U. S. Department of Energy
Energy Technology Engineering Center
4100 Guardian Street, Suite 160
Simi Valley, CA 93063

June 4, 2018

Mr. Mark Malinowski
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826

Subject: 2018 Groundwater Level Monitoring Data

Dear Mark:

The attached report summarizes the United States Department of Energy (DOE) groundwater quarterly monitoring activities conducted during the second quarter (Q2) 2018 at Area IV within the Santa Susana Field Laboratory (SSFL), located in Ventura County, California. DOE chose to perform more robust sampling than what was required to take advantage of the winter precipitation that the area received in meeting our responsibilities as stated in the 2007 Consent Order. The Q2 2018 sampling activities met the objectives stated in the Site-Wide Groundwater Monitoring program and Site-Wide WQSAP except where noted above and in the body of this report. In general, sample results were consistent with historical results. Any newly detected sample results will be monitored in future sampling events. Areas of impact to groundwater from COCs remained consistent and will be further evaluated with the 2018 results to see if any changes are required.

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have questions or concerns, please give me a call at (805) 416-0992.

Best regards,

John Jones
DOE/ETEC, Director

CC: Roger Paulson, DTSC
Tom Seckington, DTSC
Laura Rainey, DTSC
Buck King, DTSC
Stephie Jennings, DOE
Brad Frazee, North Wind
John Wondolleck, CDM

Report on Quarterly Groundwater Monitoring, Area IV, First Quarter 2018

Santa Susana Field Laboratory Ventura County, California

Prepared for:
United States Department of Energy

Prepared by:
North Wind, Inc.

June 2018

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Report on Quarterly Groundwater Monitoring, Area IV, First Quarter 2018

Santa Susana Field Laboratory Ventura County, California

June 2018

Prepared for:
United States Department of Energy
4100 Guardian Street, Suite 160
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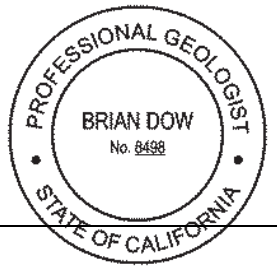
PROFESSIONAL CERTIFICATION

Report on Quarterly Groundwater Monitoring, Area IV
First Quarter 2018
Santa Susana Field Laboratory
Ventura County, California

June 2018

This Quarterly Groundwater Monitoring Report has been prepared by a team of qualified professionals under the supervision of the senior staff whose seal and signature appears below.

Reviewed by
T. Stewart Williford
ETEC Manager



Prepared by
Brian Dow, PG, PMP
Principal Geologist

Approved by
Brad Frazee
Project Manager

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Executive Summary

This report summarizes the United States Department of Energy (DOE) groundwater quarterly monitoring activities conducted during the first quarter (Q1) 2018 at Area IV within the Santa Susana Field Laboratory (SSFL), located in Ventura County, California. The quarterly report has been developed by North Wind, Incorporated, (North Wind) and includes water quality data collected from administrative Area IV, Northern Buffer Zone, and off-site wells. For simplicity, data from these areas reported herein are referred to as "Area IV." DOE has gone above and beyond meeting the requirements in the Site-Wide Groundwater Water Quality Sampling and Analysis Plan (WQSAP) by including additional water quality samples in support of the Groundwater Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFI) Program (CDM Smith 2015a).

Groundwater samples were collected in Q1 2018 by North Wind. The following groundwater monitoring activities were conducted within Area IV, and are summarized in this report:

- Water quality samples were collected pursuant to the Site-Wide Groundwater Monitoring Program (Haley & Aldrich 2010b).
- Water quality samples were collected to support the RFI Program (CDM Smith 2015a).
- Scheduled 2018 samples were collected with the exceptions identified in this report.
- Water levels were measured in January of 2018 and groundwater elevation contours for 2018 were prepared and are presented in this report.
- Well maintenance was performed.

There are no Regulated Unit or Post-Closure Permit (PCP) monitoring program requirements for Area IV.

Exceptions to the Site-Wide Groundwater WQSAP are summarized in this report. Water supply well WS-07 was sampled by NASA as part of its groundwater investigation work.

Exceptions Noted during the 2018 First Quarter Sampling

Exceptions to the Site-Wide WQSAP included wells that could not be sampled due to being dry; wells containing insufficient water for sampling; or a well obstruction due to partially removed Flexible Liner Underground Technologies (FLUTe) devices. Stabilization readings for some wells were recorded at intervals greater than five minutes based on the time requirement to exchange water in the flow-through cell due to the low flow rate. For two wells, the low-flow stabilization criterion was not met based on the water level drawdown exceeding 0.3 feet.

A groundwater sample was collected from RD-34B using a pump placed immediately above the existing borehole obstruction (167 feet below ground surface), and low-flow sampling procedures were followed.

A groundwater sample from RD-57 could not be obtained due to a downhole obstruction caused by a partially removed FLUTe sampling device. The lid on this well has been welded shut to restrict access.

Reporting limits for all analytes were met except for vinyl chloride, 1,2-dichloroethane (1,2-DCA), carbon tetrachloride, and gasoline-range organics (GRO). These differences are discussed in detail in Section 3.4 and are considered sufficient to meet project requirements.

Sample Results Evaluation

Section 4.2 presents the analytes reported in the wells sampled during Q1 2018. The data presentation is grouped into three categories based on whether (1) was there new analyses conducted at that well, (2) an analyte was reported for the first time in a well and that concentration is now the new maximum value, or (3) the analyte has been detected in the well previously but the new value is now the new maximum concentration.

For the first category, no new analytical methods were performed on samples from existing wells.

For the second category, various analytes were reported for the first time in multiple wells sampled during Q1 2018 and these concentrations are now the new maximum values for those wells and analytes. All radionuclides detected for the first time in various wells were below the SSFL screening criteria. New maximum concentrations in this category above the associated SSFL screening criteria values include:

- GROs in wells DD-141, PZ-105, and RD-54A; and
- Diesel-range organics (DRO) in wells DD-54A and RD-63.

For the third category, various analytes were reported in different wells sampled in Q1 2018. These results are not first time detects but they are now the new maximum values for these analytes and these wells. New maximum values for previously detected analytes exceeding the associated SSFL screening criteria values include:

- 1,1-dichloroethene (1,1-DCE) in well RD-23;
- 1,4-dioxane in well DS-46;
- DRO in wells PZ-105, RD-14, and RD-96;
- Trans-1,2-dichloroethene in well RD-65;
- Trichloroethylene in wells C-8, DD-144, and RD-23;
- Total gross alpha in wells DD-141 and RD-63; and
- Strontium 90 in well RD-98.

Analytes that were above any associated SSFL screening criteria in a particular well will be sampled in 2019. New first time detected analytes will also be sampled for in 2019. The 2018 annual report will address the Q1 2018 results, and their contribution to current groundwater trends and whether new areas of impact are identified.

Conclusions

The Q1 2018 sampling activities met the objectives stated in the Site-Wide Groundwater Monitoring program and Site-Wide WQSAP except where noted above and in the body of this report. In general, sample results were consistent with historical results. Any newly detected sample results will be monitored in future sampling events. Areas of impact to groundwater from contaminants of concern (COCs) remained consistent and will be further evaluated with the 2019 results to see if any changes are required.

CONTENTS

FIGURES

TABLES

ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
1,2,3-TCP	1,2,3-trichloropropane
1,2-DCA	1,2-dichloroethane
22 CCR	Title 22 California Code of Regulations
Boeing	The Boeing Company
CDM Smith	CDM Federal Programs
cis-1,2-DCE	cis-1,2-dichloroethene
COC	contaminant of concern
DOE	United States Department of Energy
DPH	Department of Public Health
DQI	data quality indicator
DQO	data quality objective
DRO	diesel-range organic
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
ESADA	Empire State Atomic Development Authority
ETEC	Energy Technology Engineering Center
FLUTe	Flexible Liner Underground Technologies
FSDF	Former Sodium Disposal Facility
GRO	gasoline-range organic
GWIM	groundwater interim measure
GWRC	Groundwater Resources Consultants
ICP	inductively coupled plasma
ID	identification
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LUFT	Leaking Underground Fuel Tank
MCL	maximum contaminant level
MDL	method detection limit
mg/L	milligrams per liter

mrem/yr	millirems per year
MS	matrix spike
MSD	matrix spike duplicate
MSL	mean sea level
MWH	Montgomery Watson Harza
NASA	National Aeronautics and Space Administration
NDMA	n-nitrosodimethylamine
North Wind	North Wind, Inc.
PCE	tetrachloroethene
pCi/L	picoCuries per liter
PCP	Post-Closure Permit
Q1	first quarter
QC	quality control
RBSL	risk-based screening level
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RL	reporting limit
RMHF	Radioactive Materials Handling Facility
RI	Remedial Investigation
RPD	relative percent difference
RWQCB	Regional Water Quality Control Board
SDG	sample delivery group
SMCL	Secondary Maximum Contaminant Level
SNAP	Systems Nuclear Auxiliary Power (Facility)
Sr-90	strontium-90
SSFL	Santa Susana Field Laboratory
SWGW RBSL	site-wide groundwater risk-based screening level
TCE	trichloroethene
trans-1,2-DCE	trans-1,2-dichloroethene
U	uranium
U-233/234	uranium-233/234
U-238	uranium-238
VC	vinyl chloride
VOC	volatile organic compound
WQSAP	Water Quality Sampling and Analysis Plan

