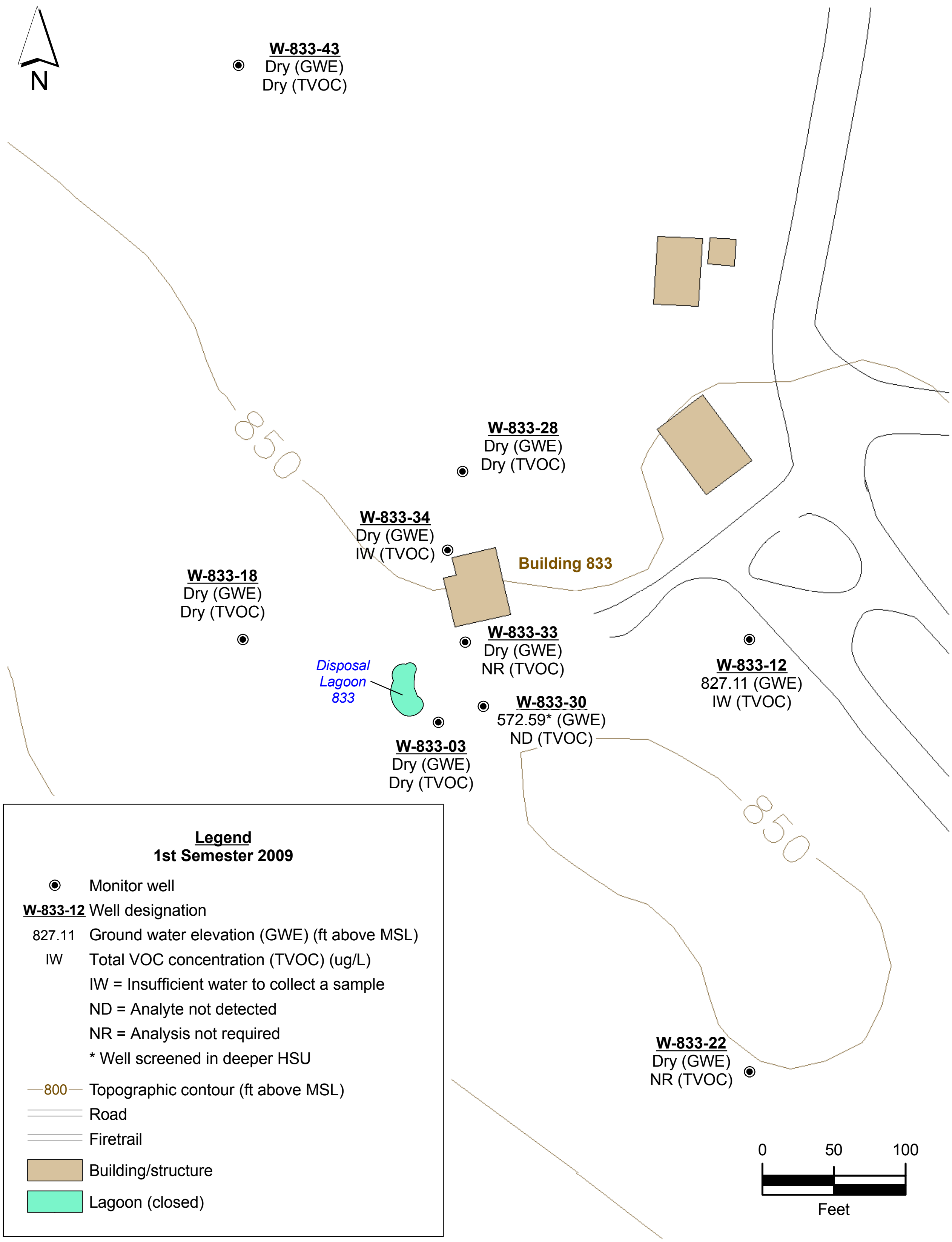

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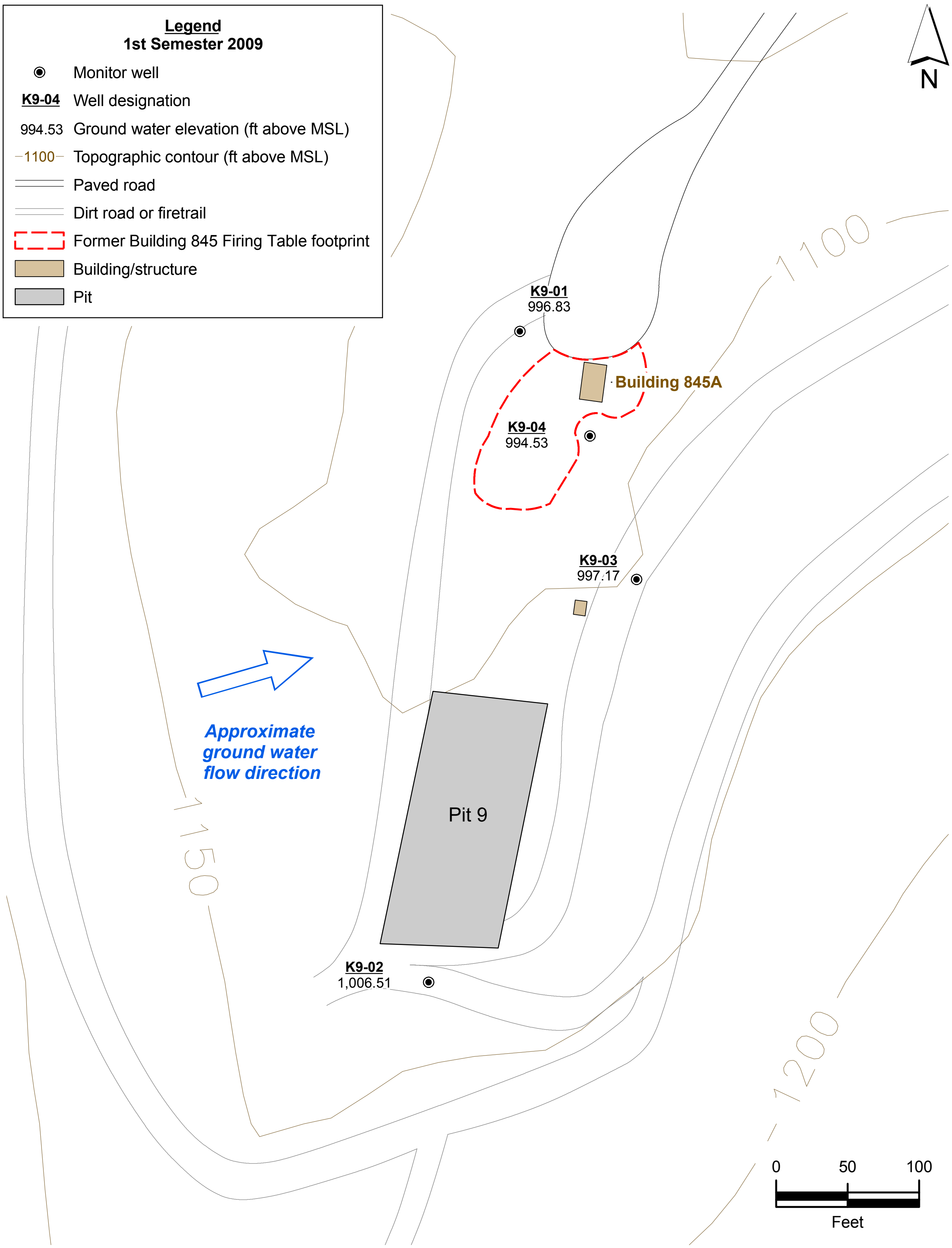

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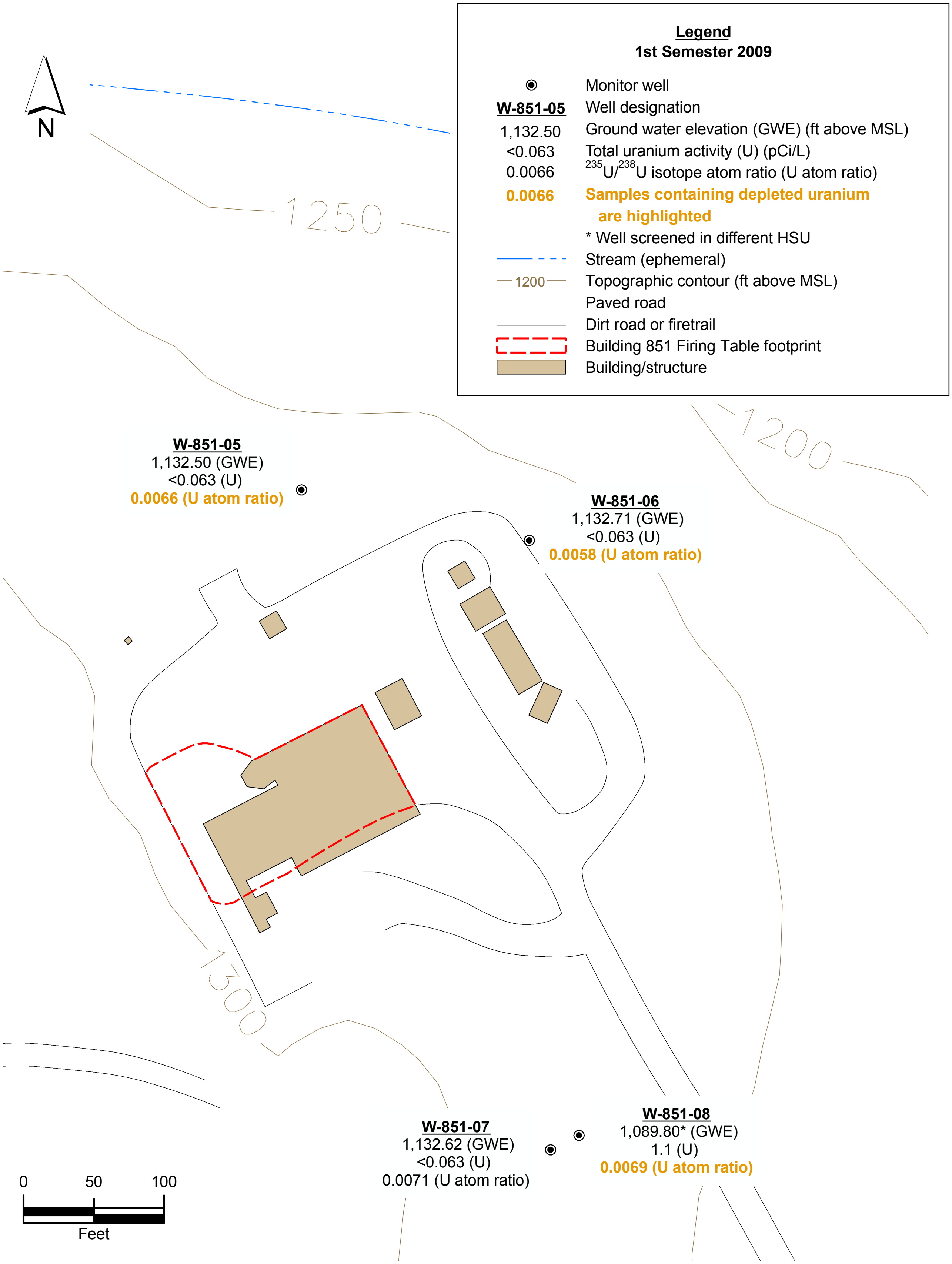

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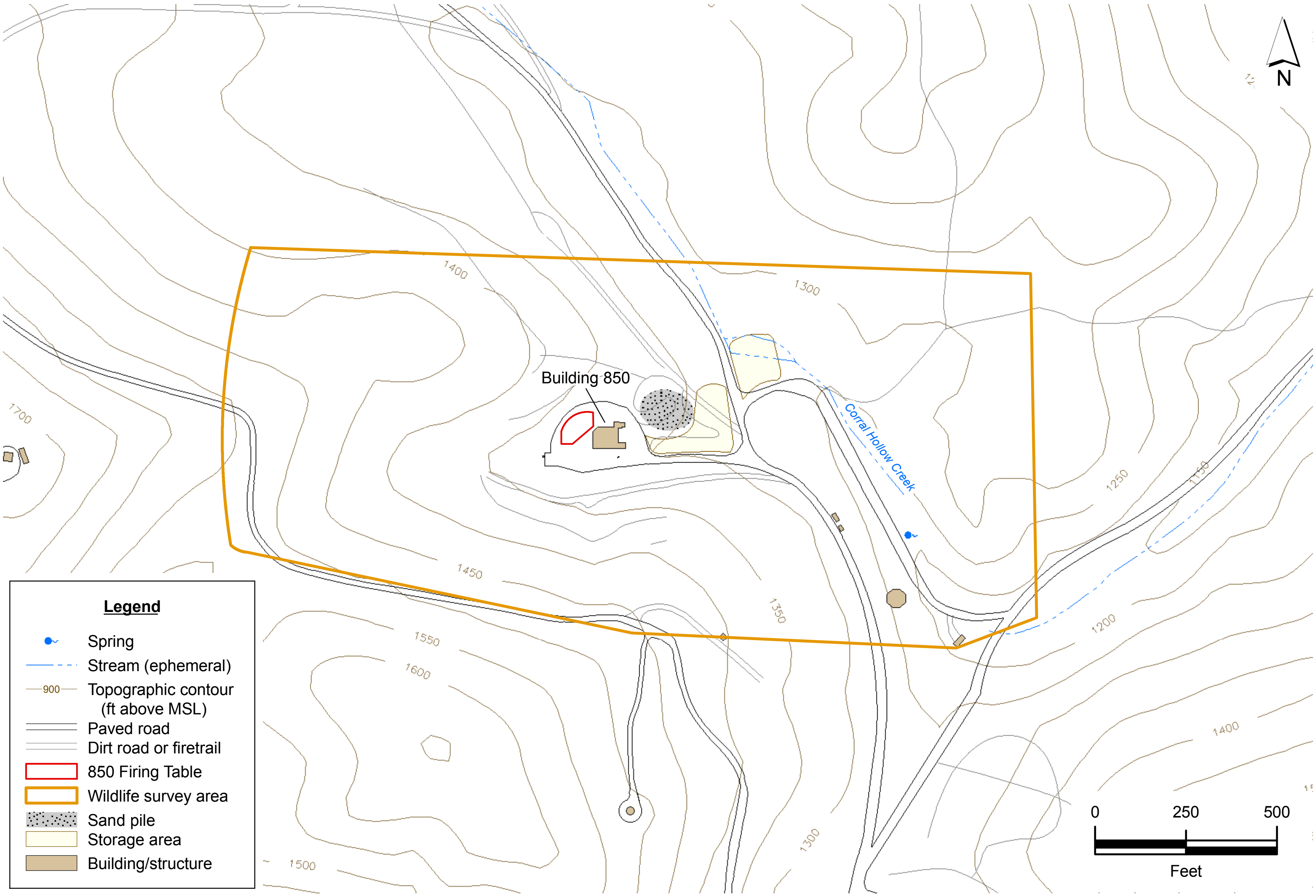

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Acronyms and Abbreviations

4-ADNT	4-Amino-2,6-dinitrotoluene
815	Building 815
817	Building 817
829	Building 829
832	Building 832
834	Building 834
850	Building 850
854	Building 854
A	Annual
As N	As nitrogen
As $CaCO_3$	As calcium carbonate
AUF	Area use factor
B	Biennial
BTEX	Benzene, toluene, ethyl benzene, and xylene
°C	Degrees Celsius
C12-C24	Diesel range organic compounds in the carbon 12 to carbon 24 range
CDFG	California Department of Fish and Game
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
cfm	Cubic feet per minute
CFV2	Second vapor phase granular activated carbon filter effluent
CGSA	Central General Services Area
CHC	Corral hollow creek
CMP/CP	Compliance Monitoring Plan/Contingency Plan
CMR	Compliance Monitoring Report
COC	Contaminants of Concern
DCA	Dichloroethane
DCE	Dichloroethylene or dichloroethene
DIS	Discretionary sampling (not required by the CMP)
DISS	Distal south
DMW	Detection monitor well
DNB	Dinitrobenzene
DNT	Dinitrotoluene
DOE	Department of Energy
DSB	Distal Site Boundary
DTSC	Department of Toxic Substances Control

DUP	Duplicate or collocated QC sample
E	Effluent
EGSA	Eastern General Services Area
EIR/EIS	Environmental Impact Report/Draft Environmental Impact Statement
EPA	Environmental Protection Agency
ERD	Environmental Restoration Department
ES&H	Environmental Safety and Health
EV	Effluent vapor
EW	Extraction well
ft	Feet
ft^3	Cubic feet
g	Gram(s)
GAC	Granular activated carbon
gal	gallon(s)
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
ITS	Issues Tracking System
IV	Influent vapor
IW	Injection well
kg	kilograms
km	Kilometers
Kow	High log octanol-water partition coefficient
lb	Pounds
LHC	Light hydrocarbon
LLNL	Lawrence Livermore National Laboratory
µg/L	Micrograms per liter
$\mu g/m^3$	Micrograms per meters cubed
µmhos/cm	Micro ohms per centimeter
µS	Microsiemens
M	Monthly
MCL	Maximum Contaminant Level
mg/L	Milligrams per liter

MNA	Monitored Natural Attenuation
MTU	Miniature Treatment Unit
mv	Millivolts
MWB	Monitor well used for background
N	No
NB	Nitrobenzene
NO_3	Nitrate
NA	Not applicable
NT	Nitrotoluene
NTU	Nephelometric turbidity units
ORP	Oxidation/reduction potential
OU	Operable unit
O&M	Operations and Maintenance
PCBs	Polychlorinated biphenyls
PCE	Tetrachloroethylene
pCi/L	PicoCuries per liter
pH	A measure of the acidity or alkalinity of an aqueous solution
PHG	Public Health Goal
ppb_v	Parts per billion by volume
ppm_v	Parts per million on a volume-to-volume basis
PRX	Proximal
PRXN	Proximal north
PSDMP	Post-Monitoring Shutdown Plan
PTMW	Plume Tracking Monitor Well
Q	Quarterly
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
RDX	Research Department explosive
REA	Reanalysis
REX	Resample
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
S	Semi-annual
Scfm	Standard cubic feet per minute
SOP	Standard Operating Procedure
SRC	Source
SPR	Spring
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
TCA	Trichloroethane
TKEBS	Tetrakis (2-ethylbutyl) silane
TCE	Trichloroethylene
TDS	Total dissolved solids
TF	Treatment facility
TNB	Trinitrobenzene
TNT	Trinitrotoluene
$^{235}U/^{238}U$	Atom ratio of the isotopes uranium-235 and uranium-238
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
VCF4I	Fourth vapor phase granular activated carbon filter influent
VE	Vapor effluent
VES	Vapor extraction system
VI	Vapor influent
VOC	Volatile organic compound
WGMG	Water Guidance and Monitoring Group
WS	Water supply well
Y	Yes

Hydrogeologic Units

Lower $Tnbs_1$ = 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 $Tnsc_1$ Neroly middle siltstone/claystone (1a = deepest).
$Tnbs_1$ = Lower member of the Neroly lower blue sandstone.
$Tnbs_0$ = Neroly silty sandstone.
$Tnbs_2$ = Miocene Neroly upper blue sandstone.
$Tnsc_0$ = Tertiary Neroly Formation—lower siltstone/claystone member.
$Tnsc_2$ = Miocene Neroly Formation—upper siltstone/claystone member.
Tps = Pliocene non-marine unit.
Tpsg = Miocene non-marine unit (gravel facies).
Tts = Tesla Formation.
Upper $Tnbs_1$ = Upper member of the Neroly lower blue sandstone, above claystone marker bed.

Table Summ-1. Mass removed, January 1, 2009 through June 30, 2009.

Treatment facility	Volume of ground water treated (thousands of gal)	Volume of soil vapor treated (thousands of ft^3)	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)
CGSA GWTS	484	NA	120	NA	NA	NA	NA
CGSA SVTS	NA	5,100	740	NA	NA	NA	NA
834 GWTS	65	NA	800	NA	17	NA	1.0
834 SVTS	NA	25,732	4,900	NA	NA	NA	NA
815-SRC GWTS	324	NA	6.7	8.6	120*	60	NA
815-PRX GWTS	318	NA	36	8.9	100*	NA	NA
815-DSB GWTS	641	NA	31	NA	NA	NA	NA
817-SRC GWTS	<1	NA	0	0.0053	0.13*	0	NA
817-PRX GWTS	243	NA	13	22	99*	5.5	NA
829-SRC GWTS	<1	NA	0	0	0	NA	NA
854-SRC GWTS	483	NA	120	5.4	89	NA	NA
854-SRC SVTS	NA	10,205	490	NA	NA	NA	NA
854-PRX GWTS	308	NA	37	14	54	NA	NA
854-DIS GWTS	4	NA	0.49	0.073	0.36	NA	NA
832-SRC GWTS	24	NA	3.9	0.66	9.8	NA	NA
832-SRC SVTS	NA	519	20	NA	NA	NA	NA
830-SRC GWTS	479	NA	480	1.6	62	NA	NA
830-SRC SVTS	NA	6,061	290	NA	NA	NA	NA
830-DISS GWTS	947	NA	97	12	240	NA	NA
Total	4,321	47,616	8,200	73	790	66	1.0

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.
ft^3 = Cubic feet.
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 $Tnbs_2$ HSU undergoes in-situ biotransformation to benign N_2 gas by anaerobic denitrifying bacteria.

Table Summ-2. Summary of cumulative remediation.

Treatment facility	Volume of ground water treated (thousands of gallons)	Volume of soil vapor treated (thousands of ft^3)	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)
EGSA GWTS	309,379	NA	7.6	NA	NA	NA	NA
CGSA GWTS	18,263	NA	25	NA	NA	NA	NA
CGSA SVTS	NA	114,537	72	NA	NA	NA	NA
834 GWTS	794	NA	41	NA	180	NA	9.5
834 SVTS	NA	234,424	310	NA	NA	NA	NA
815-SRC GWTS	4,222	NA	0.10	230	1,500*	1.2	NA
815-PRX GWTS	5,687	NA	0.64	140	1,700*	NA	NA
815-DSB GWTS	10,822	NA	0.37	NA	NA	NA	NA
817-SRC GWTS	29	NA	0	2.9	9.3*	0.0048	NA
817-PRX GWTS	1,953	NA	0.081	190	670*	0.050	NA
829-SRC GWTS	4	NA	0.00030	0.15	1.3	NA	NA
854-SRC GWTS	6,943	NA	5.0	130	1,300	NA	NA
854-SRC SVTS	NA	47,741	9.1	NA	NA	NA	NA
854-PRX GWTS	2,587	NA	0.59	110	440	NA	NA
854-DIS GWTS	25	NA	0.0031	0.35	1.7	NA	NA
832-SRC GWTS	598	NA	0.19	16	240	NA	NA
832-SRC SVTS	NA	20,192	2.0	NA	NA	NA	NA
830-SRC GWTS	3,682	NA	2.7	9.4	280	NA	NA
830-SRC SVTS	NA	31,323	49	NA	NA	NA	NA
830-PRXN GWTS	1,949	NA	0.26	NA	22	NA	NA
830-DISS GWTS	4,536	NA	1.3	39	1,100	NA	NA
Total	371,475	448,218	530	870	7,400	1.3	9.5

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.
ft^3 = Cubic feet.
g = Grams.
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 $Tnbs_2$ HSU undergoes in-situ biotransformation to benign N_2 gas by anaerobic denitrifying bacteria.**

Table 2.1-1. Central General Services Area (CGSA) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
CGSA	January	0	696	0	62,601
	February	336	336	514	36,843
	March	720	720	955	59,582
	April	624	624	967	131,659
	May	696	696	1,097	88,850
	June	792	792	1,566	104,823
Total		3,168	3,864	5,099	484,358

Table 2.1-2. Central General Services Area OU VOCs in ground water 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-GWTS-E	1/21/09	<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-GWTS-E	2/4/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/8/09	<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-GWTS-E	5/5/09	<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-GWTS-E	6/9/09	<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-GWTS-I	1/21/09	41	0.96	0.73	<0.5	<0.5	<0.5 E	<0.5	<0.5	<0.5 E	<0.5	<0.5	<0.5 E	<0.5	<0.5
CGSA-GWTS-I	4/8/09	<0.5 S	<0.5 S	<0.5 S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 S	<0.5	<0.5	<0.5 S	<0.5	<0.5
CGSA-GWTS-I	4/8/09 DUP	<0.5 S	<0.5 S	<0.5 S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 S	<0.5	<0.5	<0.5 S	<0.5	<0.5

Notes:

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

Table 2.1-2 (Cont.). Analyte detected but not reported in main table.

Location	Date	Detection frequency
CGSA-GWTS-E	1/21/09	0 of 18
CGSA-GWTS-E	2/4/09	0 of 18
CGSA-GWTS-E	3/3/09	0 of 18
CGSA-GWTS-E	4/8/09	0 of 18
CGSA-GWTS-E	5/5/09	0 of 18
CGSA-GWTS-E	6/9/09	0 of 18
CGSA-GWTS-I	1/21/09	0 of 18
CGSA-GWTS-I	4/8/09	0 of 18
CGSA-GWTS-I	4/8/09 DUP	0 of 18

Notes:

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

Table 2.1-3. Central General Services Area OU nitrate in ground water treatment system influent and effluent.

Location	Date	Nitrate as NO3 (mg/L)
CGSA-GWTS-E	1/21/09	47 D
CGSA-GWTS-E	2/4/09	47 D
CGSA-GWTS-E	3/3/09	49 D
CGSA-GWTS-E	4/8/09	43
CGSA-GWTS-E	5/5/09	44
CGSA-GWTS-E	6/9/09	47 D
CGSA-GWTS-I	1/21/09	47 D
CGSA-GWTS-I	4/8/09	50 D
CGSA-GWTS-I	4/8/09 DUP	52 D

Notes:

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

Table 2.1-4. Central General Services Area OU treatment facility sampling and analysis plan.

Sample Location	Sample Identification	Parameter	Frequency
CGSA GWTS			
Influent Port	CGSA-I	VOCs	Quarterly
		pH	Quarterly
		Nitrate	Quarterly
Effluent Port	CGSA-E	VOCs	Monthly
		pH	Monthly
		Nitrate	Monthly
Vapor Samples	CGSA-CFI	VOCs	Weekly[a]
	CGSA -CFE	VOCs	Weekly[a]
	CGSA -CF2I	VOCs	Weekly[a]
CGSA SVE System			
Influent Vapor	CGSA-VI	No Monitoring Requirements	
Effluent Vapor	CGSA-VE	VOCs	Weekly[a]
Intermediate GAC	CGSA-VCF4I	VOCs	Weekly[a]

Notes:

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

[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.

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

Table 2.1-5. Central General Services Area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-35A-01	PTMW	Qal	B	CMP	E200.7:Cd	2	Y	Next sample required 2ndQ 2011.
W-35A-01	PTMW	Qal	B	CMP	E239.2	2	Y	Next sample required 2ndQ 2011.
W-35A-01	PTMW	Qal	S	CMP	E601	2	Y	
W-35A-01	PTMW	Qal	S	CMP	E601	4		
W-35A-02	PTMW	Qal	B	CMP	E200.7:Zn	2	Y	Next sample required 2ndQ 2011.
W-35A-02	PTMW	Qal	S	CMP	E601	2	Y	
W-35A-02	PTMW	Qal	S	CMP	E601	4		
W-35A-03	PTMW	Qal	S	CMP	E601	2	Y	
W-35A-03	PTMW	Qal	S	CMP	E601	4		
W-35A-04*	PTMW	Qal	B	CMP	E200.7:Cu	2	Y	Next sample required 2ndQ 2011.
W-35A-04*	PTMW	Qal	S	CMP	E601	2	Y	
W-35A-04*	PTMW	Qal		WGMG	E502.2	4		
W-35A-04*	PTMW	Qal	S	CMP	E601	4		
W-35A-05	PTMW	$Tnbs_2$	B	CMP	E239.2	2	Y	Next sample required 2ndQ 2011.
W-35A-05	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-35A-05	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-35A-06	PTMW	Qal	S	CMP	E601	2	Y	
W-35A-06	PTMW	Qal	S	CMP	E601	4		
W-35A-07	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-35A-07	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-35A-08	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-35A-08	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-35A-08	GW	$Tnbs_2$	Q	CMP	E601	3		
W-35A-08	GW	$Tnbs_2$	Q	CMP	E601	4		
W-35A-09	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-35A-09	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-35A-10	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-35A-10	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-35A-11	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-35A-11	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-35A-12	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-35A-12	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-35A-13	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-35A-13	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-35A-14	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-35A-14	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-35A-14	GW	$Tnbs_2$	Q	CMP	E601	3		
W-35A-14	GW	$Tnbs_2$	Q	CMP	E601	4		
W-71	EW	$Tnbs_2$	B	CMP-TF	E245.2	4	N	CGSA extraction well. Insufficient water to collect sample.
W-7A	PTMW	$Tnbs_1$	B	CMP	E239.2	2	N	Inoperable pump.
W-7A	PTMW	$Tnbs_1$	S	CMP	E601	2	N	Inoperable pump.
W-7A	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7B	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7B	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7C	PTMW	$Tnbs_1$	S	CMP	E601	2	N	Inoperable pump.
W-7C	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7E*	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7E*	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7ES*	PTMW	Qal	S	CMP	E601	2	Y	

Table 2.1-5 (Cont.). Central General Services Area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-7ES*	PTMW	Qal	S	CMP	E601	4		
W-7F	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-7F	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-7G	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7G	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7H	PTMW	Qal	S	CMP	E601	2	Y	
W-7H	PTMW	Qal	S	CMP	E601	4		
W-7I	EW	$Tnbs_2$	S	CMP-TF	E601	2	N	CGSA extraction well. Insufficient water to collect sample.
W-7I	EW	$Tnbs_2$	S	CMP-TF	E601	4		CGSA extraction well.
W-7J	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-7J	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-7K	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7K	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7L	PTMW	$Tnbs_1$	B	CMP	E200.7:Cu	2	Y	Next sample required 2ndQ 2011.
W-7L	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7L	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7M	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7M	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7N	PTMW	$Tnbs_1$	B	CMP	E245.2	2	Y	Next sample required 2ndQ 2011.
W-7N	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-7N	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-7O	EW	Qal	B	CMP-TF	E200.7:Cu	2	Y	CGSA extraction well. Next sample required 2ndQ 2011.
W-7O	EW	Qal	B	CMP-TF	E200.7:Zn	2	Y	CGSA extraction well. Next sample required 2ndQ 2011.
W-7O	EW	Qal		DIS	E601	1	Y	CGSA extraction well.
W-7O	EW	Qal	S	CMP-TF	E601	2	Y	CGSA extraction well.
W-7O	EW	Qal	S	CMP-TF	E601	4		CGSA extraction well.
W-7P	EW	$Tnbs_1$	S	CMP-TF	E601	2	N	CGSA extraction well. Insufficient water to collect sample.
W-7P	EW	$Tnbs_1$	S	CMP-TF	E601	4		CGSA extraction well.
W-7PS*	PTMW	Qal	Q	CMP	E601	1	Y	
W-7PS*	PTMW	Qal	Q	CMP	E601	2	Y	
W-7PS*	PTMW	Qal	Q	CMP	E601	3		
W-7PS*	PTMW	Qal	Q	CMP	E601	4		
W-7Q	PTMW	$Tnbs_2$		DIS	E601	1	Y	
W-7Q	PTMW	$Tnbs_2$		DIS	E601	2	Y	
W-7Q	PTMW	$Tnbs_2$		DIS	E601	3		
W-7Q	PTMW	$Tnbs_2$		DIS	E601	4		
W-7R	EW	Qal		DIS	E601	1	Y	CGSA extraction well.
W-7R	EW	Qal	S	CMP-TF	E601	2	Y	CGSA extraction well.
W-7R	EW	Qal	S	CMP-TF	E601	4		CGSA extraction well.
W-7S	PTMW	Qal		DIS	E601	1	Y	
W-7S	PTMW	Qal		DIS	E601	2	Y	
W-7S	PTMW	Qal		DIS	E601	3		
W-7S	PTMW	Qal		DIS	E601	4		
W-7T	PTMW	Qal		DIS	E601	1	Y	
W-7T	PTMW	Qal		DIS	E601	2	Y	
W-7T	PTMW	Qal		DIS	E601	3		
W-7T	PTMW	Qal		DIS	E601	4		
W-843-01	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-843-01	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-843-02	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	

Table 2.1-5 (Cont.). Central General Services Area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-843-02	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-872-01	PTMW	$Tnbs_2$	B	CMP	E200.7:Cu	2	Y	Next sample required 2ndQ 2011.
W-872-01	PTMW	$Tnbs_2$	B	CMP	E239.2	2	Y	Next sample required 2ndQ 2011.
W-872-01	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-872-01	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-872-02	EW	$Tnbs_2$	S	CMP-TF	E601	2	N	CGSA extraction well. Insufficient water to collect sample.
W-872-02	EW	$Tnbs_2$	S	CMP-TF	E601	4		CGSA extraction well.
W-873-01	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-873-01	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-873-02	PTMW	$Tnbs_2$	S	CMP	E601	2	N	Inoperable pump.
W-873-02	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-873-03	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-873-03	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-873-04	PTMW	$Tnsc_1$	B	CMP	E239.2	2	Y	Next sample required 2ndQ 2011.
W-873-04	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-873-04	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-873-06	PTMW	$Tnbs_2$	B	CMP	E200.7:Cd	2	Y	Next sample required 2ndQ 2011.
W-873-06	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-873-06	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-873-07	EW	$Tnbs_2$	S	CMP-TF	E601	2	Y	CGSA extraction well.
W-873-07	EW	$Tnbs_2$	S	CMP-TF	E601	4		CGSA extraction well.
W-875-01	PTMW	$Tnbs_2$	B	CMP	E200.7:Cd	2	Y	Next sample required 2ndQ 2011.
W-875-01	PTMW	$Tnbs_2$	B	CMP	E200.7:Cu	2	Y	Next sample required 2ndQ 2011.
W-875-01	PTMW	$Tnbs_2$	B	CMP	E200.7:Zn	2	Y	Next sample required 2ndQ 2011.
W-875-01	PTMW	$Tnbs_2$	B	CMP	E239.2	2	Y	Next sample required 2ndQ 2011.
W-875-01	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-875-01	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-875-02	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-875-02	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-875-03	PTMW	$Tnbs_2$	S	CMP	E601	2	N	Dry.
W-875-03	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-875-04	PTMW	$Tnbs_2$	B	CMP	E239.2	2	Y	Next sample required 2ndQ 2011.
W-875-04	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-875-04	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-875-05	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-875-05	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-875-06	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-875-06	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-875-07	EW	$Tnbs_2$	B	CMP-TF	E239.2	2	Y	CGSA extraction well. Next sample required 2ndQ 2011.
W-875-07	EW	$Tnbs_2$	S	CMP-TF	E601	2	Y	CGSA extraction well.
W-875-07	EW	$Tnbs_2$	S	CMP-TF	E601	4		CGSA extraction well.
W-875-08	EW	$Tnbs_2$		DIS	E601	1	Y	CGSA extraction well.
W-875-08	EW	$Tnbs_2$	S	CMP-TF	E601	2	Y	CGSA extraction well.

Table 2.1-5 (Cont.). Central General Services Area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-875-08	EW	$Tnbs_2$	S	CMP-TF	E601	4		CGSA extraction well.
W-875-09	PTMW	$Tnbs_2$	S	CMP	E601	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-09	PTMW	$Tnbs_2$	S	CMP	E601	4		CGSA extraction well.
W-875-10	PTMW	$Tnbs_2$	B	CMP	E200.7:Ba	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-10	PTMW	$Tnbs_2$	B	CMP	E239.2	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-10	PTMW	$Tnbs_2$	S	CMP	E601	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-10	PTMW	$Tnbs_2$	S	CMP	E601	4		CGSA extraction well.
W-875-11	PTMW	$Tnbs_2$	B	CMP	E239.2	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-11	PTMW	$Tnbs_2$	B	CMP	E200.7:Ba	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-11	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	CGSA extraction well.
W-875-11	PTMW	$Tnbs_2$	S	CMP	E601	4		CGSA extraction well.
W-875-15	PTMW	$Tnbs_2$	S	CMP	E601	2	N	CGSA extraction well. Insufficient water to collect sample.
W-875-15	PTMW	$Tnbs_2$	S	CMP	E601	4		CGSA extraction well.
W-876-01	PTMW	$Tnbs_2$	S	CMP	E601	2	Y	
W-876-01	PTMW	$Tnbs_2$	S	CMP	E601	4		
W-879-01	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-879-01	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-889-01	PTMW	$Tnsc_1$	S	CMP	E601	2	Y	
W-889-01	PTMW	$Tnsc_1$	S	CMP	E601	4		
W-CGSA-1732	PTMW	Qal		DIS	E601	2	N	Dry.
W-CGSA-1733	PTMW	Qal		DIS	E601	1	Y	
W-CGSA-1733	PTMW	Qal		DIS	E601	2	Y	
W-CGSA-1733	PTMW	Qal		DIS	E601	3		
W-CGSA-1733	PTMW	Qal		DIS	E601	4		
W-CGSA-1735	PTMW	Qal		DIS	E601	2	N	Dry.
W-CGSA-1736	PTMW	Qal		DIS	E601	2	Y	
W-CGSA-1736	PTMW	Qal		DIS	E601	4		
W-CGSA-1737	PTMW	Qal		DIS	E601	2	Y	
W-CGSA-1737	PTMW	Qal		DIS	E601	4		
W-CGSA-1739	PTMW	Qal		DIS	E601	1	Y	
W-CGSA-1739	PTMW	Qal		DIS	E601	2	Y	
W-CGSA-1739	PTMW	Qal		DIS	E601	3		
W-CGSA-1739	PTMW	Qal		DIS	E601	4		

Notes:

***Well sampled as part of the surveillance monitoring performed by the Water Guidance and Monitoring Group (WGMG) for additional constiutents and the results are reported in the LLNL Site Annual Environmental Report.**

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

Table 2.1-6. Eastern General Services Area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
CDF-1*	WS	Qal-$Tnsc_0$		WGMG	E502.2	1	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	1	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	1	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	1	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	2	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	2	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	2	Y	
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	3		
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	3		
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	3		
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	4		
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	4		
CDF-1*	WS	Qal-$Tnsc_0$	M	CMP	E601	4		
CON-1*	WS	$Tnsc_0$		WGMG	E502.2	1	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	1	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	1	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	1	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	2	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	2	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	2	Y	
CON-1*	WS	$Tnsc_0$	M	CMP	E601	3		
CON-1*	WS	$Tnsc_0$	M	CMP	E601	3		
CON-1*	WS	$Tnsc_0$	M	CMP	E601	3		
CON-1*	WS	$Tnsc_0$	M	CMP	E601	4		
CON-1*	WS	$Tnsc_0$	M	CMP	E601	4		
CON-1*	WS	$Tnsc_0$	M	CMP	E601	4		
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	1	Y	
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	1	Y	
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	1	Y	
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	2	Y	
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	2	Y	
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	2	Y	
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	3		
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	3		
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	3		
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	4		
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	4		
CON-2	PTMW	Qal-$Tnsc_0$	M	CMP	E601	4		
W-24P-03	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25D-01	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25D-02	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25M-01	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25M-02	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25M-03	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25N-01	PTMW	Qal	S	PSDMP	E601	2	Y	
W-25N-01	PTMW	Qal	S	PSDMP	E601	4		
W-25N-04	PTMW	Tmss	A	PSDMP	E601	2	Y	
W-25N-05	PTMW	$Tnbs_1$	S	PSDMP	E601	2	N	Inoperable pump.
W-25N-05	PTMW	$Tnbs_1$	S	PSDMP	E601	4		
W-25N-06	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25N-07	GW	Qal	Q	PSDMP	E601	1	Y	
W-25N-07	GW	Qal	Q	PSDMP	E601	2	Y	
W-25N-07	GW	Qal	Q	PSDMP	E601	3		

Table 2.1-6 (Cont.). Eastern General Services Area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-25N-07	GW	Qal	Q	PSDMP	E601	4		
W-25N-08	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-25N-09	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-25N-10	GW	$Tnbs_1$	Q	PSDMP	E601	1	N	Inoperable pump.
W-25N-10	GW	$Tnbs_1$	Q	PSDMP	E601	2	N	Inoperable pump.
W-25N-10	GW	$Tnbs_1$	Q	PSDMP	E601	3		
W-25N-10	GW	$Tnbs_1$	Q	PSDMP	E601	4		
W-25N-11	GW	$Tnbs_1$	Q	PSDMP	E601	1	Y	
W-25N-11	GW	$Tnbs_1$	Q	PSDMP	E601	2	Y	
W-25N-11	GW	$Tnbs_1$	Q	PSDMP	E601	3		
W-25N-11	GW	$Tnbs_1$	Q	PSDMP	E601	4		
W-25N-12	GW	$Tnbs_1$	Q	PSDMP	E601	1	Y	
W-25N-12	GW	$Tnbs_1$	Q	PSDMP	E601	2	Y	
W-25N-12	GW	$Tnbs_1$	Q	PSDMP	E601	3		
W-25N-12	GW	$Tnbs_1$	Q	PSDMP	E601	4		
W-25N-13	GW	$Tnbs_1$	Q	PSDMP	E601	1	Y	
W-25N-13	GW	$Tnbs_1$	Q	PSDMP	E601	2	Y	
W-25N-13	GW	$Tnbs_1$	Q	PSDMP	E601	3		
W-25N-13	GW	$Tnbs_1$	Q	PSDMP	E601	4		
W-25N-15	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25N-18	PTMW	$Tnbs_1$	A	PSDMP	E601	2	N	Inoperable pump.
W-25N-20*	PTMW	Qal	A	PSDMP	E601	2	Y	
W-25N-21	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-25N-22	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-25N-23	PTMW	$Tnbs_1$	S	PSDMP	E601	2	Y	
W-25N-23	PTMW	$Tnbs_1$	S	PSDMP	E601	4		
W-25N-24	PTMW	Qal	S	PSDMP	E601	2	Y	
W-25N-24	PTMW	Qal	S	PSDMP	E601	4		
W-25N-25	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-25N-26	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-25N-28	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-26R-01*	PTMW	$Tnbs_1$	S	PSDMP	E601	2	Y	
W-26R-01*	PTMW	$Tnbs_1$	S	PSDMP	E601	4		
W-26R-02	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-26R-03	PTMW	Qal	S	PSDMP	E601	2	Y	
W-26R-03	PTMW	Qal	S	PSDMP	E601	4		
W-26R-04	PTMW	Qal	S	PSDMP	E601	2	Y	
W-26R-04	PTMW	Qal	S	PSDMP	E601	4		
W-26R-05*	PTMW	Qal	S	PSDMP	E601	2	Y	
W-26R-05*	PTMW	Qal	S	PSDMP	E601	4		
W-26R-06	PTMW	$Tnbs_1$	S	PSDMP	E601	2	Y	
W-26R-06	PTMW	$Tnbs_1$	S	PSDMP	E601	4		
W-26R-07	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-26R-08	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-26R-11*	PTMW	Qal	S	CMP	E601	2	Y	
W-26R-11*	PTMW	Qal	S	CMP	E601	4		
W-7D	PTMW	$Tnbs_1$	A	PSDMP	E601	2	Y	
W-7DS*	PTMW	Qal	A	PSDMP	E601	2	Y	

Notes:

EGSA primary COCs: VOCs (E601, E502.2, or E624).

***Well sampled as part of the surveillance monitoring performed by the Water Guidance and Monitoring Group (WGMG) for additional constiutents and the results are reported in the LLNL Site Annual Environmental Report.**

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

Table 2.1-7. Central General Services Area (CGSA) mass removed, January 1, 2009 through June 30, 2009.

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	18	NA	NA	NA	NA
	February	120	6.5	NA	NA	NA	NA
	March	270	28	NA	NA	NA	NA
	April	94	22	NA	NA	NA	NA
	May	100	21	NA	NA	NA	NA
	June	150	26	NA	NA	NA	NA
Total		740	120	NA	NA	NA	NA

Table 2.2-1. Building 834 (834) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
834	January	380	408	2,488	5,723
	February	664	672	4,298	9,628
	March	802	816	5,363	12,742
	April	580	624	3,890	9,739
	May	676	672	4,460	11,478
	June	812	816	5,232	15,224
Total		3,914	4,008	25,731	64,534

Table 2.2-2. Building 834 OU VOCs in ground water extraction 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-GWTS-E	1/13/09	<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-GWTS-E	2/2/09	<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-GWTS-E	3/2/09	<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-GWTS-E	4/6/09	<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-GWTS-E	5/6/09	<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-GWTS-E	6/8/09	<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-GWTS-I	1/13/09	1,300 D	13	490 D	<25 D	<0.5	<0.5 E	<0.5	<0.5	<0.5 E	<0.5	0.53	<0.5	<0.5	<0.5
834-GWTS-I	4/6/09	2,100 D	19	390 D	<25 D	<0.5	0.53	<0.5	<0.5	0.68	<0.5	0.91	<0.5	<0.5	<0.5
834-GWTS-I	4/6/09 DUP	2,100 D	18	420 D	<25 D	<0.5	0.53	<0.5	<0.5	0.71	<0.5	0.97	<0.5	<0.5	<0.5

Notes:

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

Table 2.2-2 (Cont.). Analyte detected but not reported in main table.

Location	Date	Detection frequency	1,2-DCE (total) (µg/L)
834-GWTS-E	1/13/09	0 of 18	–
834-GWTS-E	2/2/09	0 of 18	–
834-GWTS-E	3/2/09	0 of 18	–
834-GWTS-E	4/6/09	0 of 18	–
834-GWTS-E	5/6/09	0 of 18	–
834-GWTS-E	6/8/09	0 of 18	–
834-GWTS-I	1/13/09	1 of 18	490 D
834-GWTS-I	4/6/09	1 of 18	390 D
834-GWTS-I	4/6/09 DUP	1 of 18	420 D

Notes:

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

Table 2.2-3. Building 834 OU nitrate in ground water extraction treatment system influent and effluent.

Location	Date	Nitrate (as NO3) (mg/L)
834-GWTS-E	1/13/09	70
834-GWTS-E	2/2/09	67
834-GWTS-E	3/2/09	76
834-GWTS-E	4/6/09	71
834-GWTS-E	5/6/09	75
834-GWTS-E	6/8/09	67
834-GWTS-I	1/13/09	80
834-GWTS-I	4/6/09	71
834-GWTS-I	4/6/09 DUP	71

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

Table 2.2-4. Building 834 OU diesel range organic compounds in ground water extraction treatment system influent and effluent.

Location	Date	Diesel Range Organics (C12-C24) (μg/L)
834-GWTS-E	1/13/09	<200
834-GWTS-E	2/2/09	<200
834-GWTS-E	3/2/09	<200
834-GWTS-E	4/6/09	<200
834-GWTS-E	5/6/09	<200
834-GWTS-E	6/8/09	<200
834-GWTS-I	1/13/09	320
834-GWTS-I	2/2/09	<200
834-GWTS-I	3/2/09	<200
834-GWTS-I	4/6/09	<200
834-GWTS-I	4/6/09 DUP	<200

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

Table 2.2-5. Building 834 OU tetrabutyl orthosilicate (TBOS) in ground water extraction treatment system influent and effluent.

Location	Date	TBOS (μg/L)
834-GWTS-E	1/13/09	<10
834-GWTS-E	2/2/09	<10
834-GWTS-E	3/2/09	<10
834-GWTS-E	4/6/09	<10
834-GWTS-E	5/6/09	<10
834-GWTS-E	6/8/09	<10
834-GWTS-I	1/13/09	<10 E
834-GWTS-I	2/2/09	<10
834-GWTS-I	3/2/09	<10
834-GWTS-I	4/6/09	<10
834-GWTS-I	4/6/09 DUP	<10

Notes:

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

Table 2.2-6. Building 834 OU treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
834 GWTS			
Influent Port	**834-I**	**VOCs**	**Quarterly**
		TBOS	**Quarterly**
		Diesel	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**834-E**	**VOCs**	**Monthly**
		TBOS	**Monthly**
		Diesel	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**
834 SVTS			
Influent Port	**834-VI**	**No Monitoring Requirements**	
Effluent Port	**834-VE**	**VOCs**	**Weekly**[a]
Intermediate GAC	**834-VCF4I**	**VOCs**	**Weekly**[a]

Notes:

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

[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.**

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

Table 2.2-7. Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	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	E601	1	Y	
W-834-1709	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-1709	PTMW	Tpsg		DIS	E300.0:PERC	3		
W-834-1709	PTMW	Tpsg	S	CMP	E601	3		
W-834-1711	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-834-1711	PTMW	Tps	S	CMP	E601	1	Y	
W-834-1711	PTMW	Tps	A	CMP	TBOS	1	N	Insufficient water.
W-834-1711	PTMW	Tps		DIS	DWMETALS	3		
W-834-1711	PTMW	Tps	S	CMP	E601	3		
W-834-1824	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-1824	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-1824	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-1824	PTMW	Tpsg	S	CMP	E601	3		
W-834-1825	PTMW	Tpsg		DIS	E200.7:FE	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-1825	PTMW	Tpsg		DIS	E200.8:AS	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg		DIS	E200.8:CR	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg		DIS	E200.8:MN	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg		DIS	E200.8:SE	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-1825	PTMW	Tpsg		DIS	GENMIN	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg		DIS	LITEHCS	1	Y	
W-834-1825	PTMW	Tpsg		DIS	LOWVFAS	1	Y	
W-834-1825	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-1825	PTMW	Tpsg		DIS	E601	2	Y	
W-834-1825	PTMW	Tpsg	S	CMP	E601	3		
W-834-1825	PTMW	Tpsg		DIS	E601	4		
W-834-1833	PTMW	Tpsg		DIS	E200.7:FE	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg		DIS	E200.8:MN	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-1833	PTMW	Tpsg		DIS	E200.8:AS	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg		DIS	E200.8:CR	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg		DIS	E200.8:SE	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-1833	PTMW	Tpsg		DIS	LITEHCS	1	Y	
W-834-1833	PTMW	Tpsg		DIS	LOWVFAS	1	Y	
W-834-1833	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-1833	PTMW	Tpsg		DIS	E601	2	Y	
W-834-1833	PTMW	Tpsg	S	CMP	E601	3		
W-834-1833	PTMW	Tpsg		DIS	E601	4		
W-834-2001	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-2001	EW	Tpsg	S	CMP-TF	E624	1	Y	834 extraction well.
W-834-2001	EW	Tpsg	A	CMP-TF	EM8015:DIESEL	1	Y	834 extraction well.
W-834-2001	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-2001	EW	Tpsg		DIS	E624	2	Y	834 extraction well.
W-834-2001	EW	Tpsg	S	CMP-TF	E624	3		834 extraction well.
W-834-2001	EW	Tpsg		DIS	E624	4		834 extraction well.
W-834-2113	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2113	PTMW	Tpsg	S	CMP	E624	1	Y	
W-834-2113	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-2113	PTMW	Tpsg	S	CMP	E624	3		
W-834-2113	PTMW	Tpsg		DIS	TBOS	3		
W-834-2113	PTMW	Tpsg		DIS	E300.0:NO3	4		
W-834-2117	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2117	PTMW	Tpsg	S	CMP	E624	1	Y	
W-834-2117	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-2117	PTMW	Tpsg	S	CMP	E624	3		

Table 2.2-7 (Cont.). Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-834-2118	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2118	PTMW	Tpsg		DIS	E300.0:PERC	1	Y	
W-834-2118	PTMW	Tpsg	S	CMP	E624	1	Y	
W-834-2118	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-2118	PTMW	Tpsg		DIS	E300.0:PERC	3		
W-834-2118	PTMW	Tpsg	S	CMP	E624	3		
W-834-2119	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-2119	PTMW	Tpsg	S	CMP	E624	1	Y	
W-834-2119	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-2119	PTMW	Tpsg	S	CMP	E624	3		
W-834-A1	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-834-A1	PTMW	Tps	S	CMP	E624	1	Y	
W-834-A1	PTMW	Tps	A	CMP	EM8015:DIESEL	1	Y	
W-834-A1	PTMW	Tps	A	CMP	TBOS	1	Y	
W-834-A1	PTMW	Tps	S	CMP	E624	3		
W-834-A2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-A2	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-A2	PTMW	Tpsg	A	CMP	EM8015:DIESEL	1	N	Dry.
W-834-A2	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-A2	PTMW	Tpsg		DIS	E300.0:PERC	3		
W-834-A2	PTMW	Tpsg	S	CMP	E601	3		
W-834-B2	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-B2	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-B2	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-B2	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-B2	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-B2	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-B3	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-B3	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-B3	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-B3	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-B3	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-B3	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-B4	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-B4	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-B4	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-B4	PTMW	Tpsg	S	CMP	E601	3		
W-834-C2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-C2	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-C2	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-C2	PTMW	Tpsg	S	CMP	E601	3		
W-834-C4	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-C4	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-C4	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-C4	PTMW	Tpsg	S	CMP	E601	3		
W-834-C5	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-C5	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-C5	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-C5	PTMW	Tpsg	S	CMP	E601	3		
W-834-D10	PTMW	Tps	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D10	PTMW	Tps	S	CMP	E624	1	N	Dry.
W-834-D10	PTMW	Tps	A	CMP	EM8015:DIESEL	1	N	Dry.
W-834-D10	PTMW	Tps	A	CMP	TBOS	1	N	Dry.
W-834-D10	PTMW	Tps	S	CMP	E624	3		
W-834-D11	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D11	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-D11	PTMW	Tpsg	A	CMP	EM8015:DIESEL	1	N	Dry.
W-834-D11	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.

Table 2.2-7 (Cont.). Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-834-D11	PTMW	Tpsg	S	CMP	E601	3		
W-834-D12	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-D12	EW	Tpsg	S	CMP-TF	E624	1	Y	834 extraction well.
W-834-D12	EW	Tpsg	A	CMP-TF	EM8015:DIESEL	1	Y	834 extraction well.
W-834-D12	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-D12	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-D12	EW	Tpsg	S	CMP-TF	E624	3		834 extraction well.
W-834-D12	EW	Tpsg		DIS	TBOS	3		834 extraction well.
W-834-D12	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-D13	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-D13	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-D13	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-D13	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-D13	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-D13	EW	Tpsg		DIS	TBOS	3		834 extraction well.
W-834-D14	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-D14	PTMW	Tpsg	S	CMP	E601	1	N	Insufficient water.
W-834-D14	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-D14	PTMW	Tpsg	S	CMP	E601	3		
W-834-D15	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D15	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-D15	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-D15	PTMW	Tpsg	S	CMP	E601	3		
W-834-D16	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D16	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-D16	PTMW	Tpsg	A	CMP	EM8015:DIESEL	1	N	Dry.
W-834-D16	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-D16	PTMW	Tpsg	S	CMP	E601	3		
W-834-D17	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D17	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-D17	PTMW	Tpsg	A	CMP	EM8015:DIESEL	1	N	Dry.
W-834-D17	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-D17	PTMW	Tpsg	S	CMP	E601	3		
W-834-D18	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-D18	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-D18	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-D18	PTMW	Tpsg	S	CMP	E601	3		
W-834-D2	PTMW	Tnbs$_1$	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D2	PTMW	Tnbs$_1$	A	CMP	E601	1	N	Dry.
W-834-D2	PTMW	Tnbs$_1$	A	CMP	TBOS	1	N	Dry.
W-834-D3	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-D3	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-D3	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-D3	PTMW	Tpsg	S	CMP	E601	3		
W-834-D4	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-D4	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-D4	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-D4	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-D4	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-D4	EW	Tpsg		DIS	TBOS	3		834 extraction well.
W-834-D4	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-D5	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.*
W-834-D5	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.*
W-834-D5	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.*
W-834-D5	EW	Tpsg		DIS	E601	2	Y	834 extraction well.*
W-834-D5	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.*
W-834-D5	EW	Tpsg		DIS	TBOS	3		834 extraction well.*
W-834-D6	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.

Table 2.2-7 (Cont.). Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-834-D6	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-D6	EW	Tpsg		DIS	EM8015:DIESEL	1	Y	834 extraction well.
W-834-D6	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-D6	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-D6	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-D6	EW	Tpsg		DIS	TBOS	3		834 extraction well.
W-834-D6	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-D7	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-D7	EW	Tpsg	S	CMP-TF	E624	1	Y	834 extraction well.
W-834-D7	EW	Tpsg	A	CMP-TF	EM8015:DIESEL	1	Y	834 extraction well.
W-834-D7	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-D7	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-D7	EW	Tpsg	S	CMP-TF	E624	3		834 extraction well.
W-834-D7	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-D9A	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	N	Dry.
W-834-D9A	PTMW	$Tnbs_2$	A	CMP	E601	1	N	Dry.
W-834-D9A	PTMW	$Tnbs_2$	A	CMP	TBOS	1	N	Dry.
W-834-G3	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-G3	PTMW	Tpsg	A	CMP	E601	1	N	Dry.
W-834-G3	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-H2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-H2	PTMW	Tpsg	S	CMP	E601	1	N	Insufficient water.
W-834-H2	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-H2	PTMW	Tpsg	S	CMP	E601	3		
W-834-J1	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-J1	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-J1	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-J1	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-J1	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-J1	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-J2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-J2	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-J2	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-J2	PTMW	Tpsg	S	CMP	E601	3		
W-834-J3	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-J3	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-J3	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-J3	PTMW	Tpsg	S	CMP	E601	3		
W-834-K1A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-K1A	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-K1A	PTMW	Tpsg	A	CMP	EM8015:DIESEL	1	N	Dry.
W-834-K1A	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-K1A	PTMW	Tpsg	S	CMP	E601	3		
W-834-M1	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-M1	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-M1	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-M1	PTMW	Tpsg		DIS	E218.2	3		
W-834-M1	PTMW	Tpsg	S	CMP	E601	3		
W-834-M2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-M2	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-M2	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-M2	PTMW	Tpsg	S	CMP	E601	3		
W-834-S1	EW	Tpsg	A	CMP-TF	E300.0:NO3	1		834 extraction well.
W-834-S1	EW	Tpsg	S	CMP-TF	E624	1	Y	834 extraction well.
W-834-S1	EW	Tpsg	A	CMP-TF	EM8015:DIESEL	1	Y	834 extraction well.
W-834-S1	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-S1	EW	Tpsg		DIS	E624	2	Y	834 extraction well.
W-834-S1	EW	Tpsg		DIS	EM8015:DIESEL	2	Y	834 extraction well.

Table 2.2-7 (Cont.). Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-834-S1	EW	Tpsg	S	CMP-TF	E624	3		834 extraction well.
W-834-S1	EW	Tpsg	S	DIS	TBOS	3		834 extraction well.
W-834-S1	EW	Tpsg		DIS	E624	4		834 extraction well.
W-834-S10	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-S10	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-S10	PTMW	Tpsg	S	CMP	EM8015:DIESEL	1	N	Dry.
W-834-S10	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-S10	PTMW	Tpsg	S	CMP	E601	3		
W-834-S12A	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-S12A	EW	Tpsg	S	CMP-TF	E624	1	Y	834 extraction well.
W-834-S12A	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-S12A	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-S12A	EW	Tpsg	S	CMP-TF	E624	3		834 extraction well.
W-834-S12A	EW	Tpsg		DIS	E624	4		834 extraction well.
W-834-S13	EW	Tpsg	A	CMP-TF	E300.0:NO3	1	Y	834 extraction well.
W-834-S13	EW	Tpsg	S	CMP-TF	E601	1	Y	834 extraction well.
W-834-S13	EW	Tpsg	A	CMP-TF	TBOS	1	Y	834 extraction well.
W-834-S13	EW	Tpsg		DIS	E601	2	Y	834 extraction well.
W-834-S13	EW	Tpsg	S	CMP-TF	E601	3		834 extraction well.
W-834-S13	EW	Tpsg		DIS	E601	4		834 extraction well.
W-834-S4	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-S4	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-S4	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-S4	PTMW	Tpsg	S	CMP	E601	3		
W-834-S5	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-S5	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-S5	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-S5	PTMW	Tpsg	S	CMP	E601	3		
W-834-S6	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Insufficient water.
W-834-S6	PTMW	Tpsg	S	CMP	E601	1	N	Insufficient water.
W-834-S6	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-S6	PTMW	Tpsg	S	CMP	E601	3		
W-834-S7	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-S7	PTMW	Tpsg		DIS	E300.0:PERC	1	Y	
W-834-S7	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-S7	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-S7	PTMW	Tpsg		DIS	E300.0:PERC	3		
W-834-S7	PTMW	Tpsg	S	CMP	E601	3		
W-834-S8	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-834-S8	PTMW	$Tnsc_2$	S	CMP	E624	1	Y	
W-834-S8	PTMW	$Tnsc_2$	A	CMP	EM8015:DIESEL	1	Y	
W-834-S8	PTMW	$Tnsc_2$	A	CMP	TBOS	1	Y	
W-834-S8	PTMW	$Tnsc_2$	S	CMP	E624	3		
W-834-S9	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-834-S9	PTMW	$Tnsc_2$	S	CMP	E624	1	Y	
W-834-S9	PTMW	$Tnsc_2$	A	CMP	EM8015:DIESEL	1	Y	
W-834-S9	PTMW	$Tnsc_2$	A	CMP	TBOS	1	Y	
W-834-S9	PTMW	$Tnsc_2$	S	CMP	E624	3		
W-834-T1	GW	$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
W-834-T1	GW	$Tnbs_1$	Q	CMP	E601	1	Y	
W-834-T1	GW	$Tnbs_1$	S	CMP	TBOS	1	Y	
W-834-T1	GW	$Tnbs_1$	Q	CMP	E601	2	Y	
W-834-T1	GW	$Tnbs_1$	S	CMP	E300.0:NO3	3		
W-834-T1	GW	$Tnbs_1$	Q	CMP	E601	3		
W-834-T1	GW	$Tnbs_1$	S	CMP	TBOS	3		
W-834-T1	GW	$Tnbs_1$	Q	CMP	E601	4		

Table 2.2-7 (Cont.). Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-834-T11	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-T11	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-T11	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-T11	PTMW	Tpsg	S	CMP	E601	3		
W-834-T2	PTMW	Tpsg		DIS	E200.7:FE	1	N	Insufficient water.
W-834-T2	PTMW	Tpsg		DIS	E200.8:AS	1	N	Insufficient water.
W-834-T2	PTMW	Tpsg		DIS	E200.8:CR	1	N	Insufficient water.
W-834-T2	PTMW	Tpsg		DIS	E200.8:MN	1	N	Insufficient water.
W-834-T2	PTMW	Tpsg		DIS	E200.8:SE	1	N	Insufficient water.
W-834-T2	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T2	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-T2	PTMW	Tpsg		DIS	LITEHCS	1	Y	
W-834-T2	PTMW	Tpsg		DIS	LOWVFAS	1	Y	
W-834-T2	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-T2	PTMW	Tpsg		DIS	E601	2	Y	
W-834-T2	PTMW	Tpsg	S	CMP	E601	3		
W-834-T2	PTMW	Tpsg		DIS	E601	4		
W-834-T2A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T2A	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-T2A	PTMW	Tpsg		DIS	LITEHCS	1	Y	
W-834-T2A	PTMW	Tpsg		DIS	LOWVFAS	1	Y	
W-834-T2A	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-T2A	PTMW	Tpsg	S	CMP	E601	3		
W-834-T2B	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-T2B	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-T2B	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-T2B	PTMW	Tpsg	S	CMP	E601	3		
W-834-T2C	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-T2C	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-T2C	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-T2C	PTMW	Tpsg	S	CMP	E601	3		
W-834-T2D	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T2D	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-T2D	PTMW	Tpsg	A	CMP	TBOS	1	N	Insufficient water.
W-834-T2D	PTMW	Tpsg	S	CMP	E601	3		
W-834-T3	GW	$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
W-834-T3	GW	$Tnbs_1$	Q	CMP	E601	1	Y	
W-834-T3	GW	$Tnbs_1$	S	CMP	TBOS	1	Y	
W-834-T3	GW	$Tnbs_1$	Q	CMP	E601	2	Y	
W-834-T3	GW	$Tnbs_1$	S	CMP	E300.0:NO3	3		
W-834-T3	GW	$Tnbs_1$	Q	CMP	E601	3		
W-834-T3	GW	$Tnbs_1$	S	CMP	TBOS	3		
W-834-T3	GW	$Tnbs_1$	Q	CMP	E601	4		
W-834-T5	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-834-T5	PTMW	Tpsg	S	CMP	E601	1	Y	
W-834-T5	PTMW	Tpsg	A	CMP	TBOS	1	Y	
W-834-T5	PTMW	Tpsg	S	CMP	E601	3		
W-834-T7A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-T7A	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-T7A	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-T7A	PTMW	Tpsg	S	CMP	E601	3		
W-834-T8A	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-T8A	PTMW	Tpsg	S	CMP	E601	1	N	Dry.
W-834-T8A	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-T8A	PTMW	Tpsg	S	CMP	E601	3		
W-834-T9	PTMW	Tpsg	A	CMP	E300.0:NO3	1	N	Dry.
W-834-T9	PTMW	Tpsg	S	CMP	E601	1	N	Dry.