Report on Quarterly Groundwater Monitoring, Area IV, First Quarter 2018

Santa Susana Field Laboratory Ventura County, California

1. INTRODUCTION

This report summarizes the groundwater monitoring activities conducted during the first quarter (Q1) 2018 by the United States Department of Energy (DOE) within Area IV of the Santa Susana Field Laboratory (SSFL) located in Ventura County, California (Figure 1). This report combined with reports developed by The Boeing Company (Boeing) and the National Aeronautics and Space Administration (NASA) constitute the reporting requirements for SSFL. DOE is submitting data for wells within Area IV for which it has responsibility under the 2007 Consent Order for Corrective Action (Department of Toxic Substance Control [DTSC] 2007). This report describes groundwater monitoring activities that occurred during Q1 2018 within administrative Area IV, the Northern Buffer Zone, and off-site wells located to the north and west of Area IV. For simplicity, administrative Area IV, Northern Buffer Zone, and off-site wells associated with Area IV are termed "Area IV" in this report.

This report contains Area IV information relative to DOE activities only. There are no Post-Closure Permit (PCP) Regulated Unit Monitoring Program requirements or Leaking Underground Fuel Tank (LUFT) requirements for Area IV.

Area IV groundwater monitoring activities described in this report were the result of implementation of the December 2010 Site-Wide Water Quality Sampling and Analysis Plan (WQSAP; Haley & Aldrich 2010b), and site-wide activities in support of the DOE Area IV Groundwater Resource Conservation and Recovery Act (RCRA) Facility Investigations (RFI) Program (CDM Smith 2015a).

1.1 Site Description

The SSFL is located approximately 29 miles northwest of downtown Los Angeles, California, in the southeast corner of Ventura County (Figure 1). The SSFL occupies approximately 2,850 acres of hilly terrain, with approximately 1,100 feet of topographic relief near the crest of the Simi Hills. Figure 1 shows the geographic location and property boundaries of the site, as well as surrounding areas. The site is divided into four administrative areas (Areas I, II, III, and IV) and includes undeveloped land both to the north and south. Most of Area I and all of Areas III and IV are owned by Boeing. The United States Environmental Protection Agency (EPA) Identification Number for Areas I and III is CAD093365435. Area II is owned by the federal government and administered by NASA along with a portion of Area I. The EPA Identification Number for Area II is CA1800090010. Boeing owns the entirety of Area IV. The EPA Identification Numbers for Area IV are CAD000629972 and CA389009001. Ninety acres of Area IV were leased to the DOE, which also owns facilities in Area IV. The northern and southern undeveloped lands of SSFL were not used for industrial activities and are owned by Boeing.

1.2 Regulatory Background

Prior to submission of this quarterly report, groundwater sampling activities for Area IV were reported along with results from Areas I, II, and III. As a result, some historical groundwater monitoring reports

were intended to fulfill the requirements of multiple regulatory programs being implemented at SSFL. These include requirements addressed in the PCP monitoring programs (Regulated Unit Programs) for Areas I, II, and III approved by the California EPA DTSC, the Site-Wide Groundwater Monitoring Program approved by DTSC, and LUFT monitoring program overseen by DTSC. There are no Regulated Unit or LUFT requirements for Area IV and thus they are not addressed in this document.

The content of this report is in compliance with the December 2010 Site-Wide WQSAP (Haley & Aldrich 2010b). The Site-Wide Groundwater Monitoring Program is prescribed by the Site-Wide WQSAP.

1.3 Objectives

Area IV groundwater compliance requirements are presented in the Site-Wide Groundwater Monitoring Program. The objective of this report is to document compliance with that program. The scope of this report includes the following:

- Executive summary of significant findings;
- Summary of monitoring programs and activities conducted during the calendar year;
- Summary of maintenance inspections of monitored wells;
- Summary of modifications made to monitoring equipment during the calendar year, if any;
- Summary of deviations from the Site-Wide WQSAP, if any;
- Discussion of significant events that may influence the occurrence and movement of groundwater;
- Summary of results of laboratory analyses of water samples;
- Summary tables indicating monitoring parameter results that lie outside of historical range for each monitoring location;
- Summary of constituent concentrations at wells that exceed SSFL groundwater screening reference values (SSFL screening criteria);
- Summary of outstanding issues and/or follow-up work; and
- Results of quality assurance/quality control sampling and analysis and assessment of data quality including accuracy, precision, and completeness with associated laboratory and data validation reports.

1.4 Report Organization

The remainder of this report is organized as follows:

- Section 2 provides a description of the site geology and hydrogeology.
- Section 3 provides a summary of the activities performed during this reporting period.
- Section 4 presents the results of field work and analytical testing.
- Section 5 presents planned activities for 2019.
- Section 6 provides references.

2. SITE GEOLOGY AND HYDROGEOLOGY

2.1 Geology

The SSFL is located in the Western Transverse Ranges physiographic province of southern California. The province's geology and physiography reflect at least 70 million years of geologic history. The sedimentary rocks in the portion encompassing SSFL range from coarse-grained conglomerates and sandstones to fine-grained siltstones and shale. The geologic history of the Western Transverse Ranges is complex and involves several distinct episodes of deformation involving tectonic extension, rotation, compression, and shearing. In the vicinity of SSFL, this has caused the Western Transverse Ranges to rotate more than 90 degrees clockwise. This complex geologic history is reflected in multiple fold, fault, and fracture orientations in the vicinity of SSFL.

The Chatsworth Formation underlies much of the province and is exposed across most of SSFL (Figure 2). It is a turbidic sandstone with interbedded shale, siltstone, and conglomerate approximately 6,000 feet thick and more than 65 million years old. As a result of geologic folding, the Chatsworth Formation dips moderately (typically 25 to 35 degrees) to the northwest at SSFL, along the south limb of the Simi Valley syncline. Detailed geologic mapping in the site vicinity was performed to augment published geologic maps, resulting in the subdivision of the Chatsworth Formation into upper and lower units (Montgomery Watson Harza [MWH] 2009). The lower formation is exposed in southeastern SSFL and dips northwest beneath the remainder of the site. The upper Chatsworth Formation is exposed across much of the remainder of the site and has been subdivided further into stratigraphic packages consisting of coarse- and fine-grained members. Numerous steeply dipping to near-vertical faults offset this stratigraphy. Fault gouge and fracturing, ancillary to faults, are observed at some locations.

Unconsolidated deposits at SSFL include alluvium, artificial fill, and thin soils over bedrock. The alluvium generally consists of silty sand and occurs in topographic lows and along ephemeral drainages. Areas with 5 to 30 feet of alluvium cover more than 300 acres of SSFL, or about 11 percent of the site.

Groundwater occurs at SSFL in alluvium and weathered and unweathered bedrock (Montgomery Watson 2000; MWH 2009). First-encountered groundwater may be observed in any of these media under water table conditions. For regulatory purposes, near-surface groundwater is defined to occur within the site's unconsolidated deposits (e.g., alluvium) and shallow weathered bedrock, whereas deep groundwater, referred to as "Chatsworth Formation groundwater," occurs in the unweathered bedrock. The near-surface groundwater may be perched or vertically continuous with deeper groundwater.

The boundaries of the mountain groundwater system encompassing SSFL include where the Simi Hills meet the floor of the Simi and San Fernando valleys, and where groundwater tends to discharge to seeps and phreatophytes along several surrounding canyons. The base of the active groundwater flow system occurs at the boundary between fresh and connate groundwater, assumed to occur at approximately sea level. The upper boundary of the mountain groundwater flow system is the regional water table and localized perched water tables. Hydrogeologic boundaries internal to the groundwater flow system include areas of groundwater discharge to seeps and phreatophytes, pumped wells, and various boundary effects along faults and geologic contacts.

Portions of the Chatsworth Formation comprise locally transmissive aquifer units. These units generally consist of the fractured sandstone members of the upper Chatsworth Formation, many of which are several hundred feet thick. Separating the major sandstone units are a series of relatively thin shale and siltstone members that typically behave as aquitards.