Table 2.2-7 (Cont.). Building 834 OU ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-834-T9	PTMW	Tpsg	A	CMP	TBOS	1	N	Dry.
W-834-T9	PTMW	Tpsg	S	CMP	E601	3		
W-834-U1	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-834-U1	PTMW	Tps	S	CMP	E624	1	Y	
W-834-U1	PTMW	Tps	A	CMP	EM8015:DIESEL	1	Y	
W-834-U1	PTMW	Tps	A	CMP	TBOS	1	Y	
W-834-U1	PTMW	Tps	S	CMP	E624	3		

Notes:
Building 834 primary COC: VOCs (E601, 502.2, or E624).
Building 834 secondary COC: Nitrate (E300.0:NO3).
Building 834 secondary COC: TBOS/TKEBS.
Building 834 secondary COC: Diesel.
***Well W-834-D5 is hooked up to the Building 834 treatment system but is not currently being used as an extraction well.**
See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.2-8. Building 834 (834) mass removed, January 1, 2009 through June 30, 2009.

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	830	67	NA	1.5	NA	0.074
	February	1,600	120	NA	2.4	NA	0.14
	March	790	150	NA	3.2	NA	0.23
	April	550	130	NA	2.4	NA	0.17
	May	550	150	NA	3.0	NA	0.18
	June	650	180	NA	4.4	NA	0.22
Total		4,900	800	NA	17	NA	1.0

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

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
BC6-10	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
BC6-10	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
BC6-10	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
BC6-10	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
BC6-10	PTMW	$Tnbs_1$	S	CMP	E601	3		
BC6-10	PTMW	$Tnbs_1$	S	CMP	E906	3		
BC6-13 (SPRING 7)	PTMW	$Qt/Tnbs_1$	A	CMP	E300.0:NO3	1	N	Dry.
BC6-13 (SPRING 7)	PTMW	$Qt/Tnbs_1$	A	CMP	E300.0:PERC	1	N	Dry.
BC6-13 (SPRING 7)	PTMW	$Qt/Tnbs_1$	A	CMP	E601	1	N	Dry.
BC6-13 (SPRING 7)	PTMW	$Qt/Tnbs_1$	A	CMP	E906	1	N	Dry.
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$		WGMG	E624	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	1	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$		WGMG	E624	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	2	Y	
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:NO3	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E300.0:PERC	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E601	3		
CARNRW1*	WS	$Tnbs_1/Tmss$		WGMG	E624	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	3		
CARNRW1*	WS	$Tnbs_1/Tmss$	M	CMP	E906	3		

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW1*	WS	$Tnbs_1$/Tmss		WGMG	E624	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW1*	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss		WGMG	E502.2	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	1	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	2	Y	
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	3		
CARNRW2*	WS	$Tnbs_1$/Tmss		WGMG	E502.2	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW2*	WS	$Tnbs_1$/Tmss		WGMG	E502.2	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW2*	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	1	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	2	Y	
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	3		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:NO3	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E300.0:PERC	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E601	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW3	WS	$Tnbs_1$/Tmss	M	CMP	E906	4		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E601	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E601	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E601	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E906	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E906	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E906	1	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E601	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E601	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E601	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E906	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E906	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E906	2	Y	
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	3		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	3		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	3		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	3		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	3		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	3		
CARNRW4	WS	Qal/Tts	M	CMP	E601	3		
CARNRW4	WS	Qal/Tts	M	CMP	E601	3		
CARNRW4	WS	Qal/Tts	M	CMP	E601	3		
CARNRW4	WS	Qal/Tts	M	CMP	E906	3		
CARNRW4	WS	Qal/Tts	M	CMP	E906	3		
CARNRW4	WS	Qal/Tts	M	CMP	E906	3		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	4		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	4		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:NO3	4		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	4		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	4		
CARNRW4	WS	Qal/Tts	M	CMP	E300.0:PERC	4		
CARNRW4	WS	Qal/Tts	M	CMP	E601	4		
CARNRW4	WS	Qal/Tts	M	CMP	E601	4		
CARNRW4	WS	Qal/Tts	M	CMP	E601	4		
CARNRW4	WS	Qal/Tts	M	CMP	E906	4		
CARNRW4	WS	Qal/Tts	M	CMP	E906	4		
CARNRW4	WS	Qal/Tts	M	CMP	E906	4		
EP6-06	DMW	Qt/$Tnbs_1$		WGMG	E300.0:NO3	1	Y	

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	1	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E8260	1	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E906	1	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	2	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	2	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E8260	2	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E906	2	Y	
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	3		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	3		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E8260	3		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E906	3		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	4		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	4		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E8260	4		
EP6-06	DMW	$Qt/Tnbs_1$		WGMG	E906	4		
EP6-07	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
EP6-07	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
EP6-07	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
EP6-07	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
EP6-07	PTMW	$Tnbs_1$	S	CMP	E601	3		
EP6-07	PTMW	$Tnbs_1$	S	CMP	E906	3		
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E8260	1	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E906	1	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E8260	2	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E906	2	N	Dry.
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
EP6-08	DMW	$Tnbs_1$		WGMG	E8260	3		
EP6-08	DMW	$Tnbs_1$		WGMG	E906	3		
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
EP6-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
EP6-08	DMW	$Tnbs_1$		WGMG	E8260	4		
EP6-08	DMW	$Tnbs_1$		WGMG	E906	4		
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E8260	1	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E906	1	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E8260	2	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E906	2	Y	
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
EP6-09	DMW	$Tnbs_1$		WGMG	E8260	3		
EP6-09	DMW	$Tnbs_1$		WGMG	E906	3		
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
EP6-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
EP6-09	DMW	$Tnbs_1$		WGMG	E8260	4		
EP6-09	DMW	$Tnbs_1$		WGMG	E906	4		
K6-01**	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K6-01**	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K6-01**	DMW	$Tnbs_1$		WGMG	E601	1	Y	
K6-01**	DMW	$Tnbs_1$		WGMG	E906	1	Y	
K6-01**	DMW	$Tnbs_1$		WGMG	E601	3		
K6-01**	DMW	$Tnbs_1$		WGMG	E906	3		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E8260	1	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E906	1	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E8260	2	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E906	2	Y	
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	3		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	3		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E8260	3		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E906	3		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:NO3	4		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E300.0:PERC	4		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E8260	4		
K6-01S	DMW	$Qt/Tnbs_1$		WGMG	E906	4		
K6-03	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-03	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-03	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
K6-03	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
K6-03	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-03	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-04	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	N	Insufficient water.
K6-04	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	N	Insufficient water.
K6-04	PTMW	$Tnbs_1$	S	CMP	E601	1	N	Insufficient water.
K6-04	PTMW	$Tnbs_1$	S	CMP	E906	1	N	Insufficient water.
K6-04	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-04	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-14	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-14	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-14	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
K6-14	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
K6-14	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-14	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-15	PTMW	$Qt/Tnbs_1$	A	CMP	E300.0:NO3	1	N	Dry.
K6-15	PTMW	$Qt/Tnbs_1$	A	CMP	E300.0:PERC	1	N	Dry.
K6-15	PTMW	$Qt/Tnbs_1$	S	CMP	E601	1	N	Dry.
K6-15	PTMW	$Qt/Tnbs_1$	S	CMP	E906	1	N	Dry.
K6-15	PTMW	$Qt/Tnbs_1$	S	CMP	E601	3		
K6-15	PTMW	$Qt/Tnbs_1$	S	CMP	E906	3		
K6-16	PTMW	$Qt/Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-16	PTMW	$Qt/Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-16	PTMW	$Qt/Tnbs_1$	S	CMP	E601	1	Y	

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K6-16	PTMW	Qt/$Tnbs_1$	S	CMP	E906	1	Y	
K6-16	PTMW	Qt/$Tnbs_1$	S	CMP	E601	3		
K6-16	PTMW	Qt/$Tnbs_1$	S	CMP	E906	3		
K6-17	GW	Qt/$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
K6-17	GW	Qt/$Tnbs_1$	S	CMP	E300.0:PERC	1	Y	
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E601	1	Y	
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E906	1	Y	
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E601	2	Y	
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E906	2	Y	
K6-17	GW	Qt/$Tnbs_1$	S	CMP	E300.0:NO3	3		
K6-17	GW	Qt/$Tnbs_1$	S	CMP	E300.0:PERC	3		
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E601	3		
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E906	3		
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E601	4		
K6-17	GW	Qt/$Tnbs_1$	Q	CMP	E906	4		
K6-18	PTMW	Qt/$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-18	PTMW	Qt/$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-18	PTMW	Qt/$Tnbs_1$	S	CMP	E601	1	Y	
K6-18	PTMW	Qt/$Tnbs_1$	S	CMP	E906	1	Y	
K6-18	PTMW	Qt/$Tnbs_1$		DIS	E300.0:NO3	2	Y	
K6-18	PTMW	Qt/$Tnbs_1$	S	CMP	E601	3		
K6-18	PTMW	Qt/$Tnbs_1$	S	CMP	E906	3		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E8260	1	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E906	1	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E8260	2	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E906	2	Y	
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:NO3	3		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:PERC	3		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E8260	3		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E906	3		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:NO3	4		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E300.0:PERC	4		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E8260	4		
K6-19	DMW	Qt/$Tnbs_1$		WGMG	E906	4		
K6-21	PTMW	Qt	A	CMP	E300.0:NO3	1	N	Dry.
K6-21	PTMW	Qt	A	CMP	E300.0:PERC	1	N	Dry.
K6-21	PTMW	Qt	A	CMP	E601	1	N	Dry.
K6-21	PTMW	Qt	A	CMP	E906	1	N	Dry.
K6-22	GW	$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
K6-22	GW	$Tnbs_1$	S	CMP	E300.0:PERC	1	Y	
K6-22	GW	$Tnbs_1$	Q	CMP	E601	1	Y	
K6-22	GW	$Tnbs_1$	Q	CMP	E906	1	Y	
K6-22	GW	$Tnbs_1$	Q	CMP	E601	2	Y	
K6-22	GW	$Tnbs_1$	Q	CMP	E906	2	Y	
K6-22	GW	$Tnbs_1$	S	CMP	E300.0:NO3	3		
K6-22	GW	$Tnbs_1$	S	CMP	E300.0:PERC	3		
K6-22	GW	$Tnbs_1$	Q	CMP	E601	3		

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K6-22	GW	$Tnbs_1$	Q	CMP	E906	3		
K6-22	GW	$Tnbs_1$	Q	CMP	E601	4		
K6-22	GW	$Tnbs_1$	Q	CMP	E906	4		
K6-23	PTMW	Tmss	A	CMP	E300.0:NO3	1	Y	
K6-23	PTMW	Tmss	A	CMP	E300.0:PERC	1	Y	
K6-23	PTMW	Tmss	S	CMP	E601	1	Y	
K6-23	PTMW	Tmss	S	CMP	E906	1	Y	
K6-23	PTMW	Tmss	S	CMP	E601	3		
K6-23	PTMW	Tmss	S	CMP	E906	3		
K6-24	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	N	Dry.
K6-24	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	N	Dry.
K6-24	PTMW	$Tnbs_1$	S	CMP	E601	1	N	Dry.
K6-24	PTMW	$Tnbs_1$	S	CMP	E906	1	N	Dry.
K6-24	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-24	PTMW	$Tnbs_1$	S	CMP	E906	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	E601	1	Y	
K6-25	PTMW	Tmss	S	CMP	E906	1	Y	
K6-25	PTMW	Tmss	S	CMP	E601	3		
K6-25	PTMW	Tmss	S	CMP	E906	3		
K6-26	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-26	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-26	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
K6-26	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
K6-26	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-26	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-27	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-27	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-27	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
K6-27	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
K6-27	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-27	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-32	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	N	Dry.
K6-32	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	N	Dry.
K6-32	PTMW	$Tnbs_1$	S	CMP	E601	1	N	Dry.
K6-32	PTMW	$Tnbs_1$	S	CMP	E906	1	N	Dry.
K6-32	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-32	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-33	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	N	Dry.
K6-33	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	N	Dry.
K6-33	PTMW	$Tnbs_1$	S	CMP	E601	1	N	Dry.
K6-33	PTMW	$Tnbs_1$	S	CMP	E906	1	N	Dry.
K6-33	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-33	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-34	GW	$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
K6-34	GW	$Tnbs_1$	S	CMP	E300.0:PERC	1	Y	
K6-34	GW	$Tnbs_1$	Q	CMP	E601	1	Y	
K6-34	GW	$Tnbs_1$	Q	CMP	E906	1	Y	
K6-34	GW	$Tnbs_1$	Q	CMP	E601	2	Y	
K6-34	GW	$Tnbs_1$	Q	CMP	E906	2	Y	

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K6-34	GW	$Tnbs_1$	S	CMP	E300.0:NO3	3		
K6-34	GW	$Tnbs_1$	S	CMP	E300.0:PERC	3		
K6-34	GW	$Tnbs_1$	Q	CMP	E601	3		
K6-34	GW	$Tnbs_1$	Q	CMP	E906	3		
K6-34	GW	$Tnbs_1$	Q	CMP	E601	4		
K6-34	GW	$Tnbs_1$	Q	CMP	E906	4		
K6-35	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
K6-35	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
K6-35	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
K6-35	PTMW	$Tnbs_1$	S	CMP	E906	1	Y	
K6-35	PTMW	$Tnbs_1$	S	CMP	E601	3		
K6-35	PTMW	$Tnbs_1$	S	CMP	E906	3		
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E8260	1	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E906	1	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E8260	2	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E906	2	N	Dry.
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K6-36	DMW	$Tnbs_1$		WGMG	E8260	3		
K6-36	DMW	$Tnbs_1$		WGMG	E906	3		
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
K6-36	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K6-36	DMW	$Tnbs_1$		WGMG	E8260	4		
K6-36	DMW	$Tnbs_1$		WGMG	E906	4		
SPRING15	SPR	Qt	A	CMP	E300.0:NO3	1	N	Dry.
SPRING15	SPR	Qt	A	CMP	E300.0:PERC	1	N	Dry.
SPRING15	SPR	Qt	A	CMP	E601	1	N	Dry.
SPRING15	SPR	Qt	A	CMP	E906	1	N	Dry.
SPRING8	SPR	Qt		DIS	DWMETALS	4		
SPRING8	SPR	Qt		DIS	E210.2	4		
SPRING8	SPR	Qt		DIS	E300.0:PERC	4		
SPRING8	SPR	Qt		DIS	E601	4		
SPRING8	SPR	Qt		DIS	E8330	4		
SPRING8	SPR	Qt		DIS	E906	4		
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	E601	1	Y	
W-33C-01	PTMW	Tts	S	CMP	E906	1	Y	
W-33C-01	PTMW	Tts	S	CMP	E601	3		
W-33C-01	PTMW	Tts	S	CMP	E906	3		
W-34-01	MWB	$Tnsc_1$		DIS	E300.0:NO3	1	Y	
W-34-01	MWB	$Tnsc_1$		DIS	E300.0:PERC	1	Y	
W-34-01	MWB	$Tnsc_1$		DIS	E601	1	Y	
W-34-01	MWB	$Tnsc_1$		DIS	E906	1	Y	
W-34-02	MWB	Upper $Tnbs_1$		DIS	E300.0:NO3	1	Y	
W-34-02	MWB	Upper $Tnbs_1$		DIS	E300.0:PERC	1	Y	
W-34-02	MWB	Upper $Tnbs_1$		DIS	E601	1	Y	
W-34-02	MWB	Upper $Tnbs_1$		DIS	E906	1	Y	
W-PIT6-1819	GW	$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
W-PIT6-1819	GW	$Tnbs_1$	S	CMP	E300.0:PERC	1	Y	

Table 2.3-1 (Cont.). Pit 6 Landfill OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample Driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E601	1	Y	
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E906	1	Y	
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E601	2	Y	
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E906	2	Y	
W-PIT6-1819	GW	$Tnbs_1$	S	CMP	E300.0:NO3	3		
W-PIT6-1819	GW	$Tnbs_1$	S	CMP	E300.0:PERC	3		
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E601	3		
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E906	3		
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E601	4		
W-PIT6-1819	GW	$Tnbs_1$	Q	CMP	E906	4		

Notes:

DWM Analytes and sampling frequency are specified in the Pit 6 Landfill Post-Closure Plan.

***Well sampled as part of the surveillance monitoring performed by the Water Guidance and Monitoring Group (WGMG) for additional constiutents and the results are reported in the LLNL Site Annual Environmental Report.**

****K6-01 to be sampled quarterly if K6-01S is dry.**

Pit 6 primary COC: VOCs (E601, E502.2, or E624).

Pit 6 primary COC: tritium (E906).

Pit 6 secondary COC: nitrate (E300:NO3).

Pit 6 secondary COC: perchlorate (E300.0:PERC).

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

Table 2.4-1. Building 815-Source (815-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
815-SRC	January	NA	670	NA	53,950
	February	NA	647	NA	50,819
	March	NA	836	NA	63,550
	April	NA	584	NA	44,091
	May	NA	689	NA	51,568
	June	NA	814	NA	59,865
Total		NA	4,240	NA	323,843

Table 2.4-2. Building 815-Proximal (815-PRX) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
815-PRX	January	NA	0	NA	0
	February	NA	315	NA	36,946
	March	NA	848	NA	98,713
	April	NA	592	NA	86,103
	May	NA	460	NA	39,498
	June	NA	783	NA	56,931
Total		NA	2,998	NA	318,191

Table 2.4-3. Building 815-Distal Site Boundary (815-DSB) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
815-DSB	January	NA	698	NA	87,697
	February	NA	218	NA	30,687
	March	NA	491	NA	70,512
	April	NA	719	NA	162,512
	May	NA	678	NA	152,423
	June	NA	809	NA	137,164
Total		NA	3,613	NA	640,995

Table 2.4-4. Building 817-Source (817-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
817-SRC	January	NA	0	NA	0
	February	NA	2	NA	36
	March	NA	3	NA	58
	April	NA	2	NA	73
	May	NA	3	NA	128
	June	NA	3	NA	159
Total		NA	13	NA	454

Table 2.4-5. Building 817-Proximal (817-PRX) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
817-PRX	January	NA	0	NA	0
	February	NA	0	NA	0
	March	NA	464	NA	59,726
	April	NA	568	NA	38,294
	May	NA	674	NA	66,417
	June	NA	841	NA	78,914
Total		NA	2,547	NA	243,351

Table 2.4-6. Building 829-Source (829-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
829-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	0
	June	NA	0	NA	0
Total		NA	0	NA	0

Table 2.4-7. High Explosive Process Area OU VOCs in ground water 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 Boundry															
815-DSB-GWTS-E	1/12/09	<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-GWTS-E	2/4/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/7/09	<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-GWTS-E	5/5/09	<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-GWTS-E	6/9/09	<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-GWTS-I	1/12/09	11	<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-GWTS-I	4/7/09	13	<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-GWTS-I	4/7/09 DUP	13	<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-GWTS-E	2/11/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/6/09	<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-GWTS-E	5/5/09	<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-GWTS-E	6/8/09	<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-GWTS-I	2/11/09	25	<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-GWTS-I	4/6/09	31	<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-GWTS-I	4/6/09 DUP	34	<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															
815-SRC-GWTS-E	1/7/09	<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-GWTS-E	2/3/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/6/09	<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-GWTS-E	5/5/09	<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 (Cont.). High Explosive Process Area OU VOCs in ground water 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-Source (Continued)															
815-SRC-GWTS-E	6/8/09	<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-GWTS-I	1/7/09	4.6	<0.5	<0.5	<0.5	<0.5	<0.5 E	<0.5 E	<0.5	0.52	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-GWTS-I	4/6/09	4.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
815-SRC-GWTS-I	4/6/09 DUP	4.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Building 817-Proximal[b]															
817-PRX-GWTS-E	3/11/09	<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-GWTS-E	4/6/09	<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-GWTS-E	5/5/09	<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-GWTS-E	6/8/09	<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-GWTS-I	3/11/09	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
817-PRX-GWTS-I	4/6/09	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
817-PRX-GWTS-I	4/6/09 DUP	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
Building 817-Source[a]															
817-SRC-GWTS-E	2/25/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/8/09	<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-GWTS-E	5/5/09	<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-GWTS-E	6/8/09	<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-GWTS-I	2/25/09	<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-GWTS-I	4/8/09	<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-GWTS-I	4/8/09 DUP	<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[c]															

Notes appear on the following page.

Table 2.4-7 (Cont.). High Explosive Process Area OU VOCs in ground water treatment system influent and effluent.

Notes:

[a] **No samples collected in January due to freeze protection shutdown.**

[b] **No samples collected in January and February due to system electronics problems.**

[c] **No samples were collected during this semester due to compressor power problems.**

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

Table 2.4-7 (Cont.). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 815-Distal Site Boundry		
815-DSB-GWTS-E	1/12/09	0 of 18
815-DSB-GWTS-E	2/4/09	0 of 18
815-DSB-GWTS-E	3/3/09	0 of 18
815-DSB-GWTS-E	4/7/09	0 of 18
815-DSB-GWTS-E	5/5/09	0 of 18
815-DSB-GWTS-E	6/9/09	0 of 18
815-DSB-GWTS-I	1/12/09	0 of 18
815-DSB-GWTS-I	4/7/09	0 of 18
815-DSB-GWTS-I	4/7/09 DUP	0 of 18
Building 815-Proximal[a]		
815-PRX-GWTS-E	2/11/09	0 of 18
815-PRX-GWTS-E	3/3/09	0 of 18
815-PRX-GWTS-E	4/6/09	0 of 18
815-PRX-GWTS-E	5/5/09	0 of 18
815-PRX-GWTS-E	6/8/09	0 of 18
815-PRX-GWTS-I	2/11/09	0 of 18
815-PRX-GWTS-I	4/6/09	0 of 18
815-PRX-GWTS-I	4/6/09 DUP	0 of 18
Building 815-Source		
815-SRC-GWTS-E	1/7/09	0 of 18
815-SRC-GWTS-E	2/3/09	0 of 18
815-SRC-GWTS-E	3/3/09	0 of 18
815-SRC-GWTS-E	4/6/09	0 of 18
815-SRC-GWTS-E	5/5/09	0 of 18
815-SRC-GWTS-E	6/8/09	0 of 18
815-SRC-GWTS-I	1/7/09	0 of 18
815-SRC-GWTS-I	4/6/09	0 of 18
815-SRC-GWTS-I	4/6/09 DUP	0 of 18
Building 817-Proximal[b]		
817-PRX-GWTS-E	3/11/09	0 of 18
817-PRX-GWTS-E	4/6/09	0 of 18
817-PRX-GWTS-E	5/5/09	0 of 18
817-PRX-GWTS-E	6/8/09	0 of 18
817-PRX-GWTS-I	3/11/09	0 of 18
817-PRX-GWTS-I	4/6/09	0 of 18
817-PRX-GWTS-I	4/6/09 DUP	0 of 18
Building 817-Source[a]		
817-SRC-GWTS-E	2/25/09	0 of 18
817-SRC-GWTS-E	3/3/09	0 of 18
817-SRC-GWTS-E	4/8/09	0 of 18
817-SRC-GWTS-E	5/5/09	0 of 18
817-SRC-GWTS-E	6/8/09	0 of 18
817-SRC-GWTS-I	2/25/09	0 of 18
817-SRC-GWTS-I	4/8/09	0 of 18
817-SRC-GWTS-I	4/8/09 DUP	0 of 18

Table 2.4-7 (Cont.). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 829-Source[c]		

Notes:

[a] **No samples collected in January due to freeze protection shutdown.**

[b] **No samples collected in January and February due to system electronics problems.**

[c] **No samples were collected during this semester due to compressor power problems.**

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

Table 2.4-8. High Explosive Process Area OU nitrate and perchlorate in ground water treatment system influent and effluent.

Location	Date	Nitrate (as NO3) (mg/L)	Perchlorate (µg/L)
Building 815-Distal Site Boundry			
815-DSB-GWTS-E	1/12/09	1	NR
815-DSB-GWTS-E	2/4/09	<0.5	NR
815-DSB-GWTS-E	3/3/09	<0.5	NR
815-DSB-GWTS-E	4/7/09	1.2	NR
815-DSB-GWTS-E	5/5/09	0.65	NR
815-DSB-GWTS-E	6/9/09	<0.5	NR
815-DSB-GWTS-I	1/12/09	<0.5	
815-DSB-GWTS-I	4/7/09	1.7	NR
815-DSB-GWTS-I	4/7/09 DUP	<0.5	NR
Building 815-Proximal[a]			
815-PRX-GWTS-E	2/11/09	74	<4
815-PRX-GWTS-E	3/3/09	78	<4
815-PRX-GWTS-E	4/6/09	76	<4
815-PRX-GWTS-E	5/5/09	95 D	<4
815-PRX-GWTS-E	6/8/09	73	<4
815-PRX-GWTS-I	2/11/09	85	6.9
815-PRX-GWTS-I	4/6/09	83 D	6.9
815-PRX-GWTS-I	4/6/09 DUP	84	6.1
Building 815-Source			
815-SRC-GWTS-E	1/7/09	98 D	<4
815-SRC-GWTS-E	2/3/09	98 D	<4
815-SRC-GWTS-E	3/3/09	100 D	<4
815-SRC-GWTS-E	4/6/09	120 D	<4
815-SRC-GWTS-E	5/5/09	100 D	<4
815-SRC-GWTS-E	6/8/09	100 D	<4
815-SRC-GWTS-I	1/7/09	100 J	5.7 O
815-SRC-GWTS-I[b]	1/13/09 DUP	-	5.1
815-SRC-GWTS-I	4/6/09	100	9.8 O
815-SRC-GWTS-I	4/6/09 DUP	100	8.5
Building 817-Proximal[c]			
817-PRX-GWTS-E	3/11/09	100 D	<4
817-PRX-GWTS-E	4/6/09	110 D	<4
817-PRX-GWTS-E	5/5/09	100 D	<4
817-PRX-GWTS-E	6/8/09	100 D	<4
817-PRX-GWTS-I	3/11/09	110 D	23
817-PRX-GWTS-I[b]	3/12/09 DUP	-	20
817-PRX-GWTS-I	4/6/09	97 D	24 D
817-PRX-GWTS-I	4/6/09 DUP	-	24 D
817-PRX-GWTS-I[b]	4/6/09	-	21
817-PRX-GWTS-I[b]	4/6/09 DUP	-	21
817-SRC-GWTS-E	2/25/09	45	<4
Building 817-Source[a]			

Table 2.4-8 (Cont.). High Explosive Process Area OU nitrate and perchlorate in ground water treatment system influent and effluent.

Location	Date	Nitrate (as NO3) (mg/L)	Perchlorate (μg/L)
817-SRC-GWTS-E	3/3/09	49	<4
817-SRC-GWTS-E	4/8/09	76	<4
817-SRC-GWTS-E	5/5/09	78	<4
817-SRC-GWTS-E	6/8/09	77	<4
817-SRC-GWTS-I	2/25/09	77	15
817-SRC-GWTS-I	4/8/09	77	<4
817-SRC-GWTS-I	4/8/09 DUP	78	<4
Building 829-Source[d]			

Notes:

[a] No samples collected in January due to freeze protection shutdown.

[b] Samples submitted to secondary contract laboratory for data comparison.

[c] No samples collected in January and February due to system electronics problems.

[d] No samples collected during this semester due to compressor power problems.

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

Table 2.4-9. High Explosive Process Area OU high explosive compounds in ground water treatment system influent and effluent.