The arrangement and geometry of the hydrogeologic units are controlled by geologic contacts, folding, and faulting. Faults truncate permeable zones and fractures, juxtapose different units and fold orientations, and form low-permeability boundaries and zones of enhanced fracturing. Together, these structures result in a complex three-dimensional distribution of hydrogeologic units and anisotropic permeability that influence directions and rates of groundwater flow. Major faults subdivide SSFL into several large blocks, which are further subdivided by shale beds.

The SSFL water table is a subdued reflection of the topography, which, relative to the surrounding valleys, presents as a large groundwater mound that is maintained by rainfall recharge. Distinct differences in groundwater head are observed across fine-grained units and faults that impede groundwater flow. Groundwater moves from areas of recharge toward pumping wells and downward and outward toward hill slope seeps and the surrounding lowlands. The direction of vertical flow is downward at most site locations. Insight into the pattern of SSFL groundwater flow has been provided through the development and use of a representative three-dimensional groundwater flow model (MWH 2017).

3. REPORTING PERIOD ACTIVITIES

The reporting period for this report covers from January 1, 2018, to March 31, 2018. Groundwater samples were collected from February 19, 2018, through March 2, 2018, as part of the Area IV Site-Wide Groundwater Monitoring Program and to support the DOE Groundwater RFI Program.

The Site-Wide Groundwater Monitoring Program – December 2010 Site-Wide WQSAP (Haley & Aldrich 2010b) was implemented to fulfill the groundwater monitoring program specific to Area IV at SSFL.

The following activities stipulated by the Site-Wide WQSAP were conducted during the reporting period:

- Measurement of groundwater levels at all accessible program wells.
- Collection and submission of groundwater samples from select wells for laboratory analysis.
- Data validation, data analysis, and database management.
- The activities of Groundwater RFI (CDM Smith 2015a) sampling conducted during Q1 2018 were:
- Collect water levels and groundwater samples from monitoring wells not sampled as part of the Site-Wide Groundwater Monitoring Program.
- Close remaining groundwater data gaps for existing wells through additional chemical analyses from those stated in the Site-Wide WQSAP.

All data collection activities reported herein were performed by North Wind under contract to DOE. Table 1 lists the wells present within Area IV during the sampling and associated sampling program, i.e., sampled under the WQSAP or sampled to address groundwater RFI data needs.

Well, piezometer, and seep locations are shown on Figure 3. The wells that are identified as Site-Wide Monitoring Program wells are highlighted on Figure 4.

North Wind completed field groundwater monitoring activities during Q1 of the 2018 reporting period. Field activities were conducted in general accordance with the Site-Wide WQSAP (Haley & Aldrich 2010b), with exceptions described in Section 3.4. Field personnel followed the sampling and analysis requirements described in the Site-Wide WQSAP.

Former Sodium Disposal Facility Groundwater Interim Measure (GWIM)

In November 2017, DOE initiated a groundwater interim measure at the Former Sodium Disposal Facility (FSDF). The objective of the GWIM is to remove contaminant mass for trichloroethene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA) associated with near-surface bedrock fractures (about 30 feet below ground surface). At the start of groundwater pumping using well RS-54, the TCE concentration was 1,300 micrograms per liter (µg/L), 1,1-dichloroethene (1,1-DCE) (a breakdown product of TCE) was 2,700 µg/L, 1,1,1,-TCA was 11,000 µg/L, and 1,2-dichloroethane (1,2-DCA) was 2,300 µg/L.

The GWIM action involves pumping RS-54 dry and sampling the purge water during sampling. The well is typically pumped dry using low flow procedures within 20 minutes. The well is then allowed to recover before the next pumping event.

The GWIM action was continued during Q1 of 2018. Well RS-54 was pumped 10 times from January 2 to March 19, 2018. Well recharge and recovery were much slower than the previous pumping events

during Q1, with pumping mostly occurring on a weekly basis. A total of 115 gallons were pumped during Q1. There has been no appreciable reduction in chlorinated volatile organic compound (VOC) concentrations over the period of pumping. Since November 2017, approximately 15 total grams of chlorinated VOCs have been removed from the near-surface bedrock fractures.

3.1 Modifications to Well Network and Equipment

Wells and piezometers were inspected during Q1 2018. Well maintenance needs were noted and either completed or are pending approval of recommended actions. Table 2 presents well maintenance, equipment modifications, well construction, and well development activities performed on Area IV wells and piezometers during Q1 2018. No new Area IV wells were installed, developed, or sampled during Q1 2018.

3.2 Water Level Gauging

Area IV static water levels were gauged at all accessible program wells. Depths to water were measured from the top of each well casing. Conditions of the well (e.g., loose caps, damaged casing) were recorded in field logs. Wells were gauged using an electronic water-level meter. Portions of the cable and meter or probe that were in contact with groundwater were decontaminated before use at each well. Water levels were obtained during Q1 2018 and are summarized in Table 3.

Water supply well WS-07 was not gauged. Gauging of WS-07 may be performed by NASA and/or Boeing in the future.

3.3 Groundwater Sampling and Analysis

Area IV monitoring wells are scheduled to be sampled annually in accordance with the Site-Wide WQSAP. The Area IV Site-Wide Groundwater Monitoring Program includes 66 wells that are included in the Site-Wide Water Level Monitoring Program. Of those 66 wells, 30 wells are included for sampling under the Site-Wide Sampling Program. An additional 55 wells are subject to groundwater sampling under the RFI Program. A total of 45 DOE wells were scheduled to be sampled during Q1 2018. Of those 45, three wells (PZ-097, PZ-124, RS-18) were dry, one well (RD-30) had a pump malfunction, and one well (RD-57) has been welded shut. A total of 17 Site-wide wells and 23 RFI wells were sampled.

The locations of the wells, piezometers, and seeps are presented on Figure 3. The Site-Wide Groundwater Monitoring Program wells are presented in Table 1 and shown on Figure 4. Wells that could not be sampled in Q1 2018 and the associated reasons are discussed in Table 4. Groundwater field parameters collected during purging, prior to sample collection, are presented in Table 5. Table 6 and 7 present the analytical results and methods, respectively..

3.4 Deviations from Water Quality Sampling and Analysis Plans

Exceptions to the Site-Wide WQSAP (Haley & Aldrich 2010b) are presented in Table 4. Exceptions included wells that could not be sampled due to being dry; wells containing insufficient water for sampling; and a well obstruction caused by a partially removed Flexible Liner Underground Technologies (FLUTe) multi-level sampling system.

Stabilization readings for some wells were collected at intervals greater than five minutes based on giving enough time to exchange water in the flow-through cell due to the flow rate. For two wells, low-flow stabilization criteria were not met based on the water level drawdown exceeding 0.3 feet.

Due to an obstruction in well RD-34B, the groundwater sample from this well was collected using a pump placed immediately above the obstruction (167 feet below ground surface) and low-flow sampling procedures were followed.

The reporting limit for vinyl chloride, 1 microgram per liter (µg/L), was above the SSFL groundwater screening level reference value (SSFL screening criteria) maximum contaminant level (MCL) criterion of 0.5 µg/L. The method detection limit (MDL) was 0.10 µg/L, however, and all sample results were nondetect so the 1 µg/L reporting limit is considered sufficient for project purposes. The reporting limit was also elevated for 1,2,-DCA at 1 µg/L (MDL = 0.13 µg/L) whereas the MCL criterion is 0.5 µg/L. The reporting limit for carbon tetrachloride was also above the SSFL screening criterion MCL of 0.5 µg/L at 1 µg/L. The MDL was 0.19 µg/L, which is below the criterion. If results are detected between the MDL and reporting limit they are reported as detected estimated results. Also, there were instances where the reporting limits for these analytes were elevated due to laboratory dilutions necessary to remain within instrument calibration limits when high concentrations of other target analytes were encountered. All these sample reporting limits are considered sufficient and meet project requirements.

The reporting limit for gasoline-range organics (GRO) is above the taste/odor threshold of 5 µg/L for the SSFL screening criteria. The reporting limit from the December 2010 Site-Wide WQSAP (Haley & Aldrich 2010b) is 50 µg/L. The laboratory had a reporting limit of 25 µg/L and an MDL of 10 µg/L. The reporting limit and MDL values are both below the WQSAP stated reporting limit. Based on professional judgment the 25 µg/L reporting limit is adequate for project purposes.

No exceptions other than those listed in Table 4 occurred for Area IV wells during 2018.

4. MONITORING RESULTS

This section provides a review of Area IV Q1 2018 groundwater levels, and groundwater quality results and trends. Historical data were summarized in previous reports by:

- Groundwater Resources Consultants (GWRC 2000);
- Haley & Aldrich (2001 through 2010a);
- MWH (2011a, 2011b, 2012, 2013, 2014);
- CDM Smith (2015b, 2016a, 2016b, 2016c); and
- North Wind (2017, 2018).

Groundwater screening reference values used to evaluate results are presented in Table 8. First-time detections of analytes and new historical maximum results are presented in Table 9.

4.1 Groundwater Elevations and Flow Conditions

Groundwater elevations measured in SSFL Chatsworth Formation monitoring wells during Q1 2018 ranged from a low of approximately 1,314 feet above mean sea level (MSL) at well RD-59A to a high of about 1,793 feet above MSL at well RD-17 (Table 3, Figure 5). The perched zone elevations ranged from a low of 1,788 feet above MSL at PZ-108 to a high of 1,806 feet above MSL at RS-54. There were no groundwater extraction events (including the GWIM at RS-54) that are believed to have influenced the presence or movement of groundwater in Area IV.

Figure 5 presents contours of first-encountered, non-perched groundwater elevations, as determined from water levels measured during the Q1 2018. Additional information that helped constrain the contouring included topography, the approximate elevations of identified seeps, historical water level data for wells and piezometers not gauged during 2018, and the understanding that groundwater level discontinuities coincide with certain fault segments and other geologic structures. In the case of well clusters, water levels from the shallowest wells were used. The data represent water levels primarily within the Chatsworth Formation, but include levels in younger deposits where the zone of saturation is continuous with the underlying formations.

The groundwater elevation contour map is provided to satisfy, in part, the requirements of Title 22 California Code of Regulations (22 CCR), Section 66264.97, for determining groundwater flow rates and directions. A groundwater elevation contour map can be used in simple hydrogeologic settings to depict variations in the elevation of the water table surface, which can in turn be used to interpret apparent relative directions of groundwater flow. However, the groundwater elevation contours depicted in Figure 5 are not used to infer groundwater flow directions or rates of groundwater movement due to the hydrogeologic complexities at SSFL as described in Section 2.2. Mountain-scale estimates of groundwater flow rates and three-dimensional groundwater flow directions from areas within SSFL were made and are presented in the draft groundwater RI report (MWH 2009). While DOE acknowledges the significant effort that has been spent calibrating the mountain-scale model, DOE believes that the model does not characterize the flow paths in Area IV with sufficient accuracy to make important investigation and remediation decisions. As part of the RFI Program, local-scale flow and transport modeling is currently being performed for DOE by Dr. Scott James of Baylor University and Dr. Bill Arnold to reflect Area IV conditions (CDM Smith 2017)

4.2 Groundwater Quality

Laboratory analytical results for groundwater samples are tabulated in Tables 10 through 15. Constituents detected for the first time in groundwater sampled from individual locations are presented in Table 9. Constituents previously detected in groundwater sampled from a particular location and reported at new maximum concentrations are also presented in Table 9. Aside from these exceptions, the analytical results were within historical ranges (GWRC 2000; Haley & Aldrich 2001 through 2010a; MWH 2003, 2011a, 2011b, 2012, 2013, 2014) and 2014, 2015, 2016, and 2017 Annual Reports (CDM Smith 2015b, 2016d; North Wind 2017, 2018).

4.2.1 Quality Assurance and Quality Control

Based on the quality of all results considered, completeness goals were found to be met with the data for Q1 2018 suitable for the intended uses (Appendix A). Per the Site-Wide WQSAP (Haley & Aldrich 2010b), the quality assurance assessment provides an assessment of data quality, including precision, accuracy, representativeness, comparability, completeness, and sensitivity. The quality assurance assessment also includes results of the data validation process, and a summary of the field sampling and analytical program, data management review procedure, and data verification process.

4.2.2 Groundwater Screening Reference Values

The groundwater sampling results for individual chemicals are compared for discussion purposes to the following screening values, listed in approximate descending order of importance and/or relevance:

- Site-specific values developed by DTSC (i.e., groundwater comparison concentrations for metals) (listed as SSFL Comparison in report tables);
- Isotope-specific activity limits for individual beta/photon emitters based on the effective dose equivalent of 4 millirems per year (mrem/yr) (Federal Register 2000);
- Primary MCLs established by the EPA and promulgated by the Safe Drinking Water Act, and by the California Department of Public Health (DPH) promulgated by 22 CCR, sections 64431 through 64449 and 64672 (Regional Water Quality Control Board [RWQCB] 2008; DPH 2008) (listed as Primary MCL and Cal MCL in report tables);
- Notification Levels/Advisory Levels established by the California DPH (RWQCB 2008; DPH 2010);
- Secondary maximum contaminant levels (SMCLs), which address aesthetics such as taste and odor (RWQCB 2008; DPH 2006) (listed as Secondary MCL in report tables);
- Taste and Odor Threshold (RWQCB 2008) (listed as Taste/Odor in report tables); and
- Site-specific values developed for SSFL using risk assessment procedures assuming direct ingestion of groundwater (listed as site-wide groundwater risk-based screening level [SWGW RBSL] in report tables).

For chemicals with more than one screening value, the lower value is used to be more conservative. When EPA and California DPH values for MCLs differ, the lower value is used. In cases where the SMCL is lower than the Primary MCL, the SMCL is used.

The methodology used to develop the risk-based screening values for chemicals that are not metallic elements and where there are no agency-published values is described in a technical memorandum

included in Appendix 7-C of the Groundwater RI Report (MWH 2009). Groundwater screening reference values are presented in Table 8.

4.2.3 Analytical Results

During the Q1 2018 sampling period, analytes in groundwater samples collected in Area IV that were detected for the first time at a particular well, and/or were analyzed for the first time, are shown in Table 9. Table 9 also shows whether the Q1 2018 detected result is a new maximum value for that analyte at that well. The following items depict the process of identifying the analytes shown in Table 9:

- Analytes that were detected for the first time in a well in Q1 2018.
- Analytes that were analyzed for the first time ever for that well (with an asterisk).
- Of these analytes, the detected values are compared to all data to see if the Q1 2018 value is the new maximum value for that well.

The few cases for which there are insufficient historical data to provide further context for the recent results, or that otherwise warrant further discussion, are presented below.

4.2.3.1 On-Site Detects

Constituent concentrations (except for radiochemical constituents, which are discussed separately in Section 4.2.4) detected in groundwater samples collected from on-site wells in Q1 2018 and presented in Table 9 are discussed below:

First-Time Analyses of an Analyte at a Particular Well

There were no new analytical suites included in the Q1 2018 sampling event.

First-Time Detection of the Analyte and New Maximum Value

As shown in Table 9, certain analytes were detected for the first time during Q1 2018 in various wells and those concentrations are also now the new maximum values for those analytes at these particular wells. New maximum concentrations in this category exceeding the associated SSFL screening criteria values include:

- GRO in wells DD-141, PZ-105, and RD-54A; and
- Diesel-range organics (DRO) in wells DD-54A and RD-63.

Not a First-Time Detect but Analyte Concentration is New Maximum Value

As shown in Table 9, certain analytes were detected as new maximum values in various wells during Q1 2018. Each detected concentration was not the first time each analyte was seen in the well but the value is now a new maximum concentration. New maximum values for previously detected analytes exceeding the associated SSFL screening criteria values include:

- 1,1-DCE in well RD-23;
- 1,4-dioxane in well DS-46;
- DRO in wells PZ-105, RD-14, and RD-96;
- Trans-1,2-dichloroethene in well RD-65; and

- Trichloroethylene in wells C-8, DD-144, and RD-23.

4.2.3.2 Off-Site Detections

Off-site wells sampled during Q1 2018 included RD-59A, RD-59B, and RD-59C. New maximum detections of dissolved boron, total iron, total manganese, molybdenum, strontium were detected in these wells at values orders of magnitude below screening levels. A new maximum of acetone was also detected orders of magnitude below the SSFL screening criterion in well RD-59A, and acetone was detected for the first time in well RD-59C. Since acetone interference is commonly introduced to samples from its use in laboratories, these detections may not be representative of environmental contamination.

4.2.4 Radiochemistry Results

Radiochemistry analyses were performed for samples collected during Q1 2018 reporting period under the Site-Wide and RFI programs and results are presented in Table 14 and discussed further below. Radiochemistry analyses included both total (non-filtered water) and dissolved (filtered water) results.

Radiochemistry analytes reported for the first time in groundwater at individual locations as well as any new maximum concentrations are presented in Table 9.

First-Time Analyses of an Analyte at a Particular Well

There were no new analytical suites included in the Q1 2018 sampling event.