Location	Date	1,3,5-TNB (µg/L)	1,3-DNB (µg/L)	TNT (µg/L)	2,4-DNT (µg/L)	2,6-DNT (µg/L)	2-Amino-4,6- DNT (µg/L)	2-NT (µg/L)	3-NT (µg/L)	4-Amino-2,6- DNT (µg/L)	4-NT (µg/L)	HMX (µg/L)	NB (µg/L)	RDX (µg/L)
Building 815-Proximal[a]														
815-PRX-GWTS-E	2/11/09	<3 D	<3 D	<3 D	<3 D	<3 D	<3 D	<3 D	<3 D	<3 D	<3 D	<1.5 D	<3 D	<1.5 D
815-PRX-GWTS-E	3/3/09	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<0.78	<1.6	<0.78
815-PRX-GWTS-E	4/6/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-PRX-GWTS-E	5/5/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-PRX-GWTS-E	6/8/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-PRX-GWTS-I	2/11/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-PRX-GWTS-I	4/6/09	<2 O	<2 O	<2 O	<2 O	<2	<2	<2	<2	<2	<2	<1	<2 O	<1 O
815-PRX-GWTS-I	4/6/09 DUP	<2 O	<2 O	<2 O	<2 O	<2	<2	<2	<2	<2	<2	<1	<2 O	<1 O
Building 815-Source														
815-SRC-GWTS-E	1/7/09	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<1 IJ	<2 IJ	<1 IJ
815-SRC-GWTS-E	2/3/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-SRC-GWTS-E	3/3/09	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<1.6 IJ	<0.78 IJ	<1.6 IJ	<0.78 IJ
815-SRC-GWTS-E	4/6/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-SRC-GWTS-E	5/5/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-SRC-GWTS-E	6/8/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
815-SRC-GWTS-I	1/7/09	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	5.3 IJ	<2 IJ	48 IJ
815-SRC-GWTS-I	4/6/09	<2 O	<2 O	<2 O	<2 O	<2	<2	<2	<2	<2	<2	6.3	<2 O	57 O
815-SRC-GWTS-I	4/6/09 DUP	<2 O	<2 O	<2 O	<2 O	<2	<2	<2	<2	<2	<2	6.2	<2 O	60 O
Building 817-Proximal[b]														
817-PRX-GWTS-E	3/10/09	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.71	<1.4	<0.71
817-PRX-GWTS-E	4/6/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
817-PRX-GWTS-E	5/5/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
817-PRX-GWTS-E	6/8/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
817-PRX-GWTS-I	3/11/09	<2 IJ	<2 OIJ	<2 OIJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<2 IJ	<1 OIJ	<2 OIJ	6.1 OIJ
817-PRX-GWTS-I	4/6/09	<2 O	<2 O	<2 O	<2 O	<2	<2	<2	<2	<2	<2	<1	<2 O	7.1 O
817-PRX-GWTS-I	4/6/09 DUP	<2 O	<2 O	<2 O	<2 O	<2	<2	<2	<2	<2	<2	<1	<2 O	6.6 O
Building 817-Source[a]														

Table 2.4-9. High Explosive Process Area OU high explosive compounds in ground water treatment system influent and effluent.

Location	Date	1,3,5-TNB (µg/L)	1,3-DNB (µg/L)	TNT (µg/L)	2,4-DNT (µg/L)	2,6-DNT (µg/L)	2-Amino-4,6- DNT (µg/L)	2-NT (µg/L)	3-NT (µg/L)	4-Amino-2,6- DNT (µg/L)	4-NT (µg/L)	HMX (µg/L)	NB (µg/L)	RDX (µg/L)
817-SRC-GWTS-E	2/25/09	<1.4	<1.4 O	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69	<1.4 O	<0.69 O
817-SRC-GWTS-E	3/3/09	<2	<2	<2 O	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
817-SRC-GWTS-E	4/8/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1 O
817-SRC-GWTS-E	5/5/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
817-SRC-GWTS-E	6/8/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<2	<1
817-SRC-GWTS-I	2/25/09	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<0.72	<2	<0.72
817-SRC-GWTS-I	4/8/09	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69	<1.4	<0.69
817-SRC-GWTS-I	4/8/09 DUP	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69	<1.4	<0.69
Building 829-Source[c]														

Notes:

[a] No samples collected in January due to freeze protection shutdown.

[b] No samples collected in January and February due to system electronics problems.

[c] High Explosive monitoring at 829-SRC-GWTS not required.

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

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

Sample location	Sample identification	Parameter	Frequency
815-SRC GWTS			
Influent Port	**815-SRC-I**	**VOCs**	**Quarterly**
		HE Compounds	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**815-SRC-E**	**VOCs**	**Monthly**
		HE Compounds	**Monthly**
		Perchlorate	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**
815-PRX GWTS			
Influent Port	**815-PRX-I**	**VOCs**	**Quarterly**
		HE Compounds	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**815-PRX-E**	**VOCs**	**Monthly**
		HE Compounds	**Monthly**
		Perchlorate	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**
815-DSB GWTS			
Influent Port	**815-DSB-I**	**VOCs**	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**815-DSB-E**	**VOCs**	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**

Table 2.4-10 (Cont.). High Explosives Process Area OU treatment facility sampling and analysis plans.

Sample location	Sample identification	Parameter	Frequency
817-SRC GWTS			
Influent Port	**817-SRC-I**	**VOCs**	**Quarterly**
		HE Compounds	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**817-SRC-E**	**VOCs**	**Monthly**
		HE Compounds	**Monthly**
		Perchlorate	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**
817-PRX GWTS			
Influent Port	**817-PRX-I**	**VOCs**	**Quarterly**
		HE Compounds	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**817-PRX-E**	**VOCs**	**Monthly**
		HE Compounds	**Monthly**
		Perchlorate	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**
829-SRC GWTS			
Influent Port	**W-829-06-829-SRC-I**	**VOCs**	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**829-SRC-BTU-I**	**VOCs**	**Monthly**
Effluent Port	**829-SRC-E**	**Perchlorate**	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**

Notes:

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 OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	1	Y	
GALLO1*	WS	$Tnbs_2$		WGMG	E502.2	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	1	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	2	Y	
GALLO1*	WS	$Tnbs_2$		WGMG	E502.2	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	2	Y	
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	3		
GALLO1*	WS	$Tnbs_2$		WGMG	E502.2	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	3		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:NO3	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E300.0:PERC	4		
GALLO1*	WS	$Tnbs_2$		WGMG	E502.2	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	4		

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E601	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	4		
GALLO1*	WS	$Tnbs_2$	M	CMP	E8330	4		
SPRING14	SPR	$Tnbs_2$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.
SPRING14	SPR	$Tnbs_2$	B	CMP	E300.0:PERC	1	Y	Next sample required 1stQ 2011.
SPRING14	SPR	$Tnbs_2$	B	CMP	E601	1	Y	Next sample required 1stQ 2011.
SPRING14	SPR	$Tnbs_2$	B	CMP	E8330	1	Y	Next sample required 1stQ 2011.
SPRING5	SPR	Tps	A	CMP	E300.0:NO3	1	N	Dry. Sampled as W-817-03A.
SPRING5	SPR	Tps	A	CMP	E300.0:PERC	1	N	Dry. Sampled as W-817-03A.
SPRING5	SPR	Tps	S	CMP	E601	1	N	Dry. Sampled as W-817-03A.
SPRING5	SPR	Tps	A	CMP	E8330	1	N	Dry. Sampled as W-817-03A.
SPRING5	SPR	Tps	S	CMP	E601	3		Sampled as W-817-03A.
W-35B-01	GW	Qal	S	CMP	E300.0:NO3	1	Y	
W-35B-01	GW	Qal	S	CMP	E300.0:PERC	1	Y	
W-35B-01	GW	Qal	Q	CMP	E601	1	Y	
W-35B-01	GW	Qal	S	CMP	E8330	1	Y	
W-35B-01	GW	Qal	Q	CMP	E601	2	Y	
W-35B-01	GW	Qal	S	CMP	E300.0:NO3	3		
W-35B-01	GW	Qal	S	CMP	E300.0:PERC	3		
W-35B-01	GW	Qal	Q	CMP	E601	3		
W-35B-01	GW	Qal	S	CMP	E8330	3		
W-35B-01	GW	Qal	Q	CMP	E601	4		
W-35B-02	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-35B-02	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-35B-02	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-35B-02	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-35B-02	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-35B-02	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-35B-02	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-35B-02	GW	$Tnbs_2$	Q	CMP	E601	3		
W-35B-02	GW	$Tnbs_2$	S	CMP	E8330	3		
W-35B-02	GW	$Tnbs_2$	Q	CMP	E601	4		
W-35B-03	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-35B-03	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-35B-03	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-35B-03	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-35B-03	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-35B-03	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-35B-03	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-35B-03	GW	$Tnbs_2$	Q	CMP	E601	3		
W-35B-03	GW	$Tnbs_2$	S	CMP	E8330	3		
W-35B-03	GW	$Tnbs_2$	Q	CMP	E601	4		
W-35B-04	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-35B-04	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-35B-04	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-35B-04	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-35B-04	GW	$Tnbs_2$	Q	CMP	E601	2	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-35B-04	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-35B-04	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-35B-04	GW	$Tnbs_2$	Q	CMP	E601	3		
W-35B-04	GW	$Tnbs_2$	S	CMP	E8330	3		
W-35B-04	GW	$Tnbs_2$	Q	CMP	E601	4		
W-35B-05	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-35B-05	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-35B-05	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-35B-05	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-35B-05	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-35B-05	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-35B-05	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-35B-05	GW	$Tnbs_2$	Q	CMP	E601	3		
W-35B-05	GW	$Tnbs_2$	S	CMP	E8330	3		
W-35B-05	GW	$Tnbs_2$	Q	CMP	E601	4		
W-35C-01	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-35C-01	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	Y	
W-35C-01	PTMW	$Tnsc_2$	S	CMP	E601	1	Y	
W-35C-01	PTMW	$Tnsc_2$	A	CMP	E8330	1	Y	
W-35C-01	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-35C-02	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-35C-02	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-35C-02	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
W-35C-02	PTMW	$Tnbs_1$	A	CMP	E8330	1	Y	
W-35C-02	PTMW	$Tnbs_1$	S	CMP	E601	3		
W-35C-04	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	815-DSB extraction well.
W-35C-04	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	815-DSB extraction well.
W-35C-04	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	815-DSB extraction well.
W-35C-04	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	815-DSB extraction well.
W-35C-04	EW	$Tnbs_2$		DIS	E601	2	Y	815-DSB extraction well.
W-35C-04	EW	$Tnbs_2$	S	CMP-TF	E601	3		815-DSB extraction well.
W-35C-05	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-35C-05	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-35C-05	PTMW	Tps	S	CMP	E601	1	Y	
W-35C-05	PTMW	Tps	A	CMP	E8330	1	Y	
W-35C-05	PTMW	Tps	S	CMP	E601	3		
W-35C-06	PTMW	Qal	A	CMP	E300.0:NO3	1	Y	
W-35C-06	PTMW	Qal	A	CMP	E300.0:PERC	1	Y	
W-35C-06	PTMW	Qal	S	CMP	E601	1	Y	
W-35C-06	PTMW	Qal	A	CMP	E8330	1	Y	
W-35C-06	PTMW	Qal	S	CMP	E601	3		
W-35C-07	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-35C-07	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	Y	
W-35C-07	PTMW	$Tnsc_2$	S	CMP	E601	1	Y	
W-35C-07	PTMW	$Tnsc_2$	A	CMP	E8330	1	Y	
W-35C-07	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-35C-08	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-35C-08	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	Y	
W-35C-08	PTMW	$Tnsc_2$	S	CMP	E601	1	Y	
W-35C-08	PTMW	$Tnsc_2$	A	CMP	E8330	1	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-35C-08	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-4A	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-4A	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-4A	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-4A	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-4A	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-4AS	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-4AS	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-4AS	PTMW	Tps	S	CMP	E601	1	Y	
W-4AS	PTMW	Tps	A	CMP	E8330	1	Y	
W-4AS	PTMW	Tps	S	CMP	E601	3		
W-4B	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-4B	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-4B	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-4B	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-4B	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-4C	GW	$Tnsc_1$	S	CMP	E300.0:NO3	1	Y	
W-4C	GW	$Tnsc_1$	S	CMP	E300.0:PERC	1	Y	
W-4C	GW	$Tnsc_1$	Q	CMP	E601	1	Y	
W-4C	GW	$Tnsc_1$	Q	CMP	E601	2	Y	
W-4C	GW	$Tnsc_1$	S	CMP	E300.0:NO3	3		
W-4C	GW	$Tnsc_1$	S	CMP	E300.0:PERC	3		
W-4C	GW	$Tnsc_1$	Q	CMP	E601	3		
W-4C	GW	$Tnsc_1$	Q	CMP	E601	4		
W-6BD	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-6BD	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-6BD	PTMW	Tps	S	CMP	E601	1	Y	
W-6BD	PTMW	Tps	A	CMP	E8330	1	Y	
W-6BD	PTMW	Tps	S	CMP	E601	3		
W-6BS	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-6BS	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-6BS	PTMW	Tps	S	CMP	E601	1	Y	
W-6BS	PTMW	Tps	A	CMP	E8330	1	Y	
W-6BS	PTMW	Tps	S	CMP	E601	3		
W-6CD	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-6CD	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-6CD	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-6CD	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-6CD	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-6CI	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-6CI	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	Y	
W-6CI	PTMW	$Tnsc_2$	S	CMP	E601	1	Y	
W-6CI	PTMW	$Tnsc_2$	A	CMP	E8330	1	Y	
W-6CI	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-6CS	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-6CS	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-6CS	PTMW	Tps	S	CMP	E601	1	Y	
W-6CS	PTMW	Tps	A	CMP	E8330	1	Y	
W-6CS	PTMW	Tps	S	CMP	E601	3		
W-6EI	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-6EI	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	Y	
W-6EI	PTMW	$Tnsc_2$	S	CMP	E601	1	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-6EI	PTMW	$Tnsc_2$	A	CMP	E8330	1	Y	
W-6EI	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-6ER	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	815-DSB extraction well.
W-6ER	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	815-DSB extraction well.
W-6ER	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	815-DSB extraction well.
W-6ER	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	815-DSB extraction well.
W-6ER	EW	$Tnbs_2$		DIS	E601	2	Y	815-DSB extraction well.
W-6ER	EW	$Tnbs_2$	S	CMP-TF	E601	3		815-DSB extraction well.
W-6ES	PTMW	Qal	A	CMP	E300.0:NO3	1	Y	
W-6ES	PTMW	Qal	A	CMP	E300.0:PERC	1	Y	
W-6ES	PTMW	Qal	S	CMP	E601	1	Y	
W-6ES	PTMW	Qal	A	CMP	E8330	1	Y	
W-6ES	PTMW	Qal	S	CMP	E601	3		
W-6F	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-6F	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-6F	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-6F	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-6F	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-6G	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-6G	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-6G	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-6G	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-6G	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-6H	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-6H	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-6H	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-6H	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-6H	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-6H	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-6H	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-6H	GW	$Tnbs_2$	Q	CMP	E601	3		
W-6H	GW	$Tnbs_2$	S	CMP	E8330	3		
W-6H	GW	$Tnbs_2$	Q	CMP	E601	4		
W-6I	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-6I	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-6I	PTMW	Tps	S	CMP	E601	1	Y	
W-6I	PTMW	Tps	A	CMP	E8330	1	Y	
W-6I	PTMW	Tps	S	CMP	E601	3		
W-6J	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-6J	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-6J	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-6J	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-6J	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-6J	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-6J	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-6J	GW	$Tnbs_2$	Q	CMP	E601	3		
W-6J	GW	$Tnbs_2$	S	CMP	E8330	3		
W-6J	GW	$Tnbs_2$	Q	CMP	E601	4		
W-6K	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-6K	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-6K	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-6K	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-6K	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-6L	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-6L	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-6L	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-6L	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-6L	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-806-06A	MWB	$Tnsc_1$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.
W-806-06A	MWB	$Tnsc_1$	B	CMP	E300.0:PERC	1	Y	Next sample required 1stQ 2011.
W-806-06A	MWB	$Tnsc_1$	B	CMP	E601	1	Y	Next sample required 1stQ 2011.
W-806-06A	MWB	$Tnsc_1$	B	CMP	E8330	1	Y	Next sample required 1stQ 2011.
W-806-07	MWB	$Tnbs_2$	B	CMP	E300.0:NO3	1	N	Dry. Next sample required 1stQ 2011.
W-806-07	MWB	$Tnbs_2$	B	CMP	E300.0:PERC	1	N	Dry. Next sample required 1stQ 2011.
W-806-07	MWB	$Tnbs_2$	B	CMP	E601	1	N	Dry. Next sample required 1stQ 2011.
W-806-07	MWB	$Tnbs_2$	B	CMP	E8330	1	N	Dry. Next sample required 1stQ 2011.
W-808-01	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-808-01	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-808-01	PTMW	Tps	S	CMP	E601	1	Y	
W-808-01	PTMW	Tps	A	CMP	E8330	1	Y	
W-808-01	PTMW	Tps	S	CMP	E601	3		
W-808-02	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	N	Dry.
W-808-02	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	N	Dry.
W-808-02	PTMW	$Tnsc_2$	S	CMP	E601	1	N	Dry.
W-808-02	PTMW	$Tnsc_2$	A	CMP	E8330	1	N	Dry.
W-808-02	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-808-03	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-808-03	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-808-03	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
W-808-03	PTMW	$Tnbs_1$	A	CMP	E8330	1	Y	
W-808-03	PTMW	$Tnbs_1$	S	CMP	E601	3		
W-809-01	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-809-01	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-809-01	PTMW	Tps	S	CMP	E601	1	Y	
W-809-01	PTMW	Tps	A	CMP	E8330	1	Y	
W-809-01	PTMW	Tps	S	CMP	E601	3		
W-809-02	PTMW	$Tnbs_2$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.
W-809-02	PTMW	$Tnbs_2$		DIS	E300.0:PERC	1	Y	
W-809-02	PTMW	$Tnbs_2$		DIS	E601	1	Y	
W-809-02	PTMW	$Tnbs_2$	B	CMP	E8330	1	Y	Next sample required 1stQ 2011.
W-809-02	PTMW	$Tnbs_2$		DIS	E300.0:PERC	3		
W-809-03	PTMW	$Tnbs_2$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.
W-809-03	PTMW	$Tnbs_2$		DIS	E300.0:PERC	1	Y	
W-809-03	PTMW	$Tnbs_2$		DIS	E601	1	Y	
W-809-03	PTMW	$Tnbs_2$		DIS	E8330	1	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-809-03	PTMW	$Tnbs_2$		DIS	E300.0:PERC	3		
W-809-04	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-809-04	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-809-04	PTMW	Tps	S	CMP	E601	1	Y	
W-809-04	PTMW	Tps	A	CMP	E8330	1	Y	
W-809-04	PTMW	Tps	S	CMP	E601	3		
W-810-01	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-810-01	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-810-01	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
W-810-01	PTMW	$Tnbs_1$	A	CMP	E8330	1	Y	
W-810-01	PTMW	$Tnbs_1$	S	CMP	E601	3		
W-814-01	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-814-01	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-814-01	PTMW	Tps	S	CMP	E601	1	Y	
W-814-01	PTMW	Tps	A	CMP	E8330	1	Y	
W-814-01	PTMW	Tps	S	CMP	E601	3		
W-814-02	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-814-02	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-814-02	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-814-02	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-814-02	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-814-03	PTMW	Tps	A	CMP	E300.0:NO3	1	N	Dry.
W-814-03	PTMW	Tps	A	CMP	E300.0:PERC	1	N	Dry.
W-814-03	PTMW	Tps	S	CMP	E601	1	N	Dry.
W-814-03	PTMW	Tps	A	CMP	E8330	1	N	Dry.
W-814-03	PTMW	Tps	S	CMP	E601	3		
W-814-04	GW	$Tnsc_1$	S	CMP	E300.0:NO3	1	Y	
W-814-04	GW	$Tnsc_1$	S	CMP	E300.0:PERC	1	Y	
W-814-04	GW	$Tnsc_1$	Q	CMP	E601	1	Y	
W-814-04	GW	$Tnsc_1$		DIS	E8330	1	Y	
W-814-04	GW	$Tnsc_1$	Q	CMP	E601	2	Y	
W-814-04	GW	$Tnsc_1$	S	CMP	E300.0:NO3	3		
W-814-04	GW	$Tnsc_1$	S	CMP	E300.0:PERC	3		
W-814-04	GW	$Tnsc_1$	Q	CMP	E601	3		
W-814-04	GW	$Tnsc_1$	Q	CMP	E601	4		
W-814-2138	PTMW	Tpsg	A	CMP	E300.0:NO3	1	Y	
W-814-2138	PTMW	Tpsg	A	CMP	E300.0:PERC	1	Y	
W-814-2138	PTMW	Tpsg	A	CMP	E601	1	Y	
W-814-2138	PTMW	Tpsg	A	CMP	E8330	1	Y	
W-815-01	PTMW	Tps	A	CMP	E300.0:NO3	1	N	Dry.
W-815-01	PTMW	Tps	A	CMP	E300.0:PERC	1	N	Dry.
W-815-01	PTMW	Tps	S	CMP	E601	1	N	Dry.
W-815-01	PTMW	Tps	A	CMP	E8330	1	N	Dry.
W-815-01	PTMW	Tps	S	CMP	E601	3		
W-815-02	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	815-SRC extraction well.
W-815-02	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	815-SRC extraction well.
W-815-02	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	815-SRC extraction well.
W-815-02	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	815-SRC extraction well.
W-815-02	EW	$Tnbs_2$		DIS	E601	2	Y	815-SRC extraction well.
W-815-02	EW	$Tnbs_2$	S	CMP-TF	E601	3		815-SRC extraction well.
W-815-03	PTMW	Tps	A	CMP	E300.0:NO3	1	N	Dry.
W-815-03	PTMW	Tps	A	CMP	E300.0:PERC	1	N	Dry.
W-815-03	PTMW	Tps	S	CMP	E601	1	N	Dry.
W-815-03	PTMW	Tps	A	CMP	E8330	1	N	Dry.
W-815-03	PTMW	Tps	S	CMP	E601	3		

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-815-04	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	815-SRC extraction well.
W-815-04	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	815-SRC extraction well.
W-815-04	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	815-SRC extraction well.
W-815-04	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	815-SRC extraction well.
W-815-04	EW	$Tnbs_2$		DIS	E601	2	Y	815-SRC extraction well.
W-815-04	EW	$Tnbs_2$	S	CMP-TF	E601	3		815-SRC extraction well.
W-815-05	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-815-05	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-815-05	PTMW	Tps	S	CMP	E601	1	Y	
W-815-05	PTMW	Tps	A	CMP	E8330	1	Y	
W-815-05	PTMW	Tps	S	CMP	E601	3		
W-815-06	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-815-06	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-815-06	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-815-06	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-815-06	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-815-07	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-815-07	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-815-07	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-815-07	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-815-07	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-815-08	GW	$Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
W-815-08	GW	$Tnbs_1$	S	CMP	E300.0:PERC	1	Y	
W-815-08	GW	$Tnbs_1$	Q	CMP	E601	1	Y	
W-815-08	GW	$Tnbs_1$	S	CMP	E8330	1	Y	
W-815-08	GW	$Tnbs_1$	Q	CMP	E601	2	Y	
W-815-08	GW	$Tnbs_1$	S	CMP	E300.0:NO3	3		
W-815-08	GW	$Tnbs_1$	S	CMP	E300.0:PERC	3		
W-815-08	GW	$Tnbs_1$	Q	CMP	E601	3		
W-815-08	GW	$Tnbs_1$	S	CMP	E8330	3		
W-815-08	GW	$Tnbs_1$	Q	CMP	E601	4		
W-815-1928	PTMW	Tps	A	CMP	E300.0:NO3	1	N	Dry.
W-815-1928	PTMW	Tps	A	CMP	E300.0:PERC	1	N	Dry.
W-815-1928	PTMW	Tps	S	CMP	E601	1	N	Dry.
W-815-1928	PTMW	Tps	A	CMP	E8330	1	N	Dry.
W-815-1928	PTMW	Tps	S	CMP	E601	3		
W-815-2110	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-815-2110	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-815-2110	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-815-2110	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-815-2110	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-815-2110	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-815-2110	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-815-2110	GW	$Tnbs_2$	Q	CMP	E601	3		
W-815-2110	GW	$Tnbs_2$	S	CMP	E8330	3		
W-815-2110	GW	$Tnbs_2$	Q	CMP	E601	4		
W-815-2111	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-815-2111	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-815-2111	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-815-2111	GW	$Tnbs_2$	S	CMP	E8330	1	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-815-2111	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-815-2111	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-815-2111	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-815-2111	GW	$Tnbs_2$	Q	CMP	E601	3		
W-815-2111	GW	$Tnbs_2$	S	CMP	E8330	3		
W-815-2111	GW	$Tnbs_2$	Q	CMP	E601	4		
W-815-2217	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-815-2217	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-815-2217	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-815-2217	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-815-2217	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-817-01	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E300.0:NO3	2	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E300.0:PERC	2	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E601	2	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E8330	2	Y	817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E300.0:NO3	3		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E300.0:PERC	3		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$	S	CMP-TF	E601	3		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E8330	3		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E300.0:NO3	4		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E300.0:PERC	4		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E601	4		817-SRC extraction well.
W-817-01	EW	$Tnbs_2$		DIS	E8330	4		817-SRC extraction well.
W-817-03	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	817-PRX extraction well.
W-817-03	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	817-PRX extraction well.
W-817-03	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	817-PRX extraction well.
W-817-03	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	817-PRX extraction well.
W-817-03	EW	$Tnbs_2$		DIS	E601	2	Y	817-PRX extraction well.
W-817-03	EW	$Tnbs_2$	S	CMP-TF	E601	3		817-PRX extraction well.
W-817-03	EW	$Tnbs_2$		DIS	E601	4		817-PRX extraction well.
W-817-03A	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-817-03A	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-817-03A	PTMW	Tps	S	CMP	E601	1	Y	
W-817-03A	PTMW	Tps	A	CMP	E8330	1	Y	
W-817-03A	PTMW	Tps	S	CMP	E601	3		
W-817-04	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	Changed to PTMW.
W-817-04	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	Changed to PTMW.
W-817-04	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	Changed to PTMW.
W-817-04	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	Changed to PTMW.
W-817-04	PTMW	$Tnbs_2$	S	CMP	E601	3		Changed to PTMW.
W-817-05	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
W-817-05	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
W-817-05	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
W-817-05	PTMW	$Tnsc_1$	A	CMP	E8330	1	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-817-05	PTMW	$Tnsc_1$	S	CMP	E601	3		
W-817-07	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-817-07	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-817-07	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-817-07	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-817-07	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-817-2318	EW	Tpsg	A	CMP	E300.0:NO3	1	Y	817-PRX extraction well.
W-817-2318	EW	Tpsg	A	CMP	E300.0:PERC	1	Y	817-PRX extraction well.
W-817-2318	EW	Tpsg	S	CMP	E601	1	Y	817-PRX extraction well.
W-817-2318	EW	Tpsg	A	CMP	E8330	1	Y	817-PRX extraction well.
W-817-2318	EW	Tpsg		DIS	E601	2	Y	817-PRX extraction well.
W-817-2318	EW	Tpsg		DIS	E300.0:NO3	3		817-PRX extraction well.
W-817-2318	EW	Tpsg		DIS	E300.0:PERC	3		817-PRX extraction well.
W-817-2318	EW	Tpsg	S	CMP	E601	3		817-PRX extraction well.
W-817-2318	EW	Tpsg		DIS	E8330	3		817-PRX extraction well.
W-817-2318	EW	Tpsg		DIS	E601	4		817-PRX extraction well.
W-818-01	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-818-01	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-818-01	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-818-01	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-818-01	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-818-03	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-818-03	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-818-03	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-818-03	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-818-03	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-818-04	PTMW	$Tnsc_2$	A	CMP	E300.0:NO3	1	Y	
W-818-04	PTMW	$Tnsc_2$	A	CMP	E300.0:PERC	1	Y	
W-818-04	PTMW	$Tnsc_2$	S	CMP	E601	1	Y	
W-818-04	PTMW	$Tnsc_2$	A	CMP	E8330	1	Y	
W-818-04	PTMW	$Tnsc_2$	S	CMP	E601	3		
W-818-06	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-818-06	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-818-06	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-818-06	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-818-06	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-818-07	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-818-07	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-818-07	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-818-07	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-818-07	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-818-08	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	815-PRX extraction well.
W-818-08	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	815-PRX extraction well.
W-818-08	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	815-PRX extraction well.
W-818-08	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	815-PRX extraction well.
W-818-08	EW	$Tnbs_2$		DIS	E601	2	Y	815-PRX extraction well.
W-818-08	EW	$Tnbs_2$	S	CMP-TF	E601	3		815-PRX extraction well.
W-818-09	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	815-PRX extraction well.
W-818-09	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	815-PRX extraction well.
W-818-09	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	815-PRX extraction well.