First-Time Detection of the Analyte as well as the New Maximum Value

As shown in Table 9, total actinium-228, dissolved cobalt-57, total/dissolved Cobalt-60, total europium-152, total/dissolved europium-154, dissolved gross alpha, total/dissolved radium-226, total radium-228, dissolved sodium-22, dissolved strontium-90, total/dissolved uranium-233/234, total/dissolved uranium-235/236, and total/dissolved uranium-238 were reported for the first time in various wells and those concentrations are also now the new maximum values for those analytes at these particular wells. All radionuclides detected for the first time in various wells were below the SSFL screening criteria.

Not a First-Time Detect but Analyte Concentration is New Maximum Value

As shown in Table 9, total gross alpha/beta, total/dissolved radium-226, total/dissolved radium-228, strontium-90, total/dissolved uranium-233/234, and total/dissolved uranium-238 were reported as new maximum values in various wells during Q1 2018. Each reported concentration was not the first time each analyte was seen in the well but the value is now a new maximum concentration. New maximum values for previously detected analytes exceeding the associated SSFL screening criteria values include:

- Total gross alpha in wells DD-141 and RD-63; and
- Strontium 90 in well RD-98.

4.2.4.1 Off-Site Detections

Off-site wells sampled during Q1 2018 included RD-59A, RD-59B, and RD-59C. Dissolved cobalt-60, dissolved strontium-90, and total uranium-233/234 were detected for the first time at concentrations orders of magnitude below the screening levels. New maximums were detected below the SSFL

screening criteria for gross alpha in well RD-59C, dissolved uranium-233/234 in well RD-59A, and total uranium-238 in well RD-59A.

Due to the short radioactive half-lives of isotopes including cobalt-60, it is unlikely that they would be detected in these wells for the first time during 2018 considering that the source was shut down decades ago. Thus, some of these detections may be anomalous and will continue to be compared to future sample data to determine a trend, if any exists.

4.2.5 2017 Results Follow-up

This section evaluates whether or not sampling and analyses performed during Q1 2018 are sufficient to resolve documented follow-up sampling issues from the previous annual report (North Wind 2018), and assesses the need for changes to the groundwater monitoring programs.

4.2.5.1 2017 Outstanding Issues

A number of new maximum detections of cobalt-60 and sodium-22, radionuclides with short radioactive half-lives, were listed as detected during 2017. The source for these COCs was shut down decades ago. Based on comparison with 2018 sample data, total/dissolved sodium-22 were not detected again in wells where they were detected during 2017.

Vinyl chloride, carbon tetrachloride, 1,2-DCA, 1,4-dioxane, and GRO had 2017 reporting limits above the respective SSFL screening criteria in one or more samples. Similar reporting limits were used during Q1 2018 since the results are considered sufficient and meet the project requirements, as discussed in Section 3.4 and Table 4. The reporting limit of 1.0 µg/L was met for 1,4-dioxane during Q1 2018.

Silica gel cleanup was recommended to address uncertainty whether DRO detected in groundwater samples is from released petroleum or natural/biogenic sources. Silica gel cleanup was not used to prepare Q1 2018 DRO samples. It is recommended to prepare DRO samples using silica gel cleanup for one or more future sampling rounds.

The FSDF/ESADA area of impacted groundwater was reduced in 2014 due to concentrations below the SSFL screening criterion (notification level) of 1 µg/L for 1,4-dioxane in monitoring well RD-65 (0.46J µg/L). In 2013, RD-65 reported a concentration of 2.1 µg/L. Well RD-65 was not sampled for 1,4-dioxane in 2015, 2016, or 2017. RD-65 was sampled for 1,4-dioxane during Q1 2018 and was reported at an estimated concentration of 0.5J µg/L. This resolves the issues from the previous annual report and no additional change is necessary.

In 2016, 1,4-dioxane was detected above the SSFL screening criterion (notification level) of 1 µg/L in RD-33A at 1.8 µg/L, in DS-46 at 1.2 µg/L, and in DD-140 at 1.4J µg/L. These wells were not analyzed for 1,4-dioxane during 2017 or Q1 2018 and it is recommended to add 1,4-dioxane to the analyte list for future sampling rounds at these wells.

In 2017, 1,4-dioxane was not analyzed in RD-63. However, it was analyzed during 2016 and detected above the SSFL screening criterion (notification level) of 1 µg/L in RD-63 at 1.4 µg/L. It is recommended that 1,4-dioxane analysis be added for RD-63 for future sampling rounds.

During 2014, RD-23 had a DRO concentration of 17 mg/L, above the SSFL screening criterion (threshold criterion) for DRO. DRO was not sampled in well RD-23 during 2016, 2017, or Q1 2018. DRO analysis is recommended for one or more future sampling rounds at this well.

Wells RD-54A and RD-54B have never been sampled for GRO or DRO. It was previously recommended that RD54A be sampled for GRO/DRO, which was completed during Q1 2018. The DRO result was estimated at 58J µg/L and the GRO result was estimated at 57J µg/L. This resolves the issues from the previous annual report and no additional change is necessary.

The estimated concentration of nitrate was 39J mg/L for well RD-20 in 2014. This well was not sampled for nitrate in 2015, 2016,or 2017. It was previously recommended that RD-20 be sampled for nitrate, which was analyzed for during Q1 2018 with a result of 9.4 mg/L. This resolves the issues from the previous annual report and no additional change is necessary.

5. 2019 PLANNED ACTIVITIES

The monitoring frequency for the Site-Wide Program will be quarterly for water level monitoring and annually for sampling and analysis, with sampling to be performed in the first calendar quarter of 2019.

5.1 Outstanding Issues and/or Follow-Up Work

After review of the Q1 2018 sampling, some outstanding issues were identified and recommendations have been made for potential follow-up work. These are listed below based on rationale provided in Section 4.2.5.1.

- It is recommended to prepare DRO samples using silica gel cleanup for one or more future sampling rounds.
- It is recommended that results for radionuclides with short half-lives (including sodium-22 and cobalt-60) detected for the first time during 2018 (in various wells and below the SSFL screening criteria) be compared to 2019 data to provide an additional line of evidence that the detections are anomalies. It is unlikely that they would appear for the first time decades after the source was shut down.
- It is recommend to add sampling of the following for one or more future sampling rounds:
    - 1,4-dioxane from DD-140, RD-33A, RD-63, and RS-54; and
    - DRO from RD-23.

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TABLES

TABLE 1
LIST OF WELLS - SITE-WIDE GROUNDWATER MONITORING PROGRAM
AREA IV GROUNDWATER RFI
SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Well ID	Sampling Program[1]	Groundwater Impact Area	Water Level Monitoring Program	Well Sponsorship[2]	Location
C-08	RFI		W	DOE	FSDF
ES-31			W	Boeing	17th Street Pond
OS-02	S	13, 14, 16, 17	W	Boeing	Offsite
OS-03	S	13, 14, 16, 17	W	Boeing	Offsite
OS-04	S	13, 14, 16, 17	W	Boeing	Offsite
OS-05	S	13, 14, 16, 17	W	Boeing	Offsite
PZ-005	RFI			DOE	B65 Clarifier
PZ-041	RFI			DOE	PDU
PZ-051				Boeing	17th Street Pond
PZ-052				Boeing	Area III Boundary
PZ-055				Boeing	New Conservation Yard
PZ-097	S	17	W	DOE	FSDF
PZ-098	RFI			DOE	FSDF
PZ-100	RFI			DOE	FSDF
PZ-101	RFI			Boeing	ESADA
PZ-102				Boeing	B4009
PZ-103	RFI			DOE	B65 Clarifier
PZ-104	RFI			DOE	B65 Clarifier
PZ-105	RFI			DOE	B65 Clarifier
PZ-106				Boeing	Boeing Leachfield
PZ-107				Boeing	17th Street Pond
PZ-108	S	15	W	DOE	HMSA
PZ-109	RFI			DOE	B4057
PZ-110				Boeing	Area III Boundary
PZ-111				Boeing	Area III Boundary
PZ-112				Boeing	SE Drum Storage
PZ-113				Boeing	Area III Boundary
PZ-114				Boeing	New Conservation Yard
PZ-115				Boeing	New Conservation Yard
PZ-116	RFI			DOE	RMHF
PZ-120	RFI			DOE	HMSA
PZ-121	RFI			DOE	HMSA
PZ-122	RFI			DOE	PDU
PZ-124	S	16	W	DOE	B56 Landfill
PZ-150				Boeing	SRE
PZ-151				NASA	Area III Boundary
PZ-160				Boeing	SRE
PZ-161	RFI			Boeing	SRE
RD-07	S	16	W	DOE	B56 Landfill
RD-13	S	18	W	Boeing	Pond Dredge Area
RD-14	S	7	W	DOE	Old Conservation Yard
RD-15	RFI		W	Boeing	New Conservation Yard
RD-16			W	Boeing	SE Drum Storage
RD-17	RFI		W	DOE	B30/93 Leachfields
RD-18	S	13	W	Boeing	SRE
RD-19	S	13	W	DOE	B133
RD-20	S	18	W	DOE	B4100 Trench
RD-21	RFI		W	DOE	FSDF
RD-22	RFI		W	DOE	FSDF
RD-23	RFI		W	DOE	FSDF
RD-24	RFI		W	DOE	B4057
RD-27	RFI		W	DOE	RMHF
RD-29	RFI		W	DOE	PDU
RD-30	RFI		W	DOE	RMHF