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-818-09	EW	$Tnbs_2$	A	CMP-TF	E8330	1	Y	815-PRX extraction well.
W-818-09	EW	$Tnbs_2$		DIS	E601	2	Y	815-PRX extraction well.
W-818-09	EW	$Tnbs_2$		DIS	E624	2	Y	815-PRX extraction well.
W-818-09	EW	$Tnbs_2$	S	CMP-TF	E601	3		815-PRX extraction well.
W-818-11	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-818-11	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-818-11	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-818-11	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-818-11	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-819-02	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
W-819-02	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
W-819-02	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
W-819-02	PTMW	$Tnsc_1$	A	CMP	E8330	1	Y	
W-819-02	PTMW	$Tnsc_1$	S	CMP	E601	3		
W-823-01	PTMW	Tps	A	CMP	E300.0:NO3	1	Y	
W-823-01	PTMW	Tps	A	CMP	E300.0:PERC	1	Y	
W-823-01	PTMW	Tps	S	CMP	E601	1	Y	
W-823-01	PTMW	Tps	A	CMP	E8330	1	Y	
W-823-01	PTMW	Tps	S	CMP	E601	3		
W-823-02	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-823-02	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-823-02	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-823-02	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-823-02	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-823-02	PTMW	$Tnbs_2$		DIS	EM8015:DIESEL	3		
W-823-03	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-823-03	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-823-03	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-823-03	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-823-03	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-823-13	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-823-13	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-823-13	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-823-13	PTMW	$Tnbs_2$	A	CMP	E8330	1	Y	
W-823-13	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-827-01	MWB	$Tnbs_2$	B	CMP	E300.0:NO3	1	N	Dry. Next sample required 1stQ 2011.
W-827-01	MWB	$Tnbs_2$	B	CMP	E300.0:PERC	1	N	Dry. Next sample required 1stQ 2011.
W-827-01	MWB	$Tnbs_2$	B	CMP	E601	1	N	Dry. Next sample required 1stQ 2011.
W-827-01	MWB	$Tnbs_2$	B	CMP	E8330	1	N	Dry. Next sample required 1stQ 2011.
W-827-02	MWB	$Tnsc_1$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.
W-827-02	MWB	$Tnsc_1$	B	CMP	E300.0:PERC	1	Y	Next sample required 1stQ 2011.
W-827-02	MWB	$Tnsc_1$	B	CMP	E601	1	Y	Next sample required 1stQ 2011.
W-827-02	MWB	$Tnsc_1$	B	CMP	E8330	1	Y	Next sample required 1stQ 2011.
W-827-03	MWB	$Tnsc_1$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-827-03	MWB	$Tnsc_1$	B	CMP	E300.0:PERC	1	Y	Next sample required 1stQ 2011.
W-827-03	MWB	$Tnsc_1$	B	CMP	E601	1	Y	Next sample required 1stQ 2011.
W-827-03	MWB	$Tnsc_1$	B	CMP	E8330	1	Y	Next sample required 1stQ 2011.
W-827-05	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-827-05	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-827-05	PTMW	$Tnbs_1$	S	CMP	E601	1	Y	
W-827-05	PTMW	$Tnbs_1$	A	CMP	E8330	1	Y	
W-827-05	PTMW	$Tnbs_1$	S	CMP	E601	3		
W-829-06	EW	$Tnsc_1$	A	CMP-TF	E300.0:NO3	1	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$	A	CMP-TF	E300.0:PERC	1	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$	S	CMP-TF	E601	1	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$		DIS	E300.0:NO3	2	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$		DIS	E300.0:PERC	2	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$		DIS	E601	2	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$	A	CMP-TF	E8330	2	N	829-SRC extraction well. Pump was non-operational.
W-829-06	EW	$Tnsc_1$	S	CMP-TF	E601	3	N	829-SRC extraction well. Pump was non-operational.
W-829-15	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
W-829-15	DMW	$Tnbs_1$		WGMG	E624	2	Y	
W-829-15	DMW	$Tnbs_1$		WGMG	E8330	2	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	ANIONS	1	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E624	1	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E8330	1	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E8330:TNT	1	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E624	2	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E8330	2	Y	
W-829-1938	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
W-829-1938	DMW	$Tnbs_1$		WGMG	E624	3		
W-829-1938	DMW	$Tnbs_1$		WGMG	E8330	3		
W-829-1938	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
W-829-1938	DMW	$Tnbs_1$		WGMG	E624	4		
W-829-1938	DMW	$Tnbs_1$		WGMG	E8330	4		
W-829-1940	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
W-829-1940	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
W-829-1940	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
W-829-1940	PTMW	$Tnsc_1$	A	CMP	E8330	1	Y	
W-829-1940	PTMW	$Tnsc_1$	S	CMP	E601	3		
W-829-1940	PTMW	$Tnsc_1$		DIS	E8330	3		
W-829-22	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
W-829-22	DMW	$Tnbs_1$		WGMG	E624	2	Y	
W-829-22	DMW	$Tnbs_1$		WGMG	E8330	2	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-880-01	GW	$Tnbs_2$	S	CMP	E300.0:NO3	1	Y	
W-880-01	GW	$Tnbs_2$	S	CMP	E300.0:PERC	1	Y	
W-880-01	GW	$Tnbs_2$	Q	CMP	E601	1	Y	
W-880-01	GW	$Tnbs_2$	S	CMP	E8330	1	Y	
W-880-01	GW	$Tnbs_2$	Q	CMP	E601	2	Y	
W-880-01	GW	$Tnbs_2$	S	CMP	E300.0:NO3	3		
W-880-01	GW	$Tnbs_2$	S	CMP	E300.0:PERC	3		
W-880-01	GW	$Tnbs_2$	Q	CMP	E601	3		
W-880-01	GW	$Tnbs_2$	S	CMP	E8330	3		
W-880-01	GW	$Tnbs_2$	Q	CMP	E601	4		
W-880-02	GW	Qal	S	CMP	E300.0:NO3	1	Y	
W-880-02	GW	Qal	S	CMP	E300.0:PERC	1	Y	
W-880-02	GW	Qal	Q	CMP	E601	1	Y	
W-880-02	GW	Qal	S	CMP	E8330	1	Y	
W-880-02	GW	Qal	Q	CMP	E601	2	Y	
W-880-02	GW	Qal	S	CMP	E300.0:NO3	3		
W-880-02	GW	Qal	S	CMP	E300.0:PERC	3		
W-880-02	GW	Qal	Q	CMP	E601	3		
W-880-02	GW	Qal	S	CMP	E8330	3		
W-880-02	GW	Qal	Q	CMP	E601	4		
W-880-03	GW	$Tnsc_1$	S	CMP	E300.0:NO3	1	N	Dry.
W-880-03	GW	$Tnsc_1$	S	CMP	E300.0:PERC	1	N	Dry.
W-880-03	GW	$Tnsc_1$	Q	CMP	E601	1	N	Dry.
W-880-03	GW	$Tnsc_1$	S	CMP	E8330	1	N	Dry.
W-880-03	GW	$Tnsc_1$	Q	CMP	E601	2	N	Inoperable pump.
W-880-03	GW	$Tnsc_1$	S	CMP	E300.0:NO3	3		
W-880-03	GW	$Tnsc_1$	S	CMP	E300.0:PERC	3		
W-880-03	GW	$Tnsc_1$	Q	CMP	E601	3		
W-880-03	GW	$Tnsc_1$	S	CMP	E8330	3		
W-880-03	GW	$Tnsc_1$	Q	CMP	E601	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	1	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	2	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	2	Y	
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	3		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E601	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	4		
WELL 18*	WS	$Tnbs_1$	M	CMP	E8330	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	1	Y	
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	1	Y	
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	1	Y	
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E601	1	N	See 502.2
WELL 20*	WS	$Tnbs_1$	M	CMP	E601	1	N	See 502.2
WELL 20*	WS	$Tnbs_1$	M	CMP	E601	1	N	See 502.2
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	1	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	2	Y	

Table 2.4-11 (Cont.). High Explosives Process Area OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	2	Y	
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	2	Y	
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	2	Y	
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	2	Y	
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	3		
WELL 20*	WS	$Tnbs_1$	M	WGMG	E502.2	3		
WELL 20*	WS	$Tnbs_1$	M	WGMG	E502.2	3		
WELL 20*	WS	$Tnbs_1$	M	WGMG	E502.2	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	3		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:NO3	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E300.0:PERC	4		
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	4		
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	4		
WELL 20*	WS	$Tnbs_1$		WGMG	E502.2	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E601	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E601	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E601	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	4		
WELL 20*	WS	$Tnbs_1$	M	CMP	E8330	4		

Notes:

***Well sampled as part of the surveillance monitoring performed by the Water Guidance and Monitoring Group (WGMG) for additional constiutents and the results are reported in the LLNL Site Annual Environmental Report.**

W-829-15, W-829-22, and W-829-1938 are detection monitoring wells. Analytes and sampling frequency are specified in the RCRA Closure Plan for the High Explosives Open Burn Facility.

HEPA primary COC: VOCs (E601, E502.2, or E624).
HEPA secondary COC: nitrate (E300:NO3).
HEPA secondary COC: perchlorate (E300.0:PERC).
HEPA secondary COC: RDX (E8330).

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

Table 2.4-12. Building 815-Source (815-SRC) mass removed, January 1, 2009 through June 30, 2009.

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-SRC	January	NA	1.1	1.4	19	10	NA
	February	NA	1.0	1.4	18	9.4	NA
	March	NA	1.3	1.7	23	12	NA
	April	NA	0.93	1.2	16	8.2	NA
	May	NA	1.1	1.4	19	9.6	NA
	June	NA	1.3	1.6	22	11	NA
Total		NA	6.7	8.6	120	60	NA

Notes:

***Nitrate re-injected into the $Tnbs_2$ HSU undergoes in-situ biotransformation to benign N_2 gas by anaerobic denitrifying bacteria.**

Table 2.4-13. Building 815-Proximal (815-PRX) mass removed, January 1, 2009 through June 30, 2009.

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-PRX	January	NA	0	0	0	NA	NA
	February	NA	3.5	0.97	12	NA	NA
	March	NA	9.8	2.7	32	NA	NA
	April	NA	12	2.6	27	NA	NA
	May	NA	4.5	1.1	13	NA	NA
	June	NA	5.8	1.5	18	NA	NA
Total		NA	36	8.9	100	NA	NA

Notes:

***Nitrate re-injected into the $Tnbs_2$ HSU undergoes in-situ biotransformation to benign N_2 gas by anaerobic denitrifying bacteria.**

Table 2.4-14. Building 815-Distal Site Boundary (815-DSB) mass removed, January 1, 2009 through June 30, 2009.

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	3.8	NA	NA	NA	NA
	February	NA	1.3	NA	NA	NA	NA
	March	NA	3.1	NA	NA	NA	NA
	April	NA	8.3	NA	NA	NA	NA
	May	NA	7.8	NA	NA	NA	NA
	June	NA	6.9	NA	NA	NA	NA
Total		NA	31	NA	NA	NA	NA

Table 2.4-15. Building 817-Source (817-SRC) mass removed, January 1, 2009 through June 30, 2009.

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	0.0020	0.011	0	NA
	March	NA	0	0.0033	0.017	0	NA
	April	NA	0	0	0.022	0	NA
	May	NA	0	0	0.038	0	NA
	June	NA	0	0	0.047	0	NA
Total		NA	0	0.0053	0.13	0	NA

Notes:

***Nitrate re-injected into the $Tnbs_2$ HSU undergoes in-situ biotransformation to benign N_2 gas by anaerobic denitrifying bacteria.**

Table 2.4-16. Building 817-Proximal (817-PRX) mass removed, January 1, 2009 through June 30, 2009.

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	0	0	0	0	NA
	March	NA	4.3	5.2	25	1.3	NA
	April	NA	1.9	3.4	16	0.87	NA
	May	NA	3.3	5.9	27	1.5	NA
	June	NA	3.8	7.1	32	1.9	NA
Total		NA	13	22	99	5.5	NA

Notes:

Nitrate re-injected into the $Tnbs_2$ HSU undergoes in-situ biotransformation to benign N_2 gas by anaerobic denitrifying bacteria.

Table 2.4-17. Building 829-Source (829-SRC) mass removed, January 1, 2009 through June 30, 2009.

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	0	0	NA	NA
	March	NA	0	0	0	NA	NA
	April	NA	0	0	0	NA	NA
	May	NA	0	0	0	NA	NA
	June	NA	0	0	0	NA	NA
Total		NA	0	0	0	NA	NA

Table 2.5-1. Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K1-01C	DMW	$Tnbs_1$		WGMG	AS:THISO	1	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	AS:UISO	1	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E8260	1	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E906	1	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	AS:THISO	2	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	AS:UISO	2	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E8260	2	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	E906	2	Y	
K1-01C	DMW	$Tnbs_1$		WGMG	AS:THISO	3		
K1-01C	DMW	$Tnbs_1$		WGMG	AS:UISO	3		
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K1-01C	DMW	$Tnbs_1$		WGMG	E8260	3		
K1-01C	DMW	$Tnbs_1$		WGMG	E906	3		
K1-01C	DMW	$Tnbs_1$		WGMG	AS:THISO	4		
K1-01C	DMW	$Tnbs_1$		WGMG	AS:UISO	4		
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
K1-01C	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K1-01C	DMW	$Tnbs_1$		WGMG	E8260	4		
K1-01C	DMW	$Tnbs_1$		WGMG	E906	4		
K1-02B	DMW	$Tnbs_0$		WGMG	AS:THISO	1	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	AS:UISO	1	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:NO3	1	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:PERC	1	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E8260	1	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E906	1	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	AS:THISO	2	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	AS:UISO	2	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:NO3	2	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:PERC	2	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E8260	2	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	E906	2	Y	
K1-02B	DMW	$Tnbs_0$		WGMG	AS:THISO	3		
K1-02B	DMW	$Tnbs_0$		WGMG	AS:UISO	3		
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:NO3	3		
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:PERC	3		
K1-02B	DMW	$Tnbs_0$		WGMG	E8260	3		
K1-02B	DMW	$Tnbs_0$		WGMG	E906	3		
K1-02B	DMW	$Tnbs_0$		WGMG	AS:THISO	4		
K1-02B	DMW	$Tnbs_0$		WGMG	AS:UISO	4		
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:NO3	4		
K1-02B	DMW	$Tnbs_0$		WGMG	E300.0:PERC	4		
K1-02B	DMW	$Tnbs_0$		WGMG	E8260	4		

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K1-02B	DMW	$Tnbs_0$		WGMG	E906	4		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:THISO	1	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:UISO	1	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:NO3	1	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:PERC	1	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E8260	1	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E906	1	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:THISO	2	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:UISO	2	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:NO3	2	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:PERC	2	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E8260	2	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E906	2	Y	
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:THISO	3		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:UISO	3		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:NO3	3		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:PERC	3		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E8260	3		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E906	3		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:THISO	4		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	AS:UISO	4		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:NO3	4		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E300.0:PERC	4		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E8260	4		
K1-04	DMW	$Tnbs_1/Tnbs_0$		WGMG	E906	4		
K1-05	DMW	$Tnbs_1$		WGMG	AS:THISO	1	Y	
K1-05	DMW	$Tnbs_1$		WGMG	AS:UISO	1	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E8260	1	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E906	1	Y	
K1-05	DMW	$Tnbs_1$		WGMG	AS:THISO	2	Y	
K1-05	DMW	$Tnbs_1$		WGMG	AS:UISO	2	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E8260	2	Y	
K1-05	DMW	$Tnbs_1$		WGMG	E906	2	Y	
K1-05	DMW	$Tnbs_1$		WGMG	AS:THISO	3		
K1-05	DMW	$Tnbs_1$		WGMG	AS:UISO	3		
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K1-05	DMW	$Tnbs_1$		WGMG	E8260	3		
K1-05	DMW	$Tnbs_1$		WGMG	E906	3		
K1-05	DMW	$Tnbs_1$		WGMG	AS:THISO	4		
K1-05	DMW	$Tnbs_1$		WGMG	AS:UISO	4		
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
K1-05	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K1-05	DMW	$Tnbs_1$		WGMG	E8260	4		
K1-05	DMW	$Tnbs_1$		WGMG	E906	4		
K1-06	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
K1-06	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
K1-06	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K1-06	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
K1-06	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
K1-06	PTMW	$Tnbs_1$		DIS	E300.0:PERC	3		
K1-06	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
K1-06	PTMW	$Tnbs_1$	S	CMP	E906	4		
K1-07	DMW	$Tnbs_1$		WGMG	AS:THISO	1	Y	
K1-07	DMW	$Tnbs_1$		WGMG	AS:UISO	1	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E8260	1	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E906	1	Y	
K1-07	DMW	$Tnbs_1$		WGMG	AS:THISO	2	Y	
K1-07	DMW	$Tnbs_1$		WGMG	AS:UISO	2	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E8260	2	Y	
K1-07	DMW	$Tnbs_1$		WGMG	E906	2	Y	
K1-07	DMW	$Tnbs_1$		DIS	MS:UISO	2	Y	
K1-07	DMW	$Tnbs_1$		WGMG	AS:THISO	3		
K1-07	DMW	$Tnbs_1$		WGMG	AS:UISO	3		
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K1-07	DMW	$Tnbs_1$		WGMG	E8260	3		
K1-07	DMW	$Tnbs_1$		WGMG	E906	3		
K1-07	DMW	$Tnbs_1$		WGMG	AS:THISO	4		
K1-07	DMW	$Tnbs_1$		WGMG	AS:UISO	4		
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
K1-07	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K1-07	DMW	$Tnbs_1$		WGMG	E8260	4		
K1-07	DMW	$Tnbs_1$		WGMG	E906	4		
K1-08	DMW	$Tnbs_1$		WGMG	AS:THISO	1	Y	
K1-08	DMW	$Tnbs_1$		WGMG	AS:UISO	1	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E8260	1	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E906	1	Y	
K1-08	DMW	$Tnbs_1$		WGMG	AS:THISO	2	Y	
K1-08	DMW	$Tnbs_1$		WGMG	AS:UISO	2	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E8260	2	Y	
K1-08	DMW	$Tnbs_1$		WGMG	E906	2	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K1-08	DMW	$Tnbs_1$		WGMG	AS:THISO	3		
K1-08	DMW	$Tnbs_1$		WGMG	AS:UISO	3		
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K1-08	DMW	$Tnbs_1$		WGMG	E8260	3		
K1-08	DMW	$Tnbs_1$		WGMG	E906	3		
K1-08	DMW	$Tnbs_1$		WGMG	AS:THISO	4		
K1-08	DMW	$Tnbs_1$		WGMG	AS:UISO	4		
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
K1-08	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K1-08	DMW	$Tnbs_1$		WGMG	E8260	4		
K1-08	DMW	$Tnbs_1$		WGMG	E906	4		
K1-09	DMW	$Tnbs_1$		WGMG	AS:THISO	1	Y	
K1-09	DMW	$Tnbs_1$		WGMG	AS:UISO	1	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	1	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	1	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E8260	1	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E906	1	Y	
K1-09	DMW	$Tnbs_1$		WGMG	AS:THISO	2	Y	
K1-09	DMW	$Tnbs_1$		WGMG	AS:UISO	2	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	2	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E8260	2	Y	
K1-09	DMW	$Tnbs_1$		WGMG	E906	2	Y	
K1-09	DMW	$Tnbs_1$		WGMG	AS:THISO	3		
K1-09	DMW	$Tnbs_1$		WGMG	AS:UISO	3		
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	3		
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K1-09	DMW	$Tnbs_1$		WGMG	E8260	3		
K1-09	DMW	$Tnbs_1$		WGMG	E906	3		
K1-09	DMW	$Tnbs_1$		WGMG	AS:THISO	4		
K1-09	DMW	$Tnbs_1$		WGMG	AS:UISO	4		
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
K1-09	DMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K1-09	DMW	$Tnbs_1$		WGMG	E8260	4		
K1-09	DMW	$Tnbs_1$		WGMG	E906	4		
K2-03	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
K2-03	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K2-03	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
K2-03	PTMW	$Tnbs_1$	S	CMP	E906	4		
K2-04D*	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
K2-04D*	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K2-04D*	PTMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K2-04D*	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
K2-04D*	PTMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K2-04D*	PTMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K2-04D*	PTMW	$Tnbs_1$	S	CMP	E906	4		

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K2-04S*	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
K2-04S*	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K2-04S*	PTMW	$Tnbs_1$		WGMG	E300.0:PERC	2	Y	
K2-04S*	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
K2-04S*	PTMW	$Tnbs_1$		WGMG	E300.0:PERC	3		
K2-04S*	PTMW	$Tnbs_1$		WGMG	E300.0:PERC	4		
K2-04S*	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-05	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-05	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-05	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-05	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-05	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-05A	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-05A	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-05A	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-05A	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-05A	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-06	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-06	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-06	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-06	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-06	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-06A	PTMW	$Tnbs_1$		DIS	AS:UISO	2	Y	
NC2-06A	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-06A	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-06A	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-06A	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	Y	
NC2-06A	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-06A	PTMW	$Tnbs_1$		DIS	MS:UISO	4		
NC2-09	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-09	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-09	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-09	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-09	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-10	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-10	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-10	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-10	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-10	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-11D*	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-11D*	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-11D*	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-11D*	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	Y	
NC2-11D*	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-11D*	PTMW	$Tnbs_1$		DIS	MS:UISO	4		
NC2-11I	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-11I	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
NC2-11I	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-11I	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-11I	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC2-11I	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-11S	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-11S	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-11S	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-11S	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-11S	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC2-11S	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-12D*	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-12D*	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-12D*	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-12D*	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-12D*	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-12D*	PTMW	$Tnbs_1$		DIS	MS:UISO	4		
NC2-12I	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-12I	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-12I	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-12I	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-12I	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC2-12I	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-12S	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-12S	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-12S	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-12S	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-12S	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC2-12S	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-13	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC2-13	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-13	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-13	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-13	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-14S	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC2-14S	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-14S	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-14S	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-14S	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-15	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-15	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-15	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-15	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-15	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-16	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC2-16	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-16	PTMW	$Tnbs_1$	S	CMP	E300.0:NO3	2	Y	
NC2-16	PTMW	$Tnbs_1$	A	CMP	E906	2	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
NC2-16	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-17	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-17	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-17	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-17	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-17	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-18	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-18	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-18	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-18	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-18	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-19	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-19	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-19	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-19	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-19	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC2-20	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	Y	
NC2-20	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
NC2-20	PTMW	$Tnbs_0$		DIS	E300.0:PERC	2	Y	
NC2-20	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
NC2-20	PTMW	$Tnbs_0$	S	CMP	E906	4		
NC2-21	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC2-21	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-21	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC2-21	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC2-21	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-10	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-10	PTMW	$Tnbs_1$		DIS	AS:UISO	2	Y	
NC7-10	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-10	PTMW	$Tnbs_1$		DIS	E8330	2	Y	
NC7-10	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-10	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	Y	
NC7-10	PTMW	$Tnbs_1$		WGMG	E300.0:NO3	4		
NC7-10	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-11	PTMW	$Qal/Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-11	PTMW	$Qal/Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-11	PTMW	$Qal/Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-11	PTMW	$Qal/Tnbs_1$		DIS	E8330	2	Y	
NC7-11	PTMW	$Qal/Tnbs_1$	S	CMP	E906	2	Y	
NC7-11	PTMW	$Qal/Tnbs_1$	S	CMP	E906	4		
NC7-14	PTMW	$Qal/Tnbs_1$	A	CMP	AS:UISO	2	N	Dry.
NC7-14	PTMW	$Qal/Tnbs_1$	A	CMP	E300.0:NO3	2	N	Dry.
NC7-14	PTMW	$Qal/Tnbs_1$		DIS	E300.0:PERC	2	N	Dry.
NC7-14	PTMW	$Qal/Tnbs_1$	S	CMP	E906	2	N	Dry.
NC7-14	PTMW	$Qal/Tnbs_1$	S	CMP	E906	4		
NC7-15	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-15	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
NC7-15	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-15	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-15	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-19	PTMW	$Qal/Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-19	PTMW	$Qal/Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-19	PTMW	$Qal/Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-19	PTMW	$Qal/Tnbs_1$		DIS	E8330	2	Y	
NC7-19	PTMW	$Qal/Tnbs_1$	S	CMP	E906	2	Y	
NC7-19	PTMW	$Qal/Tnbs_1$	S	CMP	E906	4		
NC7-27	PTMW	$Tnsc_0$	A	CMP	AS:UISO	2	Y	
NC7-27	PTMW	$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
NC7-27	PTMW	$Tnsc_0$		DIS	E300.0:PERC	2	Y	
NC7-27	PTMW	$Tnsc_0$		DIS	E8330	2	Y	
NC7-27	PTMW	$Tnsc_0$	S	CMP	E906	2	Y	
NC7-27	PTMW	$Tnsc_0$	S	CMP	E906	4		
NC7-28	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-28	PTMW	$Tnbs_1$		DIS	MS:UISO	1	Y	
NC7-28	PTMW	$Tnbs_1$		DIS	AS:UISO	2	Y	
NC7-28	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-28	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-28	PTMW	$Tnbs_1$		DIS	E8330	2	Y	
NC7-28	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-28	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	Y	
NC7-28	PTMW	$Tnbs_1$		DIS	E300.0:PERC	3		
NC7-28	PTMW	$Tnbs_1$		DIS	MS:UISO	3		
NC7-28	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC7-28	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-28	PTMW	$Tnbs_1$		DIS	MS:UISO	4		
NC7-29	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-29	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-29	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-29	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-29	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-43	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-43	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-43	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-43	PTMW	$Tnbs_1$		DIS	E8330	2	Y	
NC7-43	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-43	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-44	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-44	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-44	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-44	PTMW	$Tnbs_1$		DIS	E8330	2	Y	
NC7-44	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-44	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-45	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	N	Bent casing. Unable to sample. Replaced with well W-850-2313.

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
NC7-45	PTMW	$Tnbs_1$	S	CMP	E906	2	N	Bent casing. Unable to sample. Replaced with well W-850-2313.
NC7-45	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	N	Bent casing. Unable to sample. Replaced with well W-850-2313.
NC7-45	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-46	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-46	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-46	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-46	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-54	PTMW	Qal	A	CMP	E300.0:NO3	2	Y	
NC7-54	PTMW	Qal		DIS	E8330	2	Y	
NC7-54	PTMW	Qal	S	CMP	E906	2	Y	
NC7-54	PTMW	Qal	A	CMP	MS:UISO	2	Y	
NC7-54	PTMW	Qal	S	CMP	E906	4		
NC7-55	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	N	Dry.
NC7-55	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	N	Dry.
NC7-55	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	N	Dry.
NC7-55	PTMW	$Tnbs_1$	S	CMP	E906	2	N	Dry.
NC7-55	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-56	PTMW	Qal/$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-56	PTMW	Qal/$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-56	PTMW	Qal/$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-56	PTMW	Qal/$Tnbs_1$	S	CMP	E906	2	Y	
NC7-56	PTMW	Qal/$Tnbs_1$	S	CMP	E906	4		
NC7-57	PTMW	Qal		DIS	E300.0:PERC	1	N	Dry.
NC7-57	PTMW	Qal	A	CMP	AS:UISO	2	N	Dry.
NC7-57	PTMW	Qal	A	CMP	E300.0:NO3	2	N	Dry.
NC7-57	PTMW	Qal	S	CMP	E906	2	N	Dry.
NC7-57	PTMW	Qal	S	CMP	E906	4		
NC7-58	PTMW	Qal		DIS	E300.0:PERC	1	Y	
NC7-58	PTMW	Qal	A	CMP	AS:UISO	2	Y	
NC7-58	PTMW	Qal	A	CMP	E300.0:NO3	2	Y	
NC7-58	PTMW	Qal	S	CMP	E906	2	Y	
NC7-58	PTMW	Qal	S	CMP	E906	4		
NC7-59	PTMW	Qal/$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-59	PTMW	Qal/$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-59	PTMW	Qal/$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-59	PTMW	Qal/$Tnbs_1$	S	CMP	E906	2	Y	
NC7-59	PTMW	Qal/$Tnbs_1$	S	CMP	E906	4		
NC7-60	PTMW	$Tnbs_0$		DIS	E300.0:PERC	1	Y	
NC7-60	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	Y	
NC7-60	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
NC7-60	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
NC7-60	PTMW	$Tnbs_0$	S	CMP	E906	4		
NC7-61*	PTMW	$Tnbs_0$		WGMG	E300.0:NO3	1	Y	
NC7-61*	PTMW	$Tnbs_0$		DIS	E300.0:PERC	1	Y	
NC7-61*	PTMW	$Tnbs_0$		DIS	AS:UISO	2	Y	
NC7-61*	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
NC7-61*	PTMW	$Tnbs_0$		WGMG	E300.0:PERC	2	Y	
NC7-61*	PTMW	$Tnbs_0$		DIS	E8330	2	Y	
NC7-61*	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
NC7-61*	PTMW	$Tnbs_0$	A	CMP	MS:UISO	2	Y	
NC7-61*	PTMW	$Tnbs_0$		WGMG	E300.0:PERC	3		
NC7-61*	PTMW	$Tnbs_0$		DIS	MS:UISO	3		
NC7-61*	PTMW	$Tnbs_0$		WGMG	E300.0:NO3	4		
NC7-61*	PTMW	$Tnbs_0$		WGMG	E300.0:PERC	4		
NC7-61*	PTMW	$Tnbs_0$	S	CMP	E906	4		
NC7-61*	PTMW	$Tnbs_0$		DIS	MS:UISO	4		
NC7-62	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-62	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-62	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-62	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-62	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC7-62	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-69*	PTMW	Tmss	A	CMP	AS:UISO	2	Y	
NC7-69*	PTMW	Tmss	A	CMP	E300.0:NO3	2	Y	
NC7-69*	PTMW	Tmss		DIS	E601	2	Y	
NC7-69*	PTMW	Tmss		DIS	E601	2	Y	
NC7-69*	PTMW	Tmss		DIS	E8330	2	Y	
NC7-69*	PTMW	Tmss	S	CMP	E906	2	Y	
NC7-69*	PTMW	Tmss		DIS	E601	4		
NC7-69*	PTMW	Tmss	S	CMP	E906	4		
NC7-70	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-70	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-70	PTMW	$Tnbs_1$		DIS	E8330	2	Y	
NC7-70	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-70	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	Y	
NC7-70	PTMW	$Tnbs_1$		DIS	E300.0:PERC	3		
NC7-70	PTMW	$Tnbs_1$		DIS	MS:UISO	3		
NC7-70	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-70	PTMW	$Tnbs_1$		DIS	MS:UISO	4		
NC7-71	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-71	PTMW	$Tnbs_1$		DIS	MS:UISO	1	Y	
NC7-71	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-71	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-71	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-71	PTMW	$Tnbs_1$		DIS	E8330	2	Y	
NC7-71	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-71	PTMW	$Tnbs_1$		DIS	E300.0:PERC	3		
NC7-71	PTMW	$Tnbs_1$		DIS	MS:UISO	3		
NC7-71	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC7-71	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-72	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC7-72	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-72	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-72	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-72	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-73	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-73	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-73	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
NC7-73	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-73	PTMW	$Tnbs_1$		DIS	E300.0:PERC	4		
NC7-73	PTMW	$Tnbs_1$	S	CMP	E906	4		
NC7-76	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
NC7-76	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC7-76	PTMW	$Tnbs_1$		DIS	E300.0:PERC	2	Y	
NC7-76	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
NC7-76	PTMW	$Tnbs_1$	S	CMP	E906	4		
SPRING24	SPR	$Tnbs_0/Tnbs_1$	A	CMP	AS:UISO	2	N	Dry.
SPRING24	SPR	$Tnbs_0/Tnbs_1$	A	CMP	E300.0:NO3	2	N	Dry.
SPRING24	SPR	$Tnbs_0/Tnbs_1$		DIS	E300.0:PERC	2	N	Dry.
SPRING24	SPR	$Tnbs_0/Tnbs_1$	S	CMP	E906	2	N	Dry.
SPRING24	SPR	$Tnbs_0/Tnbs_1$	S	CMP	E906	4		
W-850-05	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
W-850-05	PTMW	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
W-850-05	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-850-05	PTMW	$Tnbs_1$	S	CMP	E906	2	Y	
W-850-05	PTMW	$Tnbs_1$	S	CMP	E906	4		
W-850-05	PTMW	$Tnbs_1$		DIS	MS:UISO	4		
W-850-2145	PTMW	$Tnbs_1/Tnbs_0$	A	CMP	AS:UISO	2	Y	
W-850-2145	PTMW	$Tnbs_1/Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
W-850-2145	PTMW	$Tnbs_1/Tnbs_0$		DIS	E300.0:PERC	2	Y	
W-850-2145	PTMW	$Tnbs_1/Tnbs_0$	S	CMP	E906	2	Y	
W-850-2145	PTMW	$Tnbs_1/Tnbs_0$	S	CMP	E906	4		
W-850-2312	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	Y	
W-850-2312	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
W-850-2312	PTMW	$Tnbs_0$	A	CMP	E300.0:PERC	2	Y	
W-850-2312	PTMW	$Tnbs_0$		DIS	E8330	2	Y	
W-850-2312	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
W-850-2312	PTMW	$Tnbs_0$	S	CMP	E906	4		
W-850-2312	PTMW	$Tnbs_0$		DIS	MS:UISO	4		
W-850-2313	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
W-850-2313	PTMW	$Tnbs_0$	A	CMP	E300.0:PERC	2	Y	
W-850-2313	PTMW	$Tnbs_0$		DIS	E8330	2	Y	
W-850-2313	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
W-850-2313	PTMW	$Tnbs_0$	A	CMP	MS:UISO	2	Y	
W-850-2313	PTMW	$Tnbs_0$		DIS	E300.0:NO3	4		
W-850-2313	PTMW	$Tnbs_0$		DIS	E300.0:PERC	4		
W-850-2313	PTMW	$Tnbs_0$	S	CMP	E906	4		
W-850-2314	PTMW	$Tnbs_0$		DIS	E906	1	Y	
W-850-2314	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	Y	
W-850-2314	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
W-850-2314	PTMW	$Tnbs_0$	A	CMP	E300.0:PERC	2	Y	
W-850-2314	PTMW	$Tnbs_0$		DIS	E8330	2	Y	
W-850-2314	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
W-850-2314	PTMW	$Tnbs_0$	S	CMP	E906	4		
W-850-2315	PTMW	$Tnbs_0$		DIS	E300.0:NO3	1	Y	

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-850-2315	PTMW	$Tnbs_0$		DIS	E906	1	Y	
W-850-2315	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	Y	
W-850-2315	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
W-850-2315	PTMW	$Tnbs_0$	A	CMP	E300.0:PERC	2	Y	
W-850-2315	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
W-850-2315	PTMW	$Tnbs_0$	S	CMP	E906	4		
W-850-2316	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	Y	
W-850-2316	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	2	Y	
W-850-2316	PTMW	$Tnbs_0$	A	CMP	E300.0:PERC	2	Y	
W-850-2316	PTMW	$Tnbs_0$	S	CMP	E906	2	Y	
W-850-2316	PTMW	$Tnbs_0$	S	CMP	E906	4		
W-850-2416	PTMW	$Tnbs_0$	A	CMP	E300.0:NO3	1	Y	
W-850-2416	PTMW	$Tnbs_0$	A	CMP	AS:UISO	2	N	No access due to the soil removal project.
W-850-2416	PTMW	$Tnbs_0$	A	CMP	E300.0:PERC	2	N	No access due to the soil removal project.
W-850-2416	PTMW	$Tnbs_0$	S	CMP	E906	2	N	No access due to the soil removal project.
W-850-2416	PTMW	$Tnbs_0$	S	CMP	E906	4		
W-850-2417	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	1	N	No access due to the soil removal project.
W-850-2417	PTMW	$Tnbs_1$	S	CMP	E906	2	N	No access due to the soil removal project.
W-850-2417	PTMW	$Tnbs_1$	A	CMP	MS:UISO	2	N	No access due to the soil removal project.
W-850-2417	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	4		
W-850-2417	PTMW	$Tnbs_1$	S	CMP	E906	4		
W-865-1802	PTMW	$Tnbs_0$-$Tnsc_0$	A	CMP	AS:UISO	2	Y	
W-865-1802	PTMW	$Tnbs_0$-$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-865-1802	PTMW	$Tnbs_0$-$Tnsc_0$	S	CMP	E906	2	Y	
W-865-1802	PTMW	$Tnbs_0$-$Tnsc_0$	S	CMP	E906	4		
W-865-1803	PTMW	$Tnbs_0$-$Tnsc_0$	A	CMP	AS:UISO	2	Y	
W-865-1803	PTMW	$Tnbs_0$-$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-865-1803	PTMW	$Tnbs_0$-$Tnsc_0$		DIS	E300.0:PERC	2	Y	
W-865-1803	PTMW	$Tnbs_0$-$Tnsc_0$	S	CMP	E906	2	Y	
W-865-1803	PTMW	$Tnbs_0$-$Tnsc_0$		DIS	E300.0:PERC	4		
W-865-1803	PTMW	$Tnbs_0$-$Tnsc_0$	S	CMP	E906	4		
W-PIT1-02*	PTMW	$Tnbs_1$		DIS	DWMETALS	1	N	Inoperable pump.
W-PIT1-02*	PTMW	$Tnbs_1$		DIS	E300.0:NO3	1	N	Inoperable pump.
W-PIT1-02*	PTMW	$Tnbs_1$		DIS	E300.0:PERC	1	N	Inoperable pump.
W-PIT1-02*	PTMW	$Tnbs_1$		DIS	E601	1	N	Inoperable pump.
W-PIT1-02*	PTMW	$Tnbs_1$		DIS	E906	1	N	Inoperable pump.
W-PIT1-2204	PTMW	Qal/$Tnbs_1$-cong		DIS	E300.0:PERC	1	Y	
W-PIT1-2204	PTMW	Qal/$Tnbs_1$-cong		DIS	E906	1	Y	
W-PIT1-2204	PTMW	Qal/$Tnbs_1$-cong		DIS	MS:UISO	1	Y	
W-PIT1-2204	PTMW	Qal/$Tnbs_1$-cong	A	CMP	AS:UISO	2	N	Insufficient water.