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AREA IV GROUNDWATER RFI
SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Well ID	Sampling Program[1]	Groundwater Impact Area	Water Level Monitoring Program	Well Sponsorship[2]	Location
RD-33A	S	17	W	DOE	FSDF
RD-33B	S	17	W	DOE	FSDF
RD-33C	S	17	W	DOE	FSDF
RD-34A	S	13	W	DOE	RMHF
RD-34B	S	13	W	DOE	RMHF
RD-34C	S	13	W	DOE	RMHF
RD-50	S	17	W	Boeing	ESADA
RD-54A	S	17	W	DOE	FSDF
RD-54B	RFI		W	DOE	FSDF
RD-54C	RFI		W	DOE	FSDF
RD-57	S	17	W	DOE	FSDF
RD-59A	S	13, 14, 16, 17	W	DOE	Offsite
RD-59B	S	13, 14, 16, 17	W	DOE	Offsite
RD-59C	S	13, 14, 16, 17	W	DOE	Offsite
RD-63	S	13	W	DOE	RMHF
RD-64	RFI		W	DOE	FSDF
RD-65	RFI		W	DOE	FSDF
RD-74	RFI		W	DOE	B56 Landfill
RD-85	S	13	W	Boeing	SRE
RD-86	S	13	W	Boeing	SRE
RD-87	RFI		W	DOE	Tritium Plume
RD-88	RFI		W	DOE	Tritium Plume
RD-89	RFI		W	DOE	Tritium Plume
RD-90	RFI		W	DOE	Tritium Plume
RD-91			W	Boeing	B4100
RD-92			W	Boeing	New Conservation Yard
RD-93	RFI		W	DOE	Tritium Plume
RD-94	RFI		W	DOE	Tritium Plume
RD-95	RFI		W	DOE	Tritium Plume
RD-96	S	16	W	DOE	B4057
RD-97	RFI		W	DOE	B4057
RD-98	RFI		W	DOE	RMHF
RD-102				Boeing	SRE
RS-11			W	Boeing	17th Street Pond
RS-16	RFI		W	DOE	B56 Landfill
RS-18	S	17	W	DOE	FSDF
RS-23			W	Boeing	ESADA
RS-24			W	Boeing	SE Drum Storage
RS-25	RFI		W	DOE	B133
RS-27	RFI		W	DOE	PDU
RS-28	RFI		W	DOE	RMHF
RS-36				Boeing	SRE
RS-54	RFI		W	DOE	FSDF
WS-07			W	NASA/Boeing	Area III Boundary
DS-43	RFI			DOE	B57
DS-44	RFI			DOE	DOE Leachfield
DS-45	RFI				B4065 Leachfield
DS-46	RFI				Downgradient fo FSDF
DS-47	RFI			DOE	B64 Leachfield
DD-139	RFI			DOE	FSDF
DD-140	RFI			DOE	FSDF
DD-141	RFI				Toe of B56 landfill
DD-142	RFI			DOE	B57
DD-143	RFI				RMHF

TABLE 1
LIST OF WELLS - SITE-WIDE GROUNDWATER MONITORING PROGRAM
AREA IV GROUNDWATER RFI
SANTA SUSANA FIELD LABORATORY, VENTURA COUNTY, CALIFORNIA

Well ID	Sampling Program[1]	Groundwater Impact Area	Water Level Monitoring Program	Well Sponsorship[2]	Location
DD-144	RFI			DOE	HMSA
DD-145	RFI			DOE	DOE Leachfield
Seeps and Springs[3]					
					Nearest Impact Area
SP-900A				DOE	FSDF
SP-900B				DOE	FSDF
SP-900C				DOE	FSDF
SP-19A				DOE	Tritium Plume
SP-19B				DOE	Tritium Plume
SP-T02A				DOE	Tritium Plume
SP-T02B				DOE	Tritium Plume
SP-T02C				DOE	Tritium Plume
SP-T02D				DOE	Tritium Plume
SP-424A				DOE	RMHF
SP-424B				DOE	RMHF
SP-424C				DOE	RMHF

NOTES AND ABBREVIATIONS

S	Included in Site-Wide Sampling Program
W	Included in Site-Wide Water Level Monitoring Program
RFI	Collected as part of DOE Area IV GW RFI.

[1] Haley & Aldrich, 2010. Site-Wide Water Quality Sampling and Analysis Plan, Santa Susana Field Laboratory, Simi Hills, Ventura County, California, Revision 1, File No. 20090-456/556/656/M489. December.

[2] Well Sponsorship. On February 10, 2015, DOE and Boeing agreed to well sponsorship for First Quarter 2015 sampling. Modification to well sponsorship may occur prior to subsequent sampling events.

[3] Seeps and springs are monitored under a separate program.

TABLE 2
MODIFICATIONS TO MONITORING WELL NETWORK AND EQUIPMENT, FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

WELL MAINTENANCE

Well ID	Monitoring Program	Quarter Identified	Issue Identification Date	Issue	Issue Resolution	Quarter Resolved	Issue Resolution Date
RD-57	SW	2016Q1	3/10/2016	FLUTe was only partially removed due to an obstruction. Well cap wielded shut.	No planned action at this time.	--	--
RD-74	SW	2014Q1	2/4/2014	Obstruction at about 95 ft bgs due to pump left in well. Total well depth is 101 feet.	Issue discussed with DTSC in March 2016. Well is dry. No planned action at this time.	--	--

EQUIPMENT MODIFICATIONS

Well ID	Monitoring Program	Quarter	Modification Date	Description
None				

WELL CONSTRUCTION

Well ID	Monitoring Program	Quarter	Completion Date	Description
None				

WELL DEVELOPMENT

Well ID	Monitoring Program	Quarter	Development Date	Description
None				

Notes:

SW - Well monitored under Site-Wide Program
BTOC - below top of casing
bgs - below ground surface

TABLE 3
WATER LEVEL DATA, FIRST QUARTER 2018 - Area IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY CALIFORNIA

Well Identifier	Geological Unit	Reference Point Elevation (feet above MSL)	Date of Measurement	Depth to Water (feet BTOC)	Static Water Level Elevation (feet above MSL)	Notes
PZ-097	Shallow	1761.87	1/17/2018	Dry	---	
PZ-108	Shallow	1809.36	1/17/2018	21.35	1788.01	
PZ-124	Shallow	1764.11	1/18/2018	Dry	---	
RD-07	Chatsworth	1812.82	1/18/2018	100.29	1712.53	
RD-14	Chatsworth	1824.18	1/18/2018	109.14	1715.04	
RD-17	Chatsworth	1836.30	1/17/2018	43.60	1792.70	
RD-19	Chatsworth	1853.16	1/17/2018	91.11	1762.05	
RD-20	Chatsworth	1819.52	1/17/2018	50.85	1768.67	
RD-21	Chatsworth	1866.96	1/17/2018	105.97	1760.99	
RD-22	Chatsworth	1853.41	1/19/2018	298.62	1554.79	(1)
RD-23	Chatsworth	1838.19	1/19/2018	239.64	1598.55	(1)
RD-24	Chatsworth	1809.93	1/18/2018	46.97	1762.96	
RD-27	Chatsworth	1841.67	1/19/2018	62.11	1779.56	
RD-29	Chatsworth	1806.29	1/17/2018	20.08	1786.21	
RD-30	Chatsworth	1768.69	1/19/2018	22.70	1745.99	
RD-33A	Chatsworth	1792.97	1/18/2018	210.57	1582.40	(1)
RD-33B	Chatsworth	1793.72	1/18/2018	280.84	1512.88	
RD-33C	Chatsworth	1793.61	1/18/2018	282.94	1510.67	
RD-34A	Chatsworth	1761.91	1/19/2018	50.50	1711.41	
RD-34B	Chatsworth	1762.51	1/19/2018	61.90	1700.61	
RD-34C	Chatsworth	1762.79	1/19/2018	24.41	1738.38	
RD-50	Chatsworth	1914.88	1/18/2018	129.68	1785.20	(1)
RD-54A	Chatsworth	1841.72	1/19/2018	178.45	1663.27	
RD-54B	Chatsworth	1842.54	1/19/2018	242.88	1599.66	
RD-54C	Chatsworth	1843.77	1/19/2018	231.53	1612.24	
RD-57	Chatsworth	1774.15	1/18/2018	NA	---	(1)
RD-59A	Chatsworth	1340.59	1/17/2018	26.87	1313.72	(3)
RD-59B	Chatsworth Artesian	1342.49	1/17/2018	19 psi	---	(3)
RD-59C	Chatsworth Artesian	1345.41	1/17/2018	19 psi	---	(3)
RD-63	Chatsworth	1764.83	1/19/2018	37.48	1727.35	
RD-64	Chatsworth	1857.04	1/19/2018	249.92	1607.12	(1)
RD-65	Chatsworth	1819.14	1/19/2018	220.46	1598.68	
RD-74	Chatsworth	1810.90	1/17/2018	Dry	---	-4
RD-87	Chatsworth	1789.09	1/18/2018	54.69	1734.40	
RD-88	Chatsworth	1774.62	1/18/2018	Dry	---	
RD-89	Chatsworth	1814.18	1/18/2018	Dry	---	
RD-90	Chatsworth	1784.75	1/18/2018	45.17	1739.58	
RD-91	Chatsworth	1818.04	1/18/2018	99.56	1718.48	
RD-92	Chatsworth	1833.74	1/19/2018	73.42	1760.32	(3)
RD-93	Chatsworth	1810.48	1/18/2018	42.01	1768.47	
RD-94	Chatsworth	1744.38	1/18/2018	31.90	1712.48	
RD-95	Chatsworth	1811.36	1/18/2018	66.47	1744.89	
RD-96	Chatsworth	1805.09	1/18/2018	76.81	1728.28	
RD-97	Chatsworth	1792.22	1/18/2018	67.30	1724.92	

TABLE 3
WATER LEVEL DATA, FIRST QUARTER 2018 - Area IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY CALIFORNIA

Well Identifier	Geological Unit	Reference Point Elevation (feet above MSL)	Date of Measurement	Depth to Water (feet BTOC)	Static Water Level Elevation (feet above MSL)	Notes
RD-98	Chatsworth	1808.73	1/19/2018	55.06	1753.67	
RS-16	Shallow	1811.05	1/18/2018	Dry	---	
RS-18	Shallow	1802.86	1/17/2018	Dry	---	
RS-25	Shallow	1862.71	1/17/2018	Dry	---	
RS-27	Shallow	1804.78	1/17/2018	Dry	---	
RS-28	Shallow	1768.59	1/19/2018	Dry	---	
RS-54	Shallow	1846.66	1/18/2018	40.41	1806.25	
DS-43	Chatsworth	1809.52	1/17/2018	17.67	1791.85	
DS-44	Chatsworth	1851.21	1/18/2018	72.19	1779.02	
DS-45	Chatsworth	1866.58	1/17/2018	Dry	---	
DS-46	Chatsworth	1797.79	1/17/2018	42.70	1755.09	
DS-47	Chatsworth	1867.94	1/17/2018	110.67	1757.27	
DD-139	Chatsworth	1793.01	1/18/2018	181.25	1611.76	
DD-140	Chatsworth	1798.16	1/17/2018	156.55	1641.61	
DD-141	Chatsworth	1762.79	1/18/2018	75.89	1686.90	
DD-142	Chatsworth	1812.22	1/17/2018	63.23	1748.99	
DD-143	Chatsworth	1789.74	1/19/2018	44.13	1745.61	
DD-144	Chatsworth	1810.69	1/17/2018	23.36	1787.33	
DD-145	Chatsworth	1798.90	1/17/2018	28.29	1770.61	
C-8	Chatsworth	1842.23	1/19/2018	202.01	1640.22	

BTOC = below top of casing
MSL = Mean Sea Level
(1) = FLUTe well transducers not functioning
(2) = Pressure transducers installed on artesian well
(3) = Boeing Gauging Data
(4) = Obstruction; prior investigators left pump in well
--- = No data available or not applicable

Chatsworth = Chatsworth Formation groundwater unit.
Chatsworth Artesian = Chatsworth Formation groundwater unit - Artesian with hydrostatic head above land surface.
Shallow = Near Surface groundwater unit.
Static water level elevations were calculated using the following equation:
$E_w = E - D + C$
Where:
E_w = Elevation of water above mean sea level (feet)
E = Elevation above mean sea level at point of measurement (feet).
D = Depth to water (feet)
C = Calibration correction factor (feet)
PSI = pounds per square inch
MSL = mean sea level
BTOC = below top of casing

TABLE 4
EXCEPTIONS TO THE SITE-WIDE WATER QUALITY SAMPLING AND ANALYSIS PLAN,
FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

WELLS NOT SAMPLED	
Well Identifier	**Notes**
PZ-097, PZ-124, RS-18	Dry
RD-30	Dedicated submersible pump malfunction.
RD-57	FLUTe partially removed, well could not be sampled.
STABLILIZATION CRITERIA COLLECTED AT FIXED INTERVALS GREATER THAN 5 MINUTES	
DD-139, DD-140, DD-142, DS-46, PZ-105, PZ-108, PZ-109, PZ-120, RD-20, RD-29, RD-90, RD-95, RD-96	Readings were collected every 6 to 7 minutes to give enough time to exchange water in the flow through cell due to 50 ml/min flow rate.
PURGE VOLUME REQUIREMENTS NOT MET	
Purge volume was met on all wells sampled.	
LOW-FLOW STABILIZATION CRITERIA NOT MET	
PZ-109, RD-96	Water level drawdown exceeded 0.3 feet.
Well Identifier	**Notes**
QUALITY ASSURANCE PROJECT PLAN (QAPP) REQUIREMENTS	
Requirement	**Exceptions**
Trip Blanks submitted daily with samples analyzed for volatile organic compounds (VOCs), gasoline range organics, 1,4-Dioxane, and 1,2,3-Trichloropropane.	None - 100 Percent Submitted
Quality control (QC) samples collected	See Appendix A
Precision/Accuracy requirements met	See Appendix A

TABLE 4
EXCEPTIONS TO THE SITE-WIDE WATER QUALITY SAMPLING AND ANALYSIS PLAN,
FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

QUALITY ASSURANCE PROJECT PLAN (QAPP) REQUIREMENTS	
Requirement	**Exceptions**
OTHER	
Applicable Samples	The reporting limit for vinyl chloride was above the SSFL groundwater screening level reference value (SSFL screening criteria) maximum contaminant level (MCL) criteria of 0.5 microgram per liter (µg/L) at 1 µg/L. The method detection limit was 0.10 µg/L though and all sample results were nondetect so the 1 µg/L reporting limit is considered sufficient for project purposes. The reporting limit was also elevated for 1,2-dichloroethane at 1 µg/L (MDL 0.13). The MCL criteria is 0.5 µg/L for 1,2-dichloroethane. The reporting limit for gasoline range organics (GRO) is above the taste/odor threshold, but MDL (10 ug/L) was below the required criteria. The reporting limit for carbon tetrachloride was also above the SSFL screening criteria (MCL) of 0.5 µg/L at 1 µg/L. The MDL was 0.19 ug/L which is below the criteria. If results had been detected between the MDL and reporting limit they would have been reported as detected estimated results. All these sample results are considered sufficient and meet project requirements.
RD-34B	The pump intake could not be placed a depth halfway between the depth to water (61.5 feet below ground surface) and the bottom of the saturated open interval of the well (415 feet below ground surface). Pump could not be lowered past the obstruction in well present at a depth of 167 feet below ground surface. The pump was placed immediately above the obstruction and low-flow sampling procedures were followed for the collection of the water sample.