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-PIT1-2204	PTMW	Qal/Tnbs$_1$-cong	A	CMP	E300.0:NO3	2	N	Insufficient water.
W-PIT1-2204	PTMW	Qal/Tnbs$_1$-cong	A	CMP	E300.0:PERC	2	N	Insufficient water.
W-PIT1-2204	PTMW	Qal/Tnbs$_1$-cong	S	CMP	E906	2	N	Insufficient water.
W-PIT1-2204	PTMW	Qal/Tnbs$_1$-cong	S	CMP	E906	4		
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E300.0:NO3	1	Y	
W-PIT1-2209	PTMW	Tnbs$_1$	A	CMP	E300.0:PERC	1	Y	
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E601	1	Y	
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E906	1	Y	
W-PIT1-2209	PTMW	Tnbs$_1$	A	CMP	AS:UISO	2	Y	
W-PIT1-2209	PTMW	Tnbs$_1$	A	CMP	E300.0:NO3	2	Y	
W-PIT1-2209	PTMW	Tnbs$_1$	S	CMP	E906	2	Y	
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E300.0:NO3	3		
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E300.0:PERC	3		
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E601	3		
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	E906	3		
W-PIT1-2209	PTMW	Tnbs$_1$	S	CMP	E906	4		
W-PIT1-2209	PTMW	Tnbs$_1$		DIS	MS:UISO	4		
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$		DIS	E300.0:PERC	1	Y	
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	Q	CMP	E906	1	Y	
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	A	CMP	AS:UISO	2	Y	
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	A	CMP	E300.0:NO3	2	Y	
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	A	CMP	E300.0:PERC	2	Y	
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	Q	CMP	E906	2	Y	
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$		DIS	E300.0:PERC	3		
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	Q	CMP	E906	3		
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$		DIS	E300.0:PERC	4		
W-PIT1-2225	GW	Tnbs$_1$/Tnbs$_0$	Q	CMP	E906	4		
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	AS:THISO	1	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	AS:UISO	1	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E300.0:NO3	1	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E300.0:PERC	1	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E8260	1	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E906	1	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	AS:THISO	2	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	AS:UISO	2	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E300.0:NO3	2	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E300.0:PERC	2	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E8260	2	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	E906	2	Y	
W-PIT1-2326	DMW	Tnbs$_1$/Tnbs$_0$		WGMG	MS:UISO	2	Y	
W-PIT7-16	PTMW	Tnsc$_0$	A	CMP	AS:UISO	2	Y	
W-PIT7-16	PTMW	Tnsc$_0$	A	CMP	E300.0:NO3	2	Y	
W-PIT7-16	PTMW	Tnsc$_0$	S	CMP	E906	2	Y	
W-PIT7-16	PTMW	Tnsc$_0$	S	CMP	E906	4		

Table 2.5-1 (Cont.). Building 850 Area of OU 5 ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W8SPRNG	SPR	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
W8SPRNG	SPR	$Tnbs_1$	A	CMP	AS:UISO	2	Y	
W8SPRNG	SPR	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W8SPRNG	SPR	$Tnbs_1$		DIS	E8330	2	Y	
W8SPRNG	SPR	$Tnbs_1$	S	CMP	E906	2	Y	
W8SPRNG	SPR	$Tnbs_1$	S	CMP	E906	4		

Notes:

K1-01C, K1-02B, K1-04, K1-05, K1-07, K1-08, K1-09, and W-PIT1-2326 are Pit 1 Landfill detection monitoring wells. Analytes and sampling frequency are specified in Waste Discharge Requirements for the Pit 1 Landfill (not included in this CMR).

***Well sampled as part of the surveillance monitoring performed by the Water Guidance and Monitoring Group (WGMG) for additional constiutents and the results are reported in the LLNL Site Annual Environmental Report.**

Building 850 primary COC: tritium (E906).
Building 850 secondary COC: nitrate (E300.0:NO3).
Building 850 secondary COC: perchlorate (E300.0:PERC) for select wells.
Building 850 secondary COC: uranium (MS:UISO).
Contaminants of Concern in the Vadose Zone not detected in Ground Water: PCBs.

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

Table 2.6-1. Building 854-Source (854-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
854-SRC	January	475	683	1,326	78,014
	February	580	743	1,630	82,788
	March	788	743	2,211	93,269
	April	628	577	1,758	69,313
	May	588	653	1,633	71,992
	June	594	816	1,648	87,961
Total		3,653	4,215	10,206	483,337

Table 2.6-2. Building 854-Proximal (854-PRX) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
854-PRX	January	NA	193	NA	17,417
	February	NA	694	NA	62,393
	March	NA	769	NA	68,682
	April	NA	628	NA	55,644
	May	NA	653	NA	57,707
	June	NA	524	NA	45,733
Total		NA	3,461	NA	307,576

Table 2.6-3. Building 854-Distal (854-DIS) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
854-DIS	January	NA	0	NA	0
	February	NA	4	NA	204
	March	NA	20	NA	1,095
	April	NA	15	NA	882
	May	NA	14	NA	798
	June	NA	14	NA	790
Total		NA	67	NA	3,769

Table 2.6-4. Building 854 OU VOCs in ground water 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-GWTS-E	2/24/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/7/09	<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-GWTS-E	5/4/09	<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-GWTS-E	6/8/09	<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-GWTS-I	2/24/09	48	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-DIS-GWTS-I	4/7/09	26	<0.5	0.52	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
854-DIS-GWTS-I	4/7/09 DUP	26	<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
Building 854-Proximal															
854-PRX-GWTS-E	1/29/09	<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-GWTS-E	2/3/09	<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-GWTS-E	3/3/09	<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-GWTS-E	4/6/09	<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-GWTS-E	5/4/09	<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-GWTS-E	6/8/09	<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-GWTS-I	2/3/09	29	<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-GWTS-I	4/6/09	34	<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-GWTS-I	4/6/09 DUP	34	<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															
854-SRC-GWTS-E	1/12/09	<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-SRC-GWTS-E	2/3/09	<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-SRC-GWTS-E	3/3/09	<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-SRC-GWTS-E	4/6/09	<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-SRC-GWTS-E	5/4/09	<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-SRC-GWTS-E	6/8/09	<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-SRC-GWTS-I	1/12/09	63	<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-SRC-GWTS-I	4/6/09	71	<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 2.6-4. Building 854 OU VOCs in ground water 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)
854-SRC-GWTS-I	4/6/09 DUP	72	<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 in January due to freeze protection shutdown.**

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

Table 2.6-4 (Cont.). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 854-Distal [a]		
854-DIS-GWTS-E	**2/24/09**	**0 of 18**
854-DIS-GWTS-E	**3/3/09**	**0 of 18**
854-DIS-GWTS-E	**4/7/09**	**0 of 18**
854-DIS-GWTS-E	**5/4/09**	**0 of 18**
854-DIS-GWTS-E	**6/8/09**	**0 of 18**
854-DIS-GWTS-I	**2/24/09**	**0 of 18**
854-DIS-GWTS-I	**4/7/09**	**0 of 18**
854-DIS-GWTS-I	**4/7/09 DUP**	**0 of 18**
Building 854-Proximal		
854-PRX-GWTS-E	**1/29/09**	**0 of 18**
854-PRX-GWTS-E	**2/3/09**	**0 of 18**
854-PRX-GWTS-E	**3/3/09**	**0 of 18**
854-PRX-GWTS-E	**4/6/09**	**0 of 18**
854-PRX-GWTS-E	**5/4/09**	**0 of 18**
854-PRX-GWTS-E	**6/8/09**	**0 of 18**
854-PRX-GWTS-I	**2/3/09**	**0 of 18**
854-PRX-GWTS-I	**4/6/09**	**0 of 18**
854-PRX-GWTS-I	**4/6/09 DUP**	**0 of 18**
Building 854-Source		
854-SRC-GWTS-E	**1/12/09**	**0 of 18**
854-SRC-GWTS-E	**2/3/09**	**0 of 18**
854-SRC-GWTS-E	**3/3/09**	**0 of 18**
854-SRC-GWTS-E	**4/6/09**	**0 of 18**
854-SRC-GWTS-E	**5/4/09**	**0 of 18**
854-SRC-GWTS-E	**6/8/09**	**0 of 18**
854-SRC-GWTS-I	**1/12/09**	**0 of 18**
854-SRC-GWTS-I	**4/6/09**	**0 of 18**
854-SRC-GWTS-I	**4/6/09 DUP**	**0 of 18**

Notes:

[a] **No samples collected in January due to freeze protection shutdown.**

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

Table 2.6-5. Building 854 OU nitrate and perchlorate in ground water treatment system influent and effluent.

Location	Date	Nitrate (as NO3) (mg/L)	Perchlorate (μg/L)
Building 854-Distal[a]			
854-DIS-GWTS-E	2/24/09	1.8	<4
854-DIS-GWTS-E	3/3/09	1.3	<4
854-DIS-GWTS-E	4/7/09	6.8	<4
854-DIS-GWTS-E	5/4/09	7.5	<4
854-DIS-GWTS-E	6/8/09	7.7	<4
854-DIS-GWTS-E[b]	6/16/09	8.9	-
854-DIS-GWTS-E[b]	6/24/09	9.2	-
854-DIS-GWTS-I	2/24/09	25	4.8
854-DIS-GWTS-I	4/7/09	24	5.3
854-DIS-GWTS-I	04/07/09 DUP	25	4.5
Building 854-Proximal			
854-PRX-GWTS-E	1/29/09	1.8	<4
854-PRX-GWTS-E	2/3/09	1.2	<4
854-PRX-GWTS-E	3/3/09	<0.5	<4
854-PRX-GWTS-E	4/6/09	1.1	<4
854-PRX-GWTS-E	5/4/09	0.73	<4
854-PRX-GWTS-E	6/8/09	17	<4
854-PRX-GWTS-I	2/3/09	45	11
854-PRX-GWTS-I	4/6/09	47	13
854-PRX-GWTS-I	04/06/09 DUP	47	10
Building 854-Source			
854-SRC-GWTS-E	1/12/09	50	<4
854-SRC-GWTS-E	2/3/09	46	<4
854-SRC-GWTS-E	3/3/09	45	<4
854-SRC-GWTS-E	4/6/09	47	<4
854-SRC-GWTS-E	5/4/09	46	<4
854-SRC-GWTS-E	6/8/09	45	<4
854-SRC-GWTS-I	1/12/09	47	<4
854-SRC-GWTS-I	4/6/09	48	<4
854-SRC-GWTS-I	04/06/09 DUP	48	<4

Notes:

[a] **No samples collected in January due to freeze protection shutdown.**

[b] **Additional nitrate samples collected due to erroneous effluent data reported on June 8.**

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

Table 2.6-6. Building 854 OU treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
854-SRC GWTS			
Influent Port	854-SRC-I	VOCs	Quarterly
		Perchlorate	Quarterly
		Nitrate	Quarterly
		pH	Quarterly
Effluent Port	854-SRC-E	VOCs	Monthly
		Perchlorate	Monthly
		Nitrate	Monthly
		pH	Monthly
854-SRC SVTS			
Influent Port	W-854-1834-854-SRC-VI	No Monitoring Requirements	
Effluent Port	854-SRC-E	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-BTU-I	VOCs	Monthly
Effluent Port	854-PRX-E	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:

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

[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.

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

Table 2.6-7. Building 854 OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
SPRING10	SPR	Qls	Q	CMP	E601	1	Y	
SPRING10	SPR	Qls	Q	CMP	E601	2	N	Dry.
SPRING10	SPR	Qls	Q	CMP	E601	3		
SPRING10	SPR	Qls	Q	CMP	E601	4		
SPRING10	SPR	Qls	A	CMP	E300.0:NO3	2	N	Dry.
SPRING10	SPR	Qls	A	CMP	E300.0:PERC	2	N	Dry.
SPRING11	SPR	Qls-$Tnbs_1$	Q	CMP	E601	1	Y	
SPRING11	SPR	Qls-$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
SPRING11	SPR	Qls-$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
SPRING11	SPR	Qls-$Tnbs_1$	Q	CMP	E601	2	Y	
SPRING11	SPR	Qls-$Tnbs_1$	Q	CMP	E601	3		
SPRING11	SPR	Qls-$Tnbs_1$	Q	CMP	E601	4		
W-854-01	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-01	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-01	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-854-01	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-854-02	EW	$Tnbs_1$		DIS	E300.0:NO3	1	Y	854-SRC extraction well.
W-854-02	EW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	854-SRC extraction well.
W-854-02	EW	$Tnbs_1$		DIS	E601	1	Y	854-SRC extraction well.
W-854-02	EW	$Tnbs_1$	A	CMP-TF	E300.0:NO3	2	Y	854-SRC extraction well.
W-854-02	EW	$Tnbs_1$	A	CMP-TF	E300.0:PERC	2	Y	854-SRC extraction well.
W-854-02	EW	$Tnbs_1$	S	CMP-TF	E601	2	Y	854-SRC extraction well.
W-854-02	EW	$Tnbs_1$	S	CMP-TF	E601	4		854-SRC extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E300.0:NO3	1	Y	854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E601	1	Y	854-PRX extraction well.
W-854-03	EW	$Tnbs_1$	A	CMP-TF	E300.0:NO3	2	Y	854-PRX extraction well.
W-854-03	EW	$Tnbs_1$	A	CMP-TF	E300.0:PERC	2	Y	854-PRX extraction well.
W-854-03	EW	$Tnbs_1$	S	CMP-TF	E601	2	Y	854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E300.0:NO3	3		854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E300.0:PERC	3		854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E601	3		854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E300.0:NO3	4		854-PRX extraction well.
W-854-03	EW	$Tnbs_1$		DIS	E300.0:PERC	4		854-PRX extraction well.
W-854-03	EW	$Tnbs_1$	S	CMP-TF	E601	4		854-PRX extraction well.
W-854-04	PTMW	Tmss	A	CMP	E300.0:NO3	2	Y	
W-854-04	PTMW	Tmss	A	CMP	E300.0:PERC	2	Y	
W-854-04	PTMW	Tmss	S	CMP	E601	2	Y	
W-854-04	PTMW	Tmss	S	CMP	E601	4		
W-854-05	PTMW	Qls-$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-05	PTMW	Qls-$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-05	PTMW	Qls-$Tnbs_1$	S	CMP	E601	2	Y	
W-854-05	PTMW	Qls-$Tnbs_1$	S	CMP	E601	4		
W-854-06	PTMW	$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-854-06	PTMW	$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-06	PTMW	$Tnsc_0$	S	CMP	E601	2	Y	
W-854-06	PTMW	$Tnsc_0$	S	CMP	E601	4		
W-854-07	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-07	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-07	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-854-07	PTMW	$Tnbs_1$	S	CMP	E601	4		

Table 2.6-7 (Cont.). Building 854 OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-854-08	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-08	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-08	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-854-08	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-854-09	PTMW	$Tnsbs_0$	A	CMP	E300.0:NO3	2	Y	
W-854-09	PTMW	$Tnsbs_0$	A	CMP	E300.0:PERC	2	Y	
W-854-09	PTMW	$Tnsbs_0$	S	CMP	E601	2	Y	
W-854-09	PTMW	$Tnsbs_0$	S	CMP	E601	4		
W-854-10	PTMW	$Tnsbs_0$	A	CMP	E300.0:NO3	2	Y	
W-854-10	PTMW	$Tnsbs_0$	A	CMP	E300.0:PERC	2	Y	
W-854-10	PTMW	$Tnsbs_0$	S	CMP	E601	2	Y	
W-854-10	PTMW	$Tnsbs_0$	S	CMP	E601	4		
W-854-11	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	N	Dry.
W-854-11	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	N	Dry.
W-854-11	PTMW	$Tnbs_1$	S	CMP	E601	2	N	Dry.
W-854-11	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-854-12	PTMW	Tmss	B	CMP	E300.0:NO3	2	NA	Next sample required 2ndQ 2010.
W-854-12	PTMW	Tmss	B	CMP	E300.0:PERC	2	NA	Next sample required 2ndQ 2010.
W-854-12	PTMW	Tmss	B	CMP	E601	2	NA	Next sample required 2ndQ 2010.
W-854-13	PTMW	$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-854-13	PTMW	$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-13	PTMW	$Tnsc_0$	S	CMP	E601	2	Y	
W-854-13	PTMW	$Tnsc_0$	B	CMP	E8082A	2	Y	Next sample required 2ndQ 2011.
W-854-13	PTMW	$Tnsc_0$	S	CMP	E601	4		
W-854-14	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-14	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-14	PTMW	$Tnbs_1$	A	CMP	E601	2	Y	
W-854-15	PTMW	Qls	A	CMP	E300.0:NO3	2	Y	
W-854-15	PTMW	Qls	A	CMP	E300.0:PERC	2	Y	
W-854-15	PTMW	Qls	S	CMP	E601	2	Y	
W-854-15	PTMW	Qls	S	CMP	E601	4		
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$		DIS	E300.0:NO3	1	Y	854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$		DIS	E300.0:PERC	1	Y	854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$		DIS	E601	1	Y	854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$	A	CMP-TF	E300.0:NO3	2	Y	854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$	A	CMP-TF	E300.0:PERC	2	Y	854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$	S	CMP-TF	E601	2	Y	854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$		DIS	E300.0:NO3	4		854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$		DIS	E300.0:PERC	4		854-SRC extraction well.
W-854-17	EW	$Tnsbs_0$-$Tnsc_0$	S	CMP-TF	E601	4		854-SRC extraction well.
W-854-1701	PTMW	$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-854-1701	PTMW	$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-1701	PTMW	$Tnsc_0$	S	CMP	E601	2	Y	
W-854-1701	PTMW	$Tnsc_0$	S	CMP	E601	4		
W-854-1706	PTMW	Qal-$Tnbs_1$	A	CMP	E300.0:NO3	2	N	Dry.
W-854-1706	PTMW	Qal-$Tnbs_1$	A	CMP	E300.0:PERC	2	N	Dry.
W-854-1706	PTMW	Qal-$Tnbs_1$	A	CMP	E601	2	N	Dry.
W-854-1707	PTMW	$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	

Table 2.6-7 (Cont.). Building 854 OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-854-1707	PTMW	$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-1707	PTMW	$Tnsc_0$	S	CMP	E601	2	Y	
W-854-1707	PTMW	$Tnsc_0$	S	CMP	E601	4		
W-854-1731	PTMW	Tmss	A	CMP	E300.0:NO3	2	Y	
W-854-1731	PTMW	Tmss	A	CMP	E300.0:PERC	2	Y	
W-854-1731	PTMW	Tmss	S	CMP	E601	2	Y	
W-854-1731	PTMW	Tmss	S	CMP	E601	4		
W-854-1822	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-1822	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-1822	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-854-1822	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-854-1823	PTMW	$Tnsbs_1$-$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-854-1823	PTMW	$Tnsbs_1$-$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-1823	PTMW	$Tnsbs_1$-$Tnsc_0$	S	CMP	E601	2	Y	
W-854-1823	PTMW	$Tnsbs_1$-$Tnsc_0$	S	CMP	E601	4		
W-854-18A	EW	$Tnbs_1$		DIS	E300.0:NO3	1	Y	854-SRC extraction well.
W-854-18A	EW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	854-SRC extraction well.
W-854-18A	EW	$Tnbs_1$		DIS	E601	1	Y	854-SRC extraction well.
W-854-18A	EW	$Tnbs_1$	A	CMP-TF	E300.0:NO3	2	Y	854-SRC extraction well.
W-854-18A	EW	$Tnbs_1$	A	CMP-TF	E300.0:PERC	2	Y	854-SRC extraction well.
W-854-18A	EW	$Tnbs_1$	S	CMP-TF	E601	2	Y	854-SRC extraction well.
W-854-18A	EW	$Tnbs_1$	S	CMP-TF	E601	4		854-SRC extraction well.
W-854-19	PTMW	Qls	A	CMP	E300.0:NO3	2	N	Dry.
W-854-19	PTMW	Qls	A	CMP	E300.0:PERC	2	N	Dry.
W-854-19	PTMW	Qls	A	CMP	E601	2	N	Dry.
W-854-1902	PTMW	$Tnsbs_1$-$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-854-1902	PTMW	$Tnsbs_1$-$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-1902	PTMW	$Tnsbs_1$-$Tnsc_0$	S	CMP	E601	2	Y	
W-854-1902	PTMW	$Tnsbs_1$-$Tnsc_0$	S	CMP	E601	4		
W-854-2115	PTMW	$Tnsbs_1$-$Tnsc_0$		DIS	TBOS	1	Y	
W-854-2115	PTMW	$Tnsbs_1$-$Tnsc_0$	A	CMP	E300.0:NO3	2	Y	
W-854-2115	PTMW	$Tnsbs_1$-$Tnsc_0$	A	CMP	E300.0:PERC	2	Y	
W-854-2115	PTMW	$Tnsbs_1$-$Tnsc_0$	S	CMP	E601	2	Y	
W-854-2115	PTMW	$Tnsbs_1$-$Tnsc_0$	S	CMP	E601	4		
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E300.0:NO3	1	Y	854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E300.0:PERC	1	Y	854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E601	1	Y	854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$	A	CMP-TF	E300.0:NO3	2	Y	854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$	A	CMP-TF	E300.0:PERC	2	Y	854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$	S	CMP-TF	E601	2	Y	854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E300.0:NO3	3		854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E300.0:PERC	3		854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E601	3		854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E300.0:NO3	4		854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$		DIS	E300.0:PERC	4		854-DIS extraction well.
W-854-2139	EW	$Tnsbs_1$-$Tnsc_0$	S	CMP-TF	E601	4		854-DIS extraction well.
W-854-2218	EW	$Tnbs_1$		DIS	E300.0:NO3	1	Y	854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$		DIS	E601	1	Y	854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$	A	CMP-TF	E300.0:NO3	2	Y	854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$	A	CMP-TF	E300.0:PERC	2	Y	854-SRC extraction well.

Table 2.6-7 (Cont.). Building 854 OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-854-2218	EW	$Tnbs_1$	S	CMP-TF	E601	2	Y	854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$		DIS	E300.0:NO3	4		854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$		DIS	E300.0:PERC	4		854-SRC extraction well.
W-854-2218	EW	$Tnbs_1$	S	CMP-TF	E601	4		854-SRC extraction well.
W-854-45	PTMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-854-45	PTMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-854-45	PTMW	$Tnbs_1$	S	CMP	E601	2	Y	
W-854-45	PTMW	$Tnbs_1$	S	CMP	E601	4		
W-854-F2	PTMW	Qls-$Tnbs_1$	B	CMP	E300.0:NO3	2	N	Dry.
W-854-F2	PTMW	Qls-$Tnbs_1$	B	CMP	E300.0:PERC	2	N	Dry.
W-854-F2	PTMW	Qls-$Tnbs_1$	B	CMP	E601	2	N	Dry.

Notes:
Building 854 primary Contaminants of Concern in Ground Water: VOCs (E601 or E624).
Building 854 secondary COC: nitrate (E300:NO3).
Building 854 secondary COC: perchlorate (E300.0:PERC).
Contaminants of Concern in the Vadose Zone not detected in Ground Water: PCBs.
See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.6-8. Building 854-Source (854-SRC) mass removed, January 1, 2009 through June 30, 2009.

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	32	17	0.73	14	NA	NA
	February	40	20	0.91	15	NA	NA
	March	54	23	1.1	17	NA	NA
	April	130	18	0.78	13	NA	NA
	May	120	20	0.86	13	NA	NA
	June	120	24	1.1	16	NA	NA
Total		490	120	5.4	89	NA	NA

Table 2.6-9. Building 854-Proximal (854-PRX) mass removed, January 1, 2009 through June 30, 2009.

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	2.4	0.63	3.2	NA	NA
	February	NA	6.9	2.6	11	NA	NA
	March	NA	7.5	2.9	12	NA	NA
	April	NA	7.2	2.7	9.9	NA	NA
	May	NA	7.4	2.8	10	NA	NA
	June	NA	5.9	2.3	8.1	NA	NA
Total		NA	37	14	54	NA	NA

Table 2.6-10. Building 854-Distal (854-DIS) mass removed, January 1, 2009 through June 30, 2009.

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	0.038	0.0037	0.019	NA	NA
	March	NA	0.20	0.020	0.10	NA	NA
	April	NA	0.089	0.018	0.084	NA	NA
	May	NA	0.080	0.016	0.076	NA	NA
	June	NA	0.079	0.016	0.075	NA	NA
Total		NA	0.49	0.073	0.36	NA	NA

Table 2.7-1. Building 832-Source (832-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
832-SRC	January	696	696	182	3,534
	February	668	668	148	2,508
	March	816	816	106	9,806
	April	552	552	82	8,625
	May	0	0	0	0
	June	0	0	0	0
Total		2,732	2,732	518	24,473

Table 2.7-2. Building 830-Source (830-SRC) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
830-SRC	January	691	696	1,172	105,921
	February	658	672	1,136	150,074
	March	766	792	1,327	98,465
	April	606	624	979	72,852
	May	677	672	632	30,918
	June	811	816	816	20,371
Total		4,209	4,272	6,062	478,601

Table 2.7-3. Building 830-Distal South (830-DISS) volumes of ground water and soil vapor extracted and discharged, January 1, 2009 through June 30, 2009.

Treatment facility	Month	SVTS Operational hours	GWTS Operational hours	Volume of vapor extracted (thousands of ft^3)	Volume of ground water discharged (gal)
830-DISS	January	NA	696	NA	150,235
	February	NA	336	NA	66,373
	March	NA	720	NA	200,640
	April	NA	624	NA	160,468
	May	NA	696	NA	173,442
	June	NA	792	NA	196,063
Total		NA	3,864	NA	947,221

2.7-4. Building 832 Canyon OU VOCs in ground water 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															
830-SRC-GWTS-E	1/13/09	<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-GWTS-E	2/2/09	<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-GWTS-E	3/2/09	<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-GWTS-E	4/6/09	<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-GWTS-E	5/6/09	<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-GWTS-E	6/8/09	<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-GWTS-I	1/13/09	110 D	0.51	<0.5	<0.5	<0.5	<0.5	<0.5	0.55	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-GWTS-I	4/6/09	240 D	0.89	<0.5	<0.5	<0.5	<0.5	<0.5	0.55	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
830-SRC-GWTS-I	4/6/09 DUP	260 D	0.87	<0.5	<0.5	<0.5	<0.5	<0.5	0.56	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Building 832-Source[b]															
832-SRC-GWTS-E	1/13/09	<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-GWTS-E	2/2/09	<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-GWTS-E	3/2/09	<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-GWTS-E	4/6/09	<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-GWTS-I	1/13/09	52	<0.5	0.77	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-GWTS-I	4/6/09	39	<0.5	0.76	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
832-SRC-GWTS-I	4/6/09 DUP	37	<0.5	0.76	<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 conducted due to VOC treatment at CGSA GWTS.

[b] No influent or effluent monitoring conducted in May or June due to Control System failure.

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

Table 2.7-4 (Cont.). Analyte detected but not reported in main table.

Location	Date	Detection frequency
Building 830-Distal South[a]		
Building 830-Source		
830-SRC-GWTS-E	**1/13/09**	**0 of 18**
830-SRC-GWTS-E	**2/2/09**	**0 of 18**
830-SRC-GWTS-E	**3/2/09**	**0 of 18**
830-SRC-GWTS-E	**4/6/09**	**0 of 18**
830-SRC-GWTS-E	**5/6/09**	**0 of 18**
830-SRC-GWTS-E	**6/8/09**	**0 of 18**
830-SRC-GWTS-I	**1/13/09**	**0 of 18**
830-SRC-GWTS-I	**4/6/09**	**0 of 18**
830-SRC-GWTS-I	**4/6/09 DUP**	**0 of 18**
Building 832-Source[b]		
832-SRC-GWTS-E	**1/13/09**	**0 of 18**
832-SRC-GWTS-E	**2/2/09**	**0 of 18**
832-SRC-GWTS-E	**3/2/09**	**0 of 18**
832-SRC-GWTS-E	**4/6/09**	**0 of 18**
832-SRC-GWTS-I	**1/13/09**	**0 of 18**
832-SRC-GWTS-I	**4/6/09**	**0 of 18**
832-SRC-GWTS-I	**4/6/09 DUP**	**0 of 18**

Notes:

[a] **No influent or effluent monitoring conducted due to VOC treatment at CGSA GWTS.**

[b] **No influent or effluent monitoring conducted in May or June due to Control System failure.**

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

2.7-5. Building 832 Canyon OU nitrate and perchlorate in ground water treatment system influent and effluent.

Location	Date	Nitrate (as NO3) (mg/L)	Perchlorate (µg/L)
Building 830-Distal South			
830-DISS-GWTS-E	1/13/09	63 D	<4
830-DISS-GWTS-E	2/4/09	67 D	<4
830-DISS-GWTS-E	3/3/09	66 D	<4
830-DISS-GWTS-E	4/7/09	68 D	<4
830-DISS-GWTS-E	5/5/09	65 D	<4
830-DISS-GWTS-E	6/9/09	66 D	<4
830-DISS-GWTS-I	1/13/09	72 D	<4
830-DISS-GWTS-I	1/13/09 DUP	-	<4
830-DISS-GWTS-I	4/7/09	75 D	4.2
830-DISS-GWTS-I	4/7/09 DUP	76 D	4.5
Building 830-Source			
830-SRC-GWTS-E	1/13/09	110 D	<4
830-SRC-GWTS-E	2/2/09	16 D	<4
830-SRC-GWTS-E	3/2/09	35 D	<4
830-SRC-GWTS-E	4/6/09	47 D	<4
830-SRC-GWTS-E	5/6/09	38	<4
830-SRC-GWTS-E	6/8/09	74 D	<4
830-SRC-GWTS-I	1/13/09	120 D	4.6
830-SRC-GWTS-I	1/13/09 DUP	-	<4
830-SRC-GWTS-I	4/6/09	120 D	5.6
830-SRC-GWTS-I	4/6/09 DUP	120 D	4.8
Building 832-Source[a]			
832-SRC-GWTS-E	1/13/09	81 D	<4
832-SRC-GWTS-E	2/2/09	89 D	<4
832-SRC-GWTS-E	3/2/09	63 D	<4
832-SRC-GWTS-E	4/6/09	79 D	<4
832-SRC-GWTS-I	1/13/09	120 D	8.3
832-SRC-GWTS-I	1/13/09 DUP	-	6.6
832-SRC-GWTS-I	4/6/09	100 D	7.2
832-SRC-GWTS-I	4/6/09 DUP	100 D	6.6

Notes:

[a] **No influent or effluent monitoring conducted in May or June due to Control System failure.**

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

Table 2.7-6. Building 832 Canyon OU treatment facility sampling and analysis plan.

Sample location	Sample identification	Parameter	Frequency
832-SRC GWTS			
Influent Port	**832-SRC-I**	**VOCs**	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**832-SRC-E**	**VOCs**	**Monthly**
		Perchlorate	**Monthly**
		Nitrate	**Monthly**
		PH	**Monthly**
832-SRC SVTS			
Influent Port	**832-SRC-VI**	**No Monitoring Requirements**	
Effluent Port	**832-SRC-VE**	**VOCs**	**Weekly**[a]
Intermediate GAC	**832-SRC-VCF3I**	**VOCs**	**Weekly**[a]
830-SRC GWTS			
Influent Port	**830-SRC-I**	**VOCs**	**Quarterly**
		Perchlorate	**Quarterly**
		Nitrate	**Quarterly**
		PH	**Quarterly**
Effluent Port	**830-SRC-E**	**VOCs**	**Monthly**
		Perchlorate	**Monthly**
		Nitrate	**Monthly**
		PH	**Monthly**
830-SRC SVTS			
Influent Port	**830-SRC-VI**	**No Monitoring Requirements**	
Effluent Port	**830-SRC-VE**	**VOCs**	**Weekly**[a]
Intermediate GAC	**830-SRC-VCF3I**	**VOCs**	**Weekly**[a]

Table 2.7-6 (Cont.). Building 832 Canyon treatment facility sampling and analysis plans.

Sample Location	Sample Identification	Parameter	Frequency
830-DISS GWTS			
Influent Port	**830-DISS-I**	**Perchlorate**	**Quarterly**
		Nitrate	**Quarterly**
		pH	**Quarterly**
Effluent Port	**830-DISS-E**	**Perchlorate**	**Monthly**
		Nitrate	**Monthly**
		pH	**Monthly**

Notes:

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

[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.**

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

Table 2.7-7. Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
SPRING3	SPR	Qal	A	CMP	E300.0:NO3	1	Y	
SPRING3	SPR	Qal	A	CMP	E300.0:PERC	1	Y	
SPRING3	SPR	Qal	S	CMP	E601	1	Y	
SPRING3	SPR	Qal	S	CMP	E601	3		
SPRING4	SPR	Tps	B	CMP	E300.0:NO3	1	N	Dry. Next sample required 1stQ 2011.
SPRING4	SPR	Tps	B	CMP	E300.0:PERC	1	N	Dry. Next sample required 1stQ 2011.
SPRING4	SPR	Tps	B	CMP	E601	1	N	Dry. Next sample required 1stQ 2011.
SVI-830-031	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
SVI-830-031	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
SVI-830-031	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
SVI-830-031	PTMW	$Tnsc_1$	S	CMP	E601	3		
SVI-830-032	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
SVI-830-032	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
SVI-830-032	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
SVI-830-032	PTMW	$Tnsc_1$	S	CMP	E601	3		
SVI-830-033	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
SVI-830-033	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
SVI-830-033	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
SVI-830-033	PTMW	$Tnsc_1$	S	CMP	E601	3		
SVI-830-035	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
SVI-830-035	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
SVI-830-035	PTMW	$Tnsc_1$	S	CMP	E601	1	Y	
SVI-830-035	PTMW	$Tnsc_1$	S	CMP	E601	3		
W-830-04A	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-04A	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-04A	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-04A	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-05	PTMW	$Tnbs_2$-$Tnsc_{1c}$	A	CMP	E300.0:NO3	1	Y	
W-830-05	PTMW	$Tnbs_2$-$Tnsc_{1c}$	A	CMP	E300.0:PERC	1	Y	
W-830-05	PTMW	$Tnbs_2$-$Tnsc_{1c}$	S	CMP	E601	1	Y	
W-830-05	PTMW	$Tnbs_2$-$Tnsc_{1c}$	S	CMP	E601	3		
W-830-07	PTMW	$Tnsc_1$	A	CMP	E300.0:NO3	1	N	Dry.
W-830-07	PTMW	$Tnsc_1$	A	CMP	E300.0:PERC	1	N	Dry.
W-830-07	PTMW	$Tnsc_1$	S	CMP	E601	1	N	Dry.
W-830-07	PTMW	$Tnsc_1$	S	CMP	E601	3		
W-830-09	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-830-09	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-830-09	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	Y	
W-830-09	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		
W-830-10	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-10	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-10	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-10	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-11	PTMW	$Tnsc_{1c}$	A	CMP	E300.0:NO3	1	Y	
W-830-11	PTMW	$Tnsc_{1c}$	A	CMP	E300.0:PERC	1	Y	
W-830-11	PTMW	$Tnsc_{1c}$	S	CMP	E601	1	Y	
W-830-11	PTMW	$Tnsc_{1c}$	S	CMP	E601	3		

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-830-12	PTMW	Lower $Tnbs_1$	A	CMP	E300.0:NO3	1	N	Inoperable pump.
W-830-12	PTMW	Lower $Tnbs_1$	A	CMP	E300.0:PERC	1	N	Inoperable pump.
W-830-12	PTMW	Lower $Tnbs_1$	S	CMP	E601	1	N	Inoperable pump.
W-830-12	PTMW	Lower $Tnbs_1$	S	CMP	E601	3		
W-830-13	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-830-13	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-830-13	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-830-13	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-830-14	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-14	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-14	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-14	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-15	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-830-15	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-830-15	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	Y	
W-830-15	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		
W-830-16	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	1	Y	
W-830-16	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	1	Y	
W-830-16	GW	$Tnsc_{1b}$	Q	CMP	E601	1	Y	
W-830-16	GW	$Tnsc_{1b}$	Q	CMP	E601	2	Y	
W-830-16	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	3		
W-830-16	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	3		
W-830-16	GW	$Tnsc_{1b}$	Q	CMP	E601	3		
W-830-16	GW	$Tnsc_{1b}$	Q	CMP	E601	4		
W-830-17	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-830-17	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-830-17	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-830-17	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-830-1730	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	1	Y	
W-830-1730	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	1	Y	
W-830-1730	GW	$Tnsc_{1b}$	Q	CMP	E601	1	Y	
W-830-1730	GW	$Tnsc_{1b}$	Q	CMP	E601	2	Y	
W-830-1730	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	3		
W-830-1730	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	3		
W-830-1730	GW	$Tnsc_{1b}$	Q	CMP	E601	3		
W-830-1730	GW	$Tnsc_{1b}$	Q	CMP	E601	4		
W-830-18	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-830-18	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-830-18	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	Y	
W-830-18	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		
W-830-1807	EW	Qal/$Tnsc_1$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-1807	EW	Qal/$Tnsc_1$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-1807	EW	Qal/$Tnsc_1$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-1807	EW	Qal/$Tnsc_1$		DIS	E601	2	Y	830-SRC extraction well.
W-830-1807	EW	Qal/$Tnsc_1$		DIS	E300.0:PERC	3		830-SRC extraction well.
W-830-1807	EW	Qal/$Tnsc_1$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-1807	EW	Qal/$Tnsc_1$		DIS	E601	4		830-SRC extraction well.

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-830-1829	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-1829	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-1829	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-1829	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-1830	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-1830	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-1830	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-1830	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-1831	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	1	Y	
W-830-1831	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	1	Y	
W-830-1831	GW	$Tnsc_{1b}$	Q	CMP	E601	1	Y	
W-830-1831	GW	$Tnsc_{1b}$	Q	CMP	E601	2	Y	
W-830-1831	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	3		
W-830-1831	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	3		
W-830-1831	GW	$Tnsc_{1b}$	Q	CMP	E601	3		
W-830-1831	GW	$Tnsc_{1b}$	Q	CMP	E601	4		
W-830-1832	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-830-1832	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-830-1832	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	Y	
W-830-1832	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		
W-830-19	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-19	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-19	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-19	EW	$Tnsc_{1b}$		DIS	E601	2	Y	830-SRC extraction well.
W-830-19	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-19	EW	$Tnsc_{1b}$		DIS	E601	4		830-SRC extraction well.
W-830-20	GW	Upper $Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
W-830-20	GW	Upper $Tnbs_1$	S	CMP	E300.0:PERC	1	Y	
W-830-20	GW	Upper $Tnbs_1$	Q	CMP	E601	1	Y	
W-830-20	GW	Upper $Tnbs_1$	Q	CMP	E601	2	Y	
W-830-20	GW	Upper $Tnbs_1$	S	CMP	E300.0:NO3	3		
W-830-20	GW	Upper $Tnbs_1$	S	CMP	E300.0:PERC	3		
W-830-20	GW	Upper $Tnbs_1$	Q	CMP	E601	3		
W-830-20	GW	Upper $Tnbs_1$	Q	CMP	E601	4		
W-830-21	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-21	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-21	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-21	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-22	PTMW	$Tnsc_{1a}$	A	CMP	E300.0:NO3	1	Y	
W-830-22	PTMW	$Tnsc_{1a}$	A	CMP	E300.0:PERC	1	Y	
W-830-22	PTMW	$Tnsc_{1a}$	S	CMP	E601	1	Y	
W-830-22	PTMW	$Tnsc_{1a}$	S	CMP	E601	3		
W-830-2213	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-2213	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-2213	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-2213	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-2214	EW	$Tnsc_{1a}$	A	CMP-TF	E300.0:NO3	1	N	Inoperable pump. 830-SRC extraction well.

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-830-2214	EW	$Tnsc_{1a}$	A	CMP-TF	E300.0:PERC	1	N	Inoperable pump. 830-SRC extraction well.
W-830-2214	EW	$Tnsc_{1a}$	S	CMP-TF	E601	1	N	Inoperable pump. 830-SRC extraction well.
W-830-2214	EW	$Tnsc_{1a}$		DIS	E300.0:NO3	3		830-SRC extraction well.
W-830-2214	EW	$Tnsc_{1a}$		DIS	E300.0:PERC	3		830-SRC extraction well.
W-830-2214	EW	$Tnsc_{1a}$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-2214	EW	$Tnsc_{1a}$		DIS	E601	4		830-SRC extraction well.
W-830-2215	EW	Upper $Tnbs_1$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-2215	EW	Upper $Tnbs_1$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-2215	EW	Upper $Tnbs_1$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-2215	EW	Upper $Tnbs_1$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-2215	EW	Upper $Tnbs_1$		DIS	E601	4		830-SRC extraction well.
W-830-2216	EW	$Tnbs_2$	A	CMP-TF	E300.0:NO3	1	Y	830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$	A	CMP-TF	E300.0:PERC	1	Y	830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$	S	CMP-TF	E601	1	Y	830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$		DIS	E601	2	Y	830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$		DIS	E300.0:NO3	3		830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$		DIS	E300.0:PERC	3		830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$	S	CMP-TF	E601	3		830-DISS extraction well.
W-830-2216	EW	$Tnbs_2$		DIS	E601	4		830-DISS extraction well.
W-830-2311	PTMW	$Tnsc_{1a}$	S	CMP	E300.0:NO3	1	Y	
W-830-2311	PTMW	$Tnsc_{1a}$	S	CMP	E300.0:PERC	1	Y	
W-830-2311	PTMW	$Tnsc_{1a}$	S	CMP	E624	1	Y	
W-830-2311	PTMW	$Tnsc_{1a}$	A	CMP	E8330	1	N	No longer required. Sufficient samples have been collected.
W-830-2311	PTMW	$Tnsc_{1a}$		DIS	E601	2	Y	
W-830-2311	PTMW	$Tnsc_{1a}$		DIS	E300.0:NO3	3		
W-830-2311	PTMW	$Tnsc_{1a}$		DIS	E300.0:PERC	3		
W-830-2311	PTMW	$Tnsc_{1a}$	S	CMP	E601	3		
W-830-2311	PTMW	$Tnsc_{1a}$		DIS	E624	4		
W-830-2311	PTMW	$Tnsc_{1a}$		DIS	TBOS	4		
W-830-25	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	N	Dry.
W-830-25	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	N	Dry.
W-830-25	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	N	Dry.
W-830-25	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-26	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	N	Dry.
W-830-26	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	N	Dry.
W-830-26	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	N	Dry.
W-830-26	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		
W-830-27	PTMW	$Tnsc_{1a}$	A	CMP	E300.0:NO3	1	Y	
W-830-27	PTMW	$Tnsc_{1a}$	A	CMP	E300.0:PERC	1	Y	
W-830-27	PTMW	$Tnsc_{1a}$	S	CMP	E601	1	Y	
W-830-27	PTMW	$Tnsc_{1a}$	S	CMP	E601	3		
W-830-28	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-830-28	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-830-28	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	Y	
W-830-28	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-830-29	PTMW	Lower $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-830-29	PTMW	Lower $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-830-29	PTMW	Lower $Tnbs_1$	S	CMP	E601	1	Y	
W-830-29	PTMW	Lower $Tnbs_1$	S	CMP	E601	3		
W-830-30	PTMW	$Qal/Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
W-830-30	PTMW	$Qal/Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
W-830-30	PTMW	$Qal/Tnsc_1$	S	CMP	E601	1	Y	
W-830-30	PTMW	$Qal/Tnsc_1$	S	CMP	E601	3		
W-830-34	PTMW	$Qal/Tnsc_1$	A	CMP	E300.0:NO3	1	Y	
W-830-34	PTMW	$Qal/Tnsc_1$	A	CMP	E300.0:PERC	1	Y	
W-830-34	PTMW	$Qal/Tnsc_1$	S	CMP	E601	1	Y	
W-830-34	PTMW	$Qal/Tnsc_1$	S	CMP	E601	3		
W-830-49	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$	S	CMP-TF	E624	1	Y	830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$		DIS	E601	2	Y	830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$		DIS	E300.0:NO3	3		830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$		DIS	E300.0:PERC	3		830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$	S	CMP-TF	E624	3		830-SRC extraction well.
W-830-49	EW	$Tnsc_{1b}$		DIS	E601	4		830-SRC extraction well.
W-830-50	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-50	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-50	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-50	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-51	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-DISS extraction well.
W-830-51	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-DISS extraction well.
W-830-51	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-DISS extraction well.
W-830-51	EW	$Tnsc_{1b}$		DIS	E601	2	Y	830-DISS extraction well.
W-830-51	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-DISS extraction well.
W-830-52	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-DISS extraction well.
W-830-52	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-DISS extraction well.
W-830-52	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-DISS extraction well.
W-830-52	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-DISS extraction well.
W-830-53	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-DISS extraction well.
W-830-53	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-DISS extraction well.
W-830-53	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-DISS extraction well.
W-830-53	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-DISS extraction well.
W-830-54	PTMW	$Tnsc_{1c}$	A	CMP	E300.0:NO3	1	Y	
W-830-54	PTMW	$Tnsc_{1c}$	A	CMP	E300.0:PERC	1	Y	
W-830-54	PTMW	$Tnsc_{1c}$	S	CMP	E601	1	Y	
W-830-54	PTMW	$Tnsc_{1c}$	S	CMP	E601	3		
W-830-55	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-55	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-55	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-55	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-56	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-56	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-830-56	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-56	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-57	EW	Upper $Tnbs_1$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-57	EW	Upper $Tnbs_1$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-57	EW	Upper $Tnbs_1$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-57	EW	Upper $Tnbs_1$		DIS	E601	2	Y	830-SRC extraction well.
W-830-57	EW	Upper $Tnbs_1$		DIS	E300.0:PERC	3		830-SRC extraction well.
W-830-57	EW	Upper $Tnbs_1$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-57	EW	Upper $Tnbs_1$		DIS	E601	4		830-SRC extraction well.
W-830-58	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-830-58	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-830-58	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-830-58	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-830-59	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-59	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-59	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-59	EW	$Tnsc_{1b}$		DIS	E601	2	Y	830-SRC extraction well.
W-830-59	EW	$Tnsc_{1b}$		DIS	E300.0:PERC	3		830-SRC extraction well.
W-830-59	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-59	EW	$Tnsc_{1b}$		DIS	E601	4		830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$	A	CMP-TF	E300.0:NO3	1	Y	830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$	A	CMP-TF	E300.0:PERC	1	Y	830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$	S	CMP-TF	E601	1	Y	830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$		DIS	E601	2	Y	830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$		DIS	E300.0:PERC	3		830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$	S	CMP-TF	E601	3		830-SRC extraction well.
W-830-60	EW	Upper $Tnbs_1$		DIS	E601	4		830-SRC extraction well.
W-831-01	MWB	Lower $Tnbs_1$	B	CMP	E300.0:NO3	1	Y	Next sample required 1stQ 2011.
W-831-01	MWB	Lower $Tnbs_1$	B	CMP	E300.0:PERC	1	Y	Next sample required 1stQ 2011.
W-831-01	MWB	Lower $Tnbs_1$	B	CMP	E601	1	Y	Next sample required 1stQ 2011.
W-832-01	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	832-SRC extraction well.
W-832-01	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	832-SRC extraction well.
W-832-01	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	832-SRC extraction well.
W-832-01	EW	$Tnsc_{1b}$		DIS	E601	2	Y	832-SRC extraction well.
W-832-01	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		832-SRC extraction well.
W-832-06	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-832-06	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-832-06	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-832-06	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-832-09	PTMW	Lower $Tnbs_1$	A	CMP	E300.0:NO3	1	Y	
W-832-09	PTMW	Lower $Tnbs_1$	A	CMP	E300.0:PERC	1	Y	
W-832-09	PTMW	Lower $Tnbs_1$	S	CMP	E601	1	Y	
W-832-09	PTMW	Lower $Tnbs_1$	S	CMP	E601	3		
W-832-10	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	832-SRC extraction well.
W-832-10	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	832-SRC extraction well.
W-832-10	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	832-SRC extraction well.

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-832-10	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		832-SRC extraction well.
W-832-10	EW	$Tnsc_{1b}$		DIS	E601	4		832-SRC extraction well.
W-832-11	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	832-SRC extraction well.
W-832-11	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	832-SRC extraction well.
W-832-11	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	832-SRC extraction well.
W-832-11	EW	$Tnsc_{1b}$		DIS	E601	2	Y	832-SRC extraction well.
W-832-11	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		832-SRC extraction well.
W-832-12	EW	Qal/fill	A	CMP-TF	E300.0:NO3	1	Y	832-SRC extraction well.
W-832-12	EW	Qal/fill	A	CMP-TF	E300.0:PERC	1	Y	832-SRC extraction well.
W-832-12	EW	Qal/fill	S	CMP-TF	E601	1	Y	832-SRC extraction well.
W-832-12	EW	Qal/fill		DIS	E601	2	Y	832-SRC extraction well.
W-832-12	EW	Qal/fill	S	CMP-TF	E601	3		832-SRC extraction well.
W-832-13	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	Y	Non-active 832-SRC extraction well.
W-832-13	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	Y	Non-active 832-SRC extraction well.
W-832-13	PTMW	Qal/fill	S	CMP	E601	1	Y	Non-active 832-SRC extraction well.
W-832-13	PTMW	Qal/fill	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-14	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	N	Dry. Non-active 832-SRC extraction well.
W-832-14	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	N	Dry. Non-active 832-SRC extraction well.
W-832-14	PTMW	Qal/fill	S	CMP	E601	1	N	Dry. Non-active 832-SRC extraction well.
W-832-14	PTMW	Qal/fill	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-15	EW	Qal/fill	B	CMP-TF	E8330:R+H	1	N	832-SRC extraction well. No longer required. HE compounds have not been detected in this area.
W-832-15	EW	Qal/fill	A	CMP-TF	E300.0:NO3	1	Y	832-SRC extraction well.
W-832-15	EW	Qal/fill	A	CMP-TF	E300.0:PERC	1	Y	832-SRC extraction well.
W-832-15	EW	Qal/fill	S	CMP-TF	E601	1	Y	832-SRC extraction well.
W-832-15	EW	Qal/fill		DIS	E601	2	Y	832-SRC extraction well.
W-832-15	EW	Qal/fill	S	CMP-TF	E601	3		832-SRC extraction well.
W-832-16	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	N	Dry. Non-active 832-SRC extraction well.
W-832-16	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	N	Dry. Non-active 832-SRC extraction well.
W-832-16	PTMW	Qal/fill	S	CMP	E601	1	N	Dry. Non-active 832-SRC extraction well.
W-832-16	PTMW	Qal/fill	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-17	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	N	Dry. Non-active 832-SRC extraction well.
W-832-17	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	N	Dry. Non-active 832-SRC extraction well.
W-832-17	PTMW	Qal/fill	S	CMP	E601	1	N	Dry. Non-active 832-SRC extraction well.
W-832-17	PTMW	Qal/fill	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-18	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	N	Dry. Non-active 832-SRC extraction well.
W-832-18	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	N	Dry. Non-active 832-SRC extraction well.
W-832-18	PTMW	Qal/fill	S	CMP	E601	1	N	Dry. Non-active 832-SRC extraction well.

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-832-18	PTMW	Qal/fill	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-19	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	N	Dry.
W-832-19	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	N	Dry.
W-832-19	PTMW	Qal/fill	S	CMP	E601	1	N	Dry.
W-832-19	PTMW	Qal/fill	S	CMP	E601	3		
W-832-1927	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-832-1927	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-832-1927	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-832-1927	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-832-20	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	N	Dry. Non-active 832-SRC extraction well.
W-832-20	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	N	Dry. Non-active 832-SRC extraction well.
W-832-20	PTMW	Qal/fill	S	CMP	E601	1	N	Dry. Non-active 832-SRC extraction well.
W-832-20	PTMW	Qal/fill	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-21	PTMW	Qal/fill	A	CMP	E300.0:NO3	1	Y	
W-832-21	PTMW	Qal/fill	A	CMP	E300.0:PERC	1	Y	
W-832-21	PTMW	Qal/fill	S	CMP	E601	1	Y	
W-832-21	PTMW	Qal/fill	S	CMP	E601	3		
W-832-2112	GW	Upper $Tnbs_1$	S	CMP	E300.0:NO3	1	Y	
W-832-2112	GW	Upper $Tnbs_1$	S	CMP	E300.0:PERC	1	Y	
W-832-2112	GW	Upper $Tnbs_1$	Q	CMP	E601	1	Y	
W-832-2112	GW	Upper $Tnbs_1$	Q	CMP	E601	2	Y	
W-832-2112	GW	Upper $Tnbs_1$	S	CMP	E300.0:NO3	3		
W-832-2112	GW	Upper $Tnbs_1$	S	CMP	E300.0:PERC	3		
W-832-2112	GW	Upper $Tnbs_1$	Q	CMP	E601	3		
W-832-2112	GW	Upper $Tnbs_1$	Q	CMP	E601	4		
W-832-2112	GW	Upper $Tnbs_1$		DIS	TBOS	4		
W-832-22	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	1	N	Non-active 832-SRC extraction well.
W-832-22	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	1	N	Non-active 832-SRC extraction well.
W-832-22	PTMW	Upper $Tnbs_1$	S	CMP	E601	1	N	Non-active 832-SRC extraction well.
W-832-22	PTMW	Upper $Tnbs_1$	S	CMP	E601	3		Non-active 832-SRC extraction well.
W-832-23	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-832-23	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-832-23	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-832-23	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-832-24	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:NO3	1	Y	
W-832-24	PTMW	$Tnsc_{1b}$	A	CMP	E300.0:PERC	1	Y	
W-832-24	PTMW	$Tnsc_{1b}$	S	CMP	E601	1	Y	
W-832-24	PTMW	$Tnsc_{1b}$	S	CMP	E601	3		
W-832-25	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:NO3	1	Y	832-SRC extraction well.
W-832-25	EW	$Tnsc_{1b}$	A	CMP-TF	E300.0:PERC	1	Y	832-SRC extraction well.
W-832-25	EW	$Tnsc_{1b}$	S	CMP-TF	E601	1	Y	832-SRC extraction well.
W-832-25	EW	$Tnsc_{1b}$		DIS	E601	2	Y	832-SRC extraction well.
W-832-25	EW	$Tnsc_{1b}$		DIS	E300.0:NO3	3		832-SRC extraction well.
W-832-25	EW	$Tnsc_{1b}$		DIS	E300.0:PERC	3		832-SRC extraction well.
W-832-25	EW	$Tnsc_{1b}$	S	CMP-TF	E601	3		832-SRC extraction well.

Table 2.7-7 (Cont.). Building 832 Canyon OU ground and surface water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-832-25	EW	$Tnsc_{1b}$		DIS	E601	4		832-SRC extraction well.
W-832-SC1	PTMW	Qal	A	CMP	E300.0:NO3	1	N	Dry.
W-832-SC1	PTMW	Qal	A	CMP	E300.0:PERC	1	N	Dry.
W-832-SC1	PTMW	Qal	S	CMP	E601	1	N	Dry.
W-832-SC1	PTMW	Qal	S	CMP	E601	3		
W-832-SC2	PTMW	Qal	A	CMP	E300.0:NO3	1	N	Dry.
W-832-SC2	PTMW	Qal	A	CMP	E300.0:PERC	1	N	Dry.
W-832-SC2	PTMW	Qal	S	CMP	E601	1	N	Dry.
W-832-SC2	PTMW	Qal	S	CMP	E601	3		
W-832-SC3	PTMW	Qal	A	CMP	E300.0:NO3	1	Y	
W-832-SC3	PTMW	Qal	A	CMP	E300.0:PERC	1	Y	
W-832-SC3	PTMW	Qal	S	CMP	E601	1	Y	
W-832-SC3	PTMW	Qal	S	CMP	E601	3		
W-832-SC4	PTMW	Qal	A	CMP	E300.0:NO3	1	N	Dry.
W-832-SC4	PTMW	Qal	A	CMP	E300.0:PERC	1	N	Dry.
W-832-SC4	PTMW	Qal	S	CMP	E601	1	N	Dry.
W-832-SC4	PTMW	Qal	S	CMP	E601	3		
W-870-01	PTMW	Qal	A	CMP	E300.0:NO3	1	N	Dry.
W-870-01	PTMW	Qal	A	CMP	E300.0:PERC	1	N	Dry.
W-870-01	PTMW	Qal	S	CMP	E601	1	N	Dry.
W-870-01	PTMW	Qal	S	CMP	E601	3		
W-870-02	PTMW	$Tnbs_2$	A	CMP	E300.0:NO3	1	Y	
W-870-02	PTMW	$Tnbs_2$	A	CMP	E300.0:PERC	1	Y	
W-870-02	PTMW	$Tnbs_2$	S	CMP	E601	1	Y	
W-870-02	PTMW	$Tnbs_2$	S	CMP	E601	3		
W-880-01	GW	$Tnbs_2$	S	CMP	E300.0:NO3	NA		See High Explosives Process Area.
W-880-01	GW	$Tnbs_2$	S	CMP	E300.0:PERC	NA		See High Explosives Process Area.
W-880-01	GW	$Tnbs_2$	Q	CMP	E601	NA		See High Explosives Process Area.
W-880-02	GW	Qal	S	CMP	E300.0:NO3	NA		See High Explosives Process Area.
W-880-02	GW	Qal	S	CMP	E300.0:PERC	NA		See High Explosives Process Area.
W-880-02	GW	Qal	Q	CMP	E601	NA		See High Explosives Process Area.
W-880-03	GW	$Tnsc_{1b}$	S	CMP	E300.0:NO3	NA		See High Explosives Process Area.
W-880-03	GW	$Tnsc_{1b}$	S	CMP	E300.0:PERC	NA		See High Explosives Process Area.
W-880-03	GW	$Tnsc_{1b}$	Q	CMP	E601	NA		See High Explosives Process Area.

Notes:
Building 830 primary Contaminants of Concern in Ground Water: VOCs (E601 or E624).
Building 830 secondary COC: nitrate (E300:NO3).
Building 830 secondary COC: perchlorate (E300.0:PERC).
Building 832 primary Contaminants of Concern in Ground Water: VOCs (E601 or E624).
Building 832 secondary COC: nitrate (E300:NO3).
Building 832 secondary COC: perchlorate (E300.0:PERC).
See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.7-8. Building 832-Source (832-SRC) mass removed, January 1, 2009 through June 30, 2009.

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	11	0.98	0.11	1.7	NA	NA
	February	9.0	0.14	0.077	1.1	NA	NA
	March	0	1.0	0.26	3.7	NA	NA
	April	0	1.7	0.22	3.3	NA	NA
	May	0	0	0	0	NA	NA
	June	0	0	0	0	NA	NA
Total		20	3.9	0.66	9.8	NA	NA

Table 2.7-9. Building 830-Source (830-SRC) mass removed, January 1, 2009 through June 30, 2009.

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	39	34	0.25	11	NA	NA
	February	38	62	0.28	12	NA	NA
	March	16	110	0.37	14	NA	NA
	April	13	100	0.28	10	NA	NA
	May	79	85	0.22	7.8	NA	NA
	June	100	90	0.22	7.3	NA	NA
Total		290	480	1.6	62	NA	NA

Table 2.7-10. Building 830-Distal South (830-DISS) mass removed, January 1, 2009 through June 30, 2009.

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	19	2.2	40	NA	NA
	February	NA	7.7	0.84	17	NA	NA
	March	NA	21	2.5	53	NA	NA
	April	NA	15	1.9	41	NA	NA
	May	NA	16	2.0	44	NA	NA
	June	NA	18	2.2	49	NA	NA
Total		NA	97	12	240	NA	NA

Table 2.8-1. Building 801 and Pit 8 Landfill area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K8-01	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K8-01	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
K8-01	PTMW	Upper $Tnbs_1$	S	CMP	E601	2	Y	
K8-01	PTMW	Upper $Tnbs_1$		DIS	E906	2	Y	
K8-01	PTMW	Upper $Tnbs_1$	S	CMP	E601	4		
K8-01	PTMW	Upper $Tnbs_1$		DIS	E906	4		
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	Q	CMP	E906	1	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	CMPTRIMET	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	E340.2	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	E601	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	E8330	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	Q	CMP	E906	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	A	CMP	T26METALS	2	Y	
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	Q	CMP	E906	3		
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$		DIS	E601	4		
K8-02B	CMP DMW	$Tnsc_1$/Upper $Tnbs_1$	Q	CMP	E906	4		
K8-03B	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K8-03B	PTMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
K8-03B	PTMW	Upper $Tnbs_1$	S	CMP	E601	2	Y	
K8-03B	PTMW	Upper $Tnbs_1$	S	CMP	E601	4		
K8-04	CMP DMW	Upper $Tnbs_1$	Q	CMP	E906	1	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	CMPTRIMET	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	E340.2	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	E601	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	E8330	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	Q	CMP	E906	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
K8-04	CMP DMW	Upper $Tnbs_1$	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
K8-04	CMP DMW	Upper $Tnbs_1$	A	CMP	T26METALS	2	Y	
K8-04	CMP DMW	Upper $Tnbs_1$	Q	CMP	E906	3		

Table 2.8-1 (Cont.). Building 801 and Pit 8 Landfill area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K8-04	CMP DMW	Upper $Tnbs_1$		DIS	E601	4		
K8-04	CMP DMW	Upper $Tnbs_1$	Q	CMP	E906	4		
K8-05	CMP DMW	$Tnbs_2$	B	CMP	CMPTRIMET	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	E300.0:NO3	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	E300.0:PERC	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	E340.2	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	E601	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	E8330	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	E906	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	MS:THISO	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	MS:UISO	2	N	Dry.
K8-05	CMP DMW	$Tnbs_2$	B	CMP	T26METALS	2	N	Dry.

Notes:
No COCs in ground water.
CMP Detection monitoring analyte: tritium (E906) sampled quarterly.
CMP Detection monitoring analyte: VOCs (E601 or E624) sampled annually.
CMP Detection monitoring analyte: fluoride (E340.2) sampled annually.
CMP Detection monitoring analyte: HE compounds (E8330:R+H) sampled annually.
CMP Detection monitoring analyte: nitrate (E300.0:NO3) sampled annually.
CMP Detection monitoring analyte: perchlorate (E300.0:PERC) sampled annually.
CMP Detection monitoring analytes: Title 26 metals plus U, Th, Li, Be (T26METALS and CMPTRIMET) sampled annually.
CMP Detection monitoring analytes: uranium and thorium isotopes by mass spectrometry (MS:UISO and MS:THISO) sampled biennially.
Contaminants of Concern in the Vadose Zone not detected in Ground Water: HE Compounds and uranium.
Building 801 primary COC: VOCs (E601 or E624).
Building 801 secondary COC: nitrate (E300.0:NO3).
Building 801 secondary COC: uranium (MS:UISO) .
See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.8-2. Building 833 area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-833-03	PTMW	Tps	A	CMP	E601	1	N	Dry.
W-833-12	PTMW	Tps	A	CMP	E601	1	N	Insufficient water.
W-833-18	PTMW	Tps	A	CMP	E601	1	N	Dry.
W-833-22	PTMW	Tps	B	CMP	E601	1	NA	Next sample required 1stQ 2010.
W-833-28	PTMW	Tps	A	CMP	E601	1	N	Dry.
W-833-30	PTMW	Lower $Tnbs_1$	S	CMP	E601	1	Y	
W-833-30	PTMW	Lower $Tnbs_1$	S	CMP	E601	3		
W-833-33	PTMW	Tps	B	CMP	E601	1	NA	Next sample required 1stQ 2010.
W-833-34	PTMW	Tps	A	CMP	E601	1	N	Insufficient water.
W-833-43	PTMW	Tps	B	CMP	E601	1	N	Dry.
W-840-01	PTMW	Lower $Tnbs_1$		DIS	E300.0:NO3	1	Y	
W-840-01	PTMW	Lower $Tnbs_1$		DIS	E300.0:PERC	1	Y	
W-840-01	PTMW	Lower $Tnbs_1$		DIS	E601	1	Y	
W-841-01	PTMW	Upper $Tnbs_1$		DIS	E300.0:NO3	1	N	Dry.
W-841-01	PTMW	Upper $Tnbs_1$		DIS	E300.0:PERC	1	N	Dry.
W-841-01	PTMW	Upper $Tnbs_1$		DIS	E601	1	N	Dry.

Notes:

Building 833 primary COC: VOCs (E601).

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

Table 2.8-3. Building 845 Firing Table and Pit 9 Landfill area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K9-01	CMP DMW	Tmss	Q	CMP	E906	1	Y	
K9-01	CMP DMW	Tmss	A	CMP	CMPTRIMET	2	Y	
K9-01	CMP DMW	Tmss	A	CMP	E300.0:NO3	2	Y	
K9-01	CMP DMW	Tmss	A	CMP	E300.0:PERC	2	Y	
K9-01	CMP DMW	Tmss	A	CMP	E340.2	2	Y	
K9-01	CMP DMW	Tmss	A	CMP	E601	2	Y	
K9-01	CMP DMW	Tmss	A	CMP	E8330	2	Y	
K9-01	CMP DMW	Tmss	Q	CMP	E906	2	Y	
K9-01	CMP DMW	Tmss	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
K9-01	CMP DMW	Tmss	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
K9-01	CMP DMW	Tmss	A	CMP	T26METALS	2	Y	
K9-01	CMP DMW	Tmss	Q	CMP	E906	3		
K9-01	CMP DMW	Tmss	Q	CMP	E906	4		
K9-02	CMP DMW	Tmss	Q	CMP	E906	1	Y	
K9-02	CMP DMW	Tmss	A	CMP	CMPTRIMET	2	Y	
K9-02	CMP DMW	Tmss	A	CMP	E300.0:NO3	2	Y	
K9-02	CMP DMW	Tmss	A	CMP	E300.0:PERC	2	Y	
K9-02	CMP DMW	Tmss	A	CMP	E340.2	2	Y	
K9-02	CMP DMW	Tmss	A	CMP	E601	2	Y	
K9-02	CMP DMW	Tmss	A	CMP	E8330	2	Y	
K9-02	CMP DMW	Tmss	Q	CMP	E906	2	Y	
K9-02	CMP DMW	Tmss	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
K9-02	CMP DMW	Tmss	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
K9-02	CMP DMW	Tmss	A	CMP	T26METALS	2	Y	
K9-02	CMP DMW	Tmss	Q	CMP	E906	3		
K9-02	CMP DMW	Tmss	Q	CMP	E906	4		
K9-03	CMP DMW	Tmss	Q	CMP	E906	1	Y	
K9-03	CMP DMW	Tmss	A	CMP	CMPTRIMET	2	Y	
K9-03	CMP DMW	Tmss	A	CMP	E300.0:NO3	2	Y	
K9-03	CMP DMW	Tmss	A	CMP	E300.0:PERC	2	Y	
K9-03	CMP DMW	Tmss	A	CMP	E340.2	2	Y	
K9-03	CMP DMW	Tmss	A	CMP	E601	2	Y	
K9-03	CMP DMW	Tmss	A	CMP	E8330	2	Y	
K9-03	CMP DMW	Tmss	Q	CMP	E906	2	Y	
K9-03	CMP DMW	Tmss	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
K9-03	CMP DMW	Tmss	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
K9-03	CMP DMW	Tmss	A	CMP	T26METALS	2	Y	
K9-03	CMP DMW	Tmss	Q	CMP	E906	3		
K9-03	CMP DMW	Tmss	Q	CMP	E906	4		
K9-04	CMP DMW	Tmss	Q	CMP	E906	1	Y	
K9-04	CMP DMW	Tmss	A	CMP	CMPTRIMET	2	Y	
K9-04	CMP DMW	Tmss	A	CMP	E300.0:NO3	2	Y	
K9-04	CMP DMW	Tmss	A	CMP	E300.0:PERC	2	Y	
K9-04	CMP DMW	Tmss	A	CMP	E340.2	2	Y	
K9-04	CMP DMW	Tmss	A	CMP	E601	2	Y	
K9-04	CMP DMW	Tmss	A	CMP	E8330	2	Y	
K9-04	CMP DMW	Tmss	Q	CMP	E906	2	Y	
K9-04	CMP DMW	Tmss	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
K9-04	CMP DMW	Tmss	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
K9-04	CMP DMW	Tmss	A	CMP	T26METALS	2	Y	
K9-04	CMP DMW	Tmss	Q	CMP	E906	3		
K9-04	CMP DMW	Tmss	Q	CMP	E906	4		

Notes appear on the following page.

Table 2.8-3 (Cont.). Building 845 Firing Table and Pit 9 Landfill area ground water sampling and analysis plan.

Notes:
No COCs in ground water.
CMP Detection monitoring analyte: tritium (E906) sampled quarterly.
CMP Detection monitoring analyte: VOCs (E601 or E624) sampled annually.
CMP Detection monitoring analyte: fluoride (E340.2) sampled annually.
CMP Detection monitoring analyte: HE compounds (E8330:R+H) sampled annually.
CMP Detection monitoring analyte: nitrate (E300.0:NO3) sampled annually.
CMP Detection monitoring analyte: perchlorate (E300.0:PERC) sampled annually.
CMP Detection monitoring analytes: Title 26 metals plus U, Th, Li, Be (T26METALS and CMPTRIMET) sampled annually.
CMP Detection monitoring analytes: uranium and thorium isotopes by mass spectrometry (MS:UISO and MS:THISO) sampled biennially.
Contaminants of Concern in the Vadose Zone not detected in Ground Water: HE Compounds and uranium.
See Acronyms and Abbreviations in the Tables section of this report for acronym and abbreviation definitions.

Table 2.8-4.Building 851 area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-851-05	PTMW	Tmss	B	CMP	E601	2	Y	Next sample required 2ndQ 2011.
W-851-05	PTMW	Tmss	A	CMP	E906	2	Y	
W-851-05	PTMW	Tmss	S	CMP	MS:UISO	2	Y	
W-851-05	PTMW	Tmss	S	CMP	MS:UISO	4		
W-851-06	PTMW	Tmss	A	CMP	E906	2	Y	
W-851-06	PTMW	Tmss	S	CMP	MS:UISO	2	Y	
W-851-06	PTMW	Tmss	S	CMP	MS:UISO	4		
W-851-07	PTMW	Tmss	A	CMP	E906	2	Y	
W-851-07	PTMW	Tmss	S	CMP	MS:UISO	2	Y	
W-851-07	PTMW	Tmss	S	CMP	MS:UISO	4		
W-851-08	PTMW	Tmss	A	CMP	E906	2	Y	
W-851-08	PTMW	Tmss	S	CMP	MS:UISO	2	Y	
W-851-08	PTMW	Tmss	S	CMP	MS:UISO	4		

Notes:

Building 851 primary COC: uranium (MS:UISO).

Contaminants of Concern in the Vadose Zone not detected in Ground Water: VOCs (E601).

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

Table 3.1-1. Pit 2 Landfill area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
K2-01C*	DMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
K2-01C*	DMW	$Tnbs_1$	Q	CMP	E906	1	Y	
K2-01C*	DMW	$Tnbs_1$		DIS	MS:UISO	1	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	CMPTRIMET	2	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	E340.2	2	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	E601	2	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	E8330	2	Y	
K2-01C*	DMW	$Tnbs_1$	Q	CMP	E906	2	Y	
K2-01C*	DMW	$Tnbs_1$	B	CMP	MS:THISO	2	Y	
K2-01C*	DMW	$Tnbs_1$	B	CMP	MS:UISO	2	Y	
K2-01C*	DMW	$Tnbs_1$	A	CMP	T26METALS	2	Y	
K2-01C*	DMW	$Tnbs_1$		DIS	E300.0:PERC	3		
K2-01C*	DMW	$Tnbs_1$	Q	CMP	E906	3		
K2-01C*	DMW	$Tnbs_1$		DIS	MS:UISO	3		
K2-01C*	DMW	$Tnbs_1$	Q	CMP	E906	4		
K2-01C*	DMW	$Tnbs_1$		DIS	MS:UISO	4		
NC2-08	DMW	$Tnbs_1$		DIS	E300.0:PERC	1	Y	
NC2-08	DMW	$Tnbs_1$	Q	CMP	E906	1	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	CMPTRIMET	2	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	E340.2	2	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	E601	2	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	E8330	2	Y	
NC2-08	DMW	$Tnbs_1$	Q	CMP	E906	2	Y	
NC2-08	DMW	$Tnbs_1$	B	CMP	MS:THISO	2	Y	
NC2-08	DMW	$Tnbs_1$	B	CMP	MS:UISO	2	Y	
NC2-08	DMW	$Tnbs_1$	A	CMP	T26METALS	2	Y	
NC2-08	DMW	$Tnbs_1$		DIS	E300.0:PERC	3		
NC2-08	DMW	$Tnbs_1$	Q	CMP	E906	3		
NC2-08	DMW	$Tnbs_1$	Q	CMP	E906	4		
NC2-08	DMW	$Tnbs_1$		DIS	MS:UISO	4		
W-PIT2-1934	DMW	Lower $Tnbs_1$		DIS	E300.0:PERC	1	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	Q	CMP	E906	1	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$		DIS	MS:UISO	1	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	CMPTRIMET	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	E340.2	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	E601	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	E8330	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	Q	CMP	E906	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
W-PIT2-1934	DMW	Lower $Tnbs_1$	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.

Table 3.1-1 (Cont.). Pit 2 Landfill area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-PIT2-1934	DMW	Lower $Tnbs_1$	A	CMP	T26METALS	2	Y	
W-PIT2-1934	DMW	Lower $Tnbs_1$		DIS	E300.0:PERC	3		
W-PIT2-1934	DMW	Lower $Tnbs_1$	Q	CMP	E906	3		
W-PIT2-1934	DMW	Lower $Tnbs_1$		DIS	MS:UISO	3		
W-PIT2-1934	DMW	Lower $Tnbs_1$	Q	CMP	E906	4		
W-PIT2-1935	DMW	Lower $Tnbs_1$		DIS	E300.0:PERC	1	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	Q	CMP	E906	1	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$		DIS	MS:UISO	1	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	CMPTRIMET	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	E300.0:NO3	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	E300.0:PERC	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	E340.2	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	E601	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	E8330	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	Q	CMP	E906	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$	B	CMP	MS:THISO	2	Y	Next sample required 2ndQ 2011.
W-PIT2-1935	DMW	Lower $Tnbs_1$	B	CMP	MS:UISO	2	Y	Next sample required 2ndQ 2011.
W-PIT2-1935	DMW	Lower $Tnbs_1$	A	CMP	T26METALS	2	Y	
W-PIT2-1935	DMW	Lower $Tnbs_1$		DIS	E300.0:PERC	3		
W-PIT2-1935	DMW	Lower $Tnbs_1$	Q	CMP	E906	3		
W-PIT2-1935	DMW	Lower $Tnbs_1$		DIS	MS:UISO	3		
W-PIT2-1935	DMW	Lower $Tnbs_1$	Q	CMP	E906	4		
W-PIT2-2226	GW	$Tnbs_1/Tnbs_0$	Q	CMP	E906	1	Y	
W-PIT2-2226	GW	$Tnbs_1/Tnbs_0$	Q	CMP	E906	2	Y	
W-PIT2-2226	GW	$Tnbs_1/Tnbs_0$	Q	CMP	E906	3		
W-PIT2-2226	GW	$Tnbs_1/Tnbs_0$	Q	CMP	E906	4		
W-PIT2-2301	PTMW	Qal/WBR		DIS	E300.0:PERC	1	Y	
W-PIT2-2301	PTMW	Qal/WBR		DIS	E906	1	Y	
W-PIT2-2301	PTMW	Qal/WBR		DIS	MS:UISO	1	Y	
W-PIT2-2301	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	Insufficient water.
W-PIT2-2301	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	Insufficient water.
W-PIT2-2301	PTMW	Qal/WBR	S	CMP	E906	2	N	Insufficient water.
W-PIT2-2301	PTMW	Qal/WBR	A	CMP	MS:UISO	2	N	Insufficient water.
W-PIT2-2301	PTMW	Qal/WBR	S	CMP	E906	4		
W-PIT2-2302	PTMW	Qal/WBR		DIS	E300.0:PERC	1	Y	
W-PIT2-2302	PTMW	Qal/WBR		DIS	E906	1	Y	
W-PIT2-2302	PTMW	Qal/WBR		DIS	MS:UISO	1	Y	
W-PIT2-2302	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	Insufficient water.
W-PIT2-2302	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	Insufficient water.
W-PIT2-2302	PTMW	Qal/WBR	S	CMP	E906	2	N	Insufficient water.
W-PIT2-2302	PTMW	Qal/WBR	A	CMP	MS:UISO	2	N	Insufficient water.
W-PIT2-2302	PTMW	Qal/WBR	S	CMP	E906	4		
W-PIT2-2303	PTMW	Qal/WBR		DIS	E300.0:PERC	1	Y	
W-PIT2-2303	PTMW	Qal/WBR		DIS	E906	1	Y	
W-PIT2-2303	PTMW	Qal/WBR		DIS	MS:UISO	1	Y	
W-PIT2-2303	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	Dry.
W-PIT2-2303	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	Dry.
W-PIT2-2303	PTMW	Qal/WBR	S	CMP	E906	2	N	Dry.
W-PIT2-2303	PTMW	Qal/WBR	A	CMP	MS:UISO	2	N	Dry.
W-PIT2-2303	PTMW	Qal/WBR	S	CMP	E906	4		
W-PIT2-2304	PTMW	Qal/WBR	A	CMP	E300.0:NO3	2	N	Dry.
W-PIT2-2304	PTMW	Qal/WBR	A	CMP	E300.0:PERC	2	N	Dry.
W-PIT2-2304	PTMW	Qal/WBR	S	CMP	E906	2	N	Dry.

Table 3.1-1 (Cont.). Pit 2 Landfill area ground water sampling and analysis plan.

Sampling location	Location type	Completion interval	Sampling frequency required	Sample driver	Requested analysis	Sampling quarter	Sampled Y/N	Comment
W-PIT2-2304	PTMW	Qal/WBR	A	CMP	MS:UISO	2	N	Dry.
W-PIT2-2304	PTMW	Qal/WBR	S	CMP	E906	4		
W-PIT2-2304	PTMW	Qal/WBR		DIS	MS:UISO	4		

Notes:
Pit 2 Landfill primary COC: nitrate (E300:NO3).
CMP Detection monitoring analyte: tritium (E906) sampled quarterly.
CMP Detection monitoring analyte: VOCs (E601 or E624) sampled annually.
CMP Detection monitoring analyte: fluoride (E340.2) sampled annually.
CMP Detection monitoring analyte: HE compounds (E8330:R+H) sampled annually.
CMP Detection monitoring analyte: nitrate (E300.0:NO3) sampled annually.
CMP Detection monitoring analyte: perchlorate (E300.0:PERC) sampled annually.
CMP Detection monitoring analytes: Title 26 metals plus U, Th, Li, Be (T26METALS and CMPTRIMET) sampled annually.
CMP Detection monitoring analytes: uranium and thorium isotopes by mass spectrometry (MS:UISO and MS:THISO) sampled biennially.
***Well sampled as part of the surveillance monitoring performed by the Water Guidance and Monitoring Group (WGMG) for additional constiutents and the results are reported in the LLNL Site Annual Environmental Report.**

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

Table 4-1. Analytical results for the first semester 2009 ambient air sampling at Spring 3.

Constitutent	SPRING3-001 Results (ppbv)	SPRING3-002 Results (ppbv)	SPRING3-003 Results (ppbv)	SL[a] (ppbv)
Chloroform	<0.02	<0.02	<0.02	0.11
1,2-Dichloroethane	<0.02	0.027	<0.02	0.12
1,1-Dichloroethene	<0.02	<0.02	<0.02	220
Cis-1,2-Dichloroethene	<0.02	<0.02	<0.02	No SL
Trans-1,2-Dichloroethene	<0.02	<0.02	<0.02	66
1,2-Dichloropropane	<0.02	<0.02	<0.02	0.26
Methylene chloride	0.907	0.0254	1.45	7.5
Tetrachloroethene	0.041	0.477	0.021	0.31
1,1,2-Trichloroethane	<0.02	<0.02	<0.02	0.14
Trichloroethene	<0.02	0.084	0.025	1.1
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	<0.02	<0.02	<0.02	17,000
Vinyl chloride	<0.02	<0.02	<0.02	1.1

Notes:

Samples collected on 6/9/08 in SUMMA canisters and analyzed by EPA method TO14.

[a] Industrial Air Regional Screening Levels for Chemical Contaminants at Superfund Sites, as of July 7, 2008 converted from μg/m^3 to ppbv.

Appendix A

Results of Influent and Effluent ph Monitoring

A-1. Results of infuent and effluent pH, and effluent dissolved oxygen monitoring, January through June 2009.

Sample Location	Sample Date	Influent pH Result	Effluent pH Result	Effluent Dissolved Oxygen (mg/L)
GSA OU				
CGSA GWTS	**01/21/2009**	**7**	**7**	**NR**
CGSA GWTS	**02/04/2009**	**NA**	**7**	**NR**
CGSA GWTS	**03/03/2009**	**NA**	**7**	**NR**
CGSA GWTS	**04/08/2009**	**7**	**7.2**	**NR**
CGSA GWTS	**05/05/2009**	**NA**	**7.2**	**NR**
CGSA GWTS	**06/09/2009**	**NA**	**7.2**	**NR**
Building 834 OU				
834 GWTS	**01/13/2009**	**7.94**	**8.04**	**NR**
834 GWTS	**02/02/2009**	**NA**	**7.84**	**NR**
834 GWTS	**03/02/2009**	**NA**	**7.88**	**NR**
834 GWTS	**04/06/2009**	**8**	**7.82**	**NR**
834 GWTS	**05/06/2009**	**NA**	**7.91**	**NR**
834 GWTS	**06/08/2009**	**NA**	**7.9**	**NR**
HEPA OU				
815-SRC GWTS	**01/07/2009**	**7**	**7**	**NR**
815-SRC GWTS	**02/03/2009**	**NA**	**7**	**NR**
815-SRC GWTS	**03/03/2009**	**NA**	**7.54**	**NR**
815-SRC GWTS	**04/06/2009**	**7.73**	**7.35**	**NR**
815-SRC GWTS	**05/05/2009**	**NA**	**7.57**	**NR**
815-SRC GWTS	**06/08/2009**	**NA**	**7.13**	**NR**
815-PRX GWTS	**01/31/2009**	**NA**	**NA**	**NR**
815-PRX GWTS	**02/11/2009**	**7**	**7**	**NR**
815-PRX GWTS	**03/03/2009**	**NA**	**7.82**	**NR**
815-PRX GWTS	**04/06/2009**	**7.91**	**7.77**	**NR**
815-PRX GWTS	**05/05/2009**	**NA**	**7.65**	**NR**
815-PRX GWTS	**06/08/2009**	**NA**	**7**	**NR**
815-DSB GWTS	**01/12/2009**	**7**	**7**	**NR**
815-DSB GWTS	**02/04/2009**	**NA**	**7**	**NR**

A-1. Results of infuent and effluent pH, and effluent dissolved oxygen monitoring, January through June 2009.

Sample Location	Sample Date	Influent pH Result	Effluent pH Result	Effluent Dissolved Oxygen (mg/L)
815-DSB GWTS	03/03/2009	NA	7	NR
815-DSB GWTS	04/07/2009	7	7	NR
815-DSB GWTS	05/05/2009	NA	7	NR
815-DSB GWTS	06/09/2009	NA	7	NR
817-SRC GWTS	01/31/2009	NA	NA	NR
817-SRC GWTS	02/25/2009	6.5	7	NR
817-SRC GWTS	03/03/2009	NA	7.76	NR
817-SRC GWTS	03/31/2009	8.23	8.05	NR
817-SRC GWTS	05/05/2009	NA	8.02	NR
817-SRC GWTS	06/08/2009	NA	8.1	NR
817-PRX GWTS	01/31/2009	NA	NA	NR
817-PRX GWTS	02/28/2009	NA	NA	NR
817-PRX GWTS	03/11/2009	7.86	7.44	NR
817-PRX GWTS	04/06/2009	7.96	7.42	NR
817-PRX GWTS	05/05/2009	NA	7.85	NR
817-PRX GWTS	06/08/2009	NA	7.47	NR
Building 854 OU				
854-SRC GWTS	01/12/2009	7	7	NR
854-SRC GWTS	02/03/2009	NA	7	NR
854-SRC GWTS	03/03/2009	NA	7	NR
854-SRC GWTS	04/06/2009	7	7	NR
854-SRC GWTS	05/04/2009	NA	7	NR
854-SRC GWTS	06/08/2009	NA	7	NR
854-PRX GWTS	01/29/2009	NM	7	NR
854-PRX GWTS	02/03/2009	NA	7	NR
854-PRX GWTS	03/03/2009	NA	7	NR
854-PRX GWTS	04/06/2009	7	7	NR
854-PRX GWTS	05/04/2009	NA	7	NR
854-PRX GWTS	06/08/2009	NA	7	NR

A-1. Results of infuent and effluent pH, and effluent dissolved oxygen monitoring, January through June 2009.

Sample Location	Sample Date	Influent pH Result	Effluent pH Result	Effluent Dissolved Oxygen (mg/L)
854-DIS GWTS	**01/31/2009**	**NM**	**NA**	**NR**
854-DIS GWTS	**02/24/2009**	**NA**	**7**	**NR**
854-DIS GWTS	**03/03/2009**	**NA**	**7**	**NR**
854-DIS GWTS	**04/07/2009**	**7**	**7**	**NR**
854-DIS GWTS	**05/04/2009**	**NA**	**7**	**NR**
854-DIS GWTS	**06/08/2009**	**NA**	**7**	**NR**
832 Canyon OU				
832-SRC GWTS	**01/13/2009**	**7.73**	**7.78**	**NR**
832-SRC GWTS	**02/02/2009**	**NA**	**7.68**	**NR**
832-SRC GWTS	**03/02/2009**	**NA**	**7.44**	**NR**
832-SRC GWTS	**04/06/2009**	**7.78**	**7.43**	**NR**
832-SRC GWTS	**05/31/2009**	**NA**	**NA**	**NR**
832-SRC GWTS	**06/30/2009**	**NA**	**NA**	**NR**
830-SRC GWTS	**01/13/2009**	**8.24**	**7.08**	**NR**
830-SRC GWTS	**02/02/2009**	**NA**	**7.48**	**NR**
830-SRC GWTS	**03/02/2009**	**NA**	**7.45**	**NR**
830-SRC GWTS	**04/06/2009**	**7.64**	**7.3**	**NR**
830-SRC GWTS	**05/06/2009**	**NA**	**7.13**	**NR**
830-SRC GWTS	**06/08/2009**	**NA**	**7.24**	**NR**
830-DISS GWTS	**01/13/2009**	**7**	**7**	**NR**
830-DISS GWTS	**02/04/2009**	**NA**	**7**	**NR**
830-DISS GWTS	**03/03/2009**	**NA**	**7**	**NR**
830-DISS GWTS	**04/07/2009**	**7**	**7**	**NR**
830-DISS GWTS	**05/05/2009**	**NA**	**7**	**NR**
830-DISS GWTS	**06/09/2009**	**NA**	**7**	**NR**

Notes appear on the following page.

A-1. Results of infuent and effluent pH, and effluent dissolved oxygen monitoring, January through June 2009.

Sample Location	Sample Date	Influent pH Result	Effluent pH Result	Effluent Dissolved Oxygen (mg/L)

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

Appendix B

Building 834 T2 *In Situ* Bioremediation Monitoring Data

B-1. Results of light hydrocarbon monitoring for the Building 834 T2 Area bioremediation treatability Study.

Sample Location	Sample Date	Ethane (μg/L)	Ethene (μg/L)	Methane (μg/L)
W-834-1825	3/2/09	0.24	87	10,000
W-834-1825	5/19/09	0.3	180	10,000
W-834-1833	3/2/09	0.082	0.24	1.6
W-834-1833	5/19/09	0.048	0.4	6.9
W-834-T2	3/2/09	2.9	1,500	2,500
W-834-T2	5/19/09	3.6	1,300	8,300

Notes:

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

B-2. Results of oxygen-reduction potential (ORP) monitoring for the Building 834 T2 Area bioremediation treatability Study.

Date	W-834-1825 (mv)	W-834-1833 (mv)	W-834-T2 (mv)	W-834-T2A (mv)
1/4/09	-374	63.3	-485.2	-7
1/12/09	-377.4	61.9	-486.2	1.7
1/19/09	-377.4	63.4	-488.2	0.2
1/26/09	-375.1	64.6	-489.4	9.4
2/10/09	-375	58.6	-492.7	23.4
2/25/09	-373.5	61.7	-493.7	407.3
3/3/09	-365.1	63.6	-493.7	434.4
3/12/09	-383.5	324.3	-475.7	89.2
3/24/09	-391.4	348.9	-484.6	424
3/31/09	-391.9	316	-485.4	443.8
4/8/09	-389.6	-169.4	-486.8	447.9
4/16/09	-387.1	-221.9	-487.9	449.1
4/22/09	-386.4	-220.7	-488.6	452.3
4/29/09	-384.8	-207.5	-488.5	455.8
5/19/09	-380.9	-225.9	-487.9	468.2

Notes:

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

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