TABLE 5
GROUNDWATER FIELD PARAMETERS, FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Well Identifier	Date	Temperature (° C)	pH	Conductivity (mmhos)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Oxidation Reduction Potential (mV)
PZ-105	2/19/2018	17.70	7.08	1.346	5.56	15.0	143.2
PZ-108	2/19/2018	14.60	6.42	1.286	0.96	14.0	251.7
PZ-109	2/22/2018	15.90	6.72	1.279	1.14	16.0	216.0
PZ-120	2/26/2018	17.15	7.19	1.036	3.14	13.0	189.3
RD-07	2/26/2018	16.60	7.18	0.698	2.27	1.0	190.3
RD-14	3/2/2018	11.80	7.26	0.697	1.29	7.0	109.5
RD-17	3/2/2018	13.50	7.67	0.832	0.69	45.0	-72.7
RD-19	2/28/2018	19.68	6.80	1.904	1.04	4.0	165.1
RD-20	2/20/2018	12.80	6.46	1.629	3.41	1.0	228.7
RD-21	2/20/2018	16.96	7.47	0.798	3.45	11.0	151.2
RD-23	2/19/2018	16.05	7.19	0.871	4.73	12.0	92.1
RD-29	2/27/2018	12.30	6.87	0.854	0.81	12.0	193.8
RD-33A	3/1/2018	18.18	6.98	0.707	1.36	5.0	-30.1
RD-33B	2/20/2018	18.61	7.91	0.495	3.98	8.0	-50.7
RD-33C	2/21/2018	17.61	7.38	0.821	2.10	10.0	-52.6
RD-34A	3/2/2018	13.82	6.74	1.594	0.82	5.0	-20.1
RD-34B	3/1/2018	14.00	5.64	2.304	1.18	6.0	234.4
RD-34C	3/2/2018	17.06	7.56	0.670	0.57	7.0	-201.8
RD-54A	3/1/2018	16.70	6.75	0.940	2.42	23.0	162.4
RD-59A	2/28/2018	12.80	7.44	1.158	1.11	0.0	104.1
RD-59B	2/28/2018	19.00	7.44	0.798	0.16	0.0	12.1
RD-59C	2/28/2018	20.00	7.76	0.829	0.09	0.0	31.9
RD-63	2/21/2018	18.38	6.89	1.344	0.90	9.0	-123.1
RD-65	2/27/2018	18.15	7.00	0.580	1.65	5.0	56.3
RD-90	2/22/2018	17.30	6.33	1.176	2.39	4.0	219.9
RD-95	2/22/2018	10.50	6.58	1.418	1.42	38.0	237.0
RD-96	2/21/2018	13.30	7.34	0.973	2.57	1.0	183.0
RD-98	2/28/2018	15.78	6.92	0.981	5.58	3.0	254.1
DD-139	2/22/2018	19.92	6.87	0.845	2.64	10.0	85.1
DD-140	2/27/2018	11.00	7.36	0.824	1.07	12.0	178.0
DD-141	2/27/2018	14.19	7.03	1.082	1.65	28.0	101.2
DD-142	2/22/2018	17.59	7.34	1.496	1.28	5.0	145.9
DD-143	2/26/2018	24.07	6.94	1.537	0.77	58.0	174.0
DD-144	2/22/2018	19.69	7.11	1.290	1.54	86.0	-19.1
DD-145	2/19/2018	16.70	6.81	0.956	1.17	15.0	183.4
DS-43	2/22/2018	19.20	5.75	1.119	0.40	54.0	242.7
DS-44	2/23/2018	18,8	7.09	1.210	1.86	17.0	97.3
DS-46	2/27/2018	11.10	6.95	0.973	1.36	15.0	199.9
DS-47	2/23/2018	18.10	7.03	0.739	1.79	2.0	196.0
C-8	2/19/2018	18.92	7.62	0.675	2.92	10.0	-522.0

NOTES AND ABBREVIATIONS

° C - degrees Celsius
mmhos - millimhos
mg/L - milligrams per liter
mV - millivolt
NTU - nephelometric turbidity unit

TABLE 6
SAMPLES ANALYZED, FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Well ID	Event	Site-Wide Monitoring Program	DOE Area IV Groundwater RFI Analytes	Well Sponsor
PZ-105	2018 Q1	NA	VOCs Metals GRO, DRO Nitrates	DOE
PZ-108	2018 Q1	VOCs Metals	NA	DOE
PZ-109	2018 Q1	NA	VOCs	DOE
PZ-120	2018 Q1	NA	VOCs Metals Radiochemistry	DOE
RD-07	2018 Q1	VOCs Radiochemistry	Metals	DOE
RD-14	2018 Q1	VOCs 1,2,3-TCP Fluoride Radiochemistry	GRO, DRO	DOE
RD-17	2018 Q1	NA	VOCs Metals	DOE
RD-19	2018 Q1	VOCs Metals Radiochemistry Fluoride	GRO, DRO	DOE
RD-20	2018 Q1	VOCs Radiochemistry	Nitrates	DOE
RD-21	2018 Q1	NA	VOCs Metals Perchlorate	DOE
RD-23	2018 Q1	NA	VOCs	DOE
RD-29	2018 Q1	NA	VOCs	DOE
RD-33A	2018 Q1	VOCs Metals Perchlorate Radiochemistry	NA	
RD-33B	2018 Q1	VOCs Metals Perchlorate Radiochemistry	NA	DOE
RD-33C	2018 Q1	VOCs Metals Perchlorate Radiochemistry	NA	DOE
RD-34A	2018 Q1	VOCs Metals Radiochemistry Fluoride 1,4-Dioxane	GRO, DRO	DOE

TABLE 6
SAMPLES ANALYZED, FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Well ID	Event	Site-Wide Monitoring Program	DOE Area IV Groundwater RFI Analytes	Well Sponsor
RD-34B	2018 Q1	VOCs Metals Radiochemistry Fluoride 1,4-Dioxane	NA	DOE
RD-34C	2018 Q1	VOCs Metals Radiochemistry Fluoride 1,4-Dioxane	NA	DOE
RD-54A	2018 Q1	VOCs Metals Perchlorate Radiochemistry	GRO, DRO	DOE
RD-59A	2018 Q1	VOCs Metals Perchlorate Radiochemistry Fluoride	NA	DOE
RD-59B	2018 Q1	VOCs Metals Perchlorate Radiochemistry Fluoride	NA	DOE
RD-59C	2018 Q1	VOCs Metals Perchlorate Radiochemistry Fluoride	NA	DOE
RD-63	2018 Q1	VOCs Radiochemistry	GRO, DRO	DOE
RD-65	2018 Q1	NA	VOCs 1,4 Dioxane	DOE
RD-90	2018 Q1	NA	Tritium	DOE
RD-95	2018 Q1	NA	Tritium	DOE
RD-96	2018 Q1	VOCs Radiochemistry	Perchlorate GRO, DRO Metals	DOE
RD-98	2018 Q1	NA	VOCs Radiochemistry	DOE
DS-43	2018 Q1	NA	VOCs Metals	DOE
DS-44	2018 Q1	NA	VOCs Metals Radiochemistry	DOE
DS-46	2018 Q1		VOCs Metals	DOE
DS-47	2018 Q1	NA	VOCs Metals Radiochemistry	DOE
DD-139	2018 Q1	NA	VOCs Metals Perchlorate	DOE

TABLE 6
SAMPLES ANALYZED, FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Well ID	Event	Site-Wide Monitoring Program	DOE Area IV Groundwater RFI Analytes	Well Sponsor
DD-140	2018 Q1	NA	VOCs Metals	DOE
DD-141	2018 Q1		VOCs Metals Perchlorate GRO, DRO Radiochemistry	DOE
DD-142	2018 Q1	NA	VOCs Metals	DOE
DD-143	2018 Q1	NA	VOCs Metals Radiochemistry	DOE
DD-144	2018 Q1	NA	VOCs Metals Tritium	DOE
DD-145	2018 Q1	NA	VOCs Metals GRO, DRO Nitrates	DOE
C-8	2018 Q1	NA	VOCs Metals	DOE

NOTES AND ABBREVIATIONS:
GW RFI - Groundwater RCRA Facility Investigation
DOE Area IV - Department of Energy Area IV
1,2,3-TCP - 1,2,3-Trichloropropane
DRO - Diesel Range Organics
GRO - Gasoline Range Organics
VOCs - Volatile Organic Compounds
NA - Not applicable

SSFL RADIOCHEMSTRY SUITE **
Gross Alpha and Gross Beta (Particulate & Dissolved);
Isotopic Uranium (Particulate & Dissolved),
Sr-90 (Particulate & Dissolved);
Am-241 (Particulate & Dissolved);
TM-171 (Particulate & Dissolved);
Cm-243/244, Cm-245/246 (Particulate & Dissolved);
Pu-238, Pu-239/240, Pu-242 (Particulate & Dissolved);
C-14 (Particulate & Dissolved);
I-129 (Particulate & Dissolved)
** - beginning 1st QTR 2015, particulate analysis is not performed. Total and dissolved radionuclide results provided.

TABLE 7
GROUNDWATER
MONITORING PROGRAM ANALYSES, FIRST QUARTER 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analytes			**Analytical Method**
1,2,3-Trichloropropane			8260B/E524.2
1,4-Dioxane			8260B SIM
Fluoride, Nitrate			300.0
Metals[1]:	Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Coba		6010C/6020A/7470A
	Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potasium, Selenium,		
	Silver, Sodium, Strontium, Thallium, Tin, Vanadium, Zinc		
Perchlorate			6860
Radiochemistry:	Cesium-137 and other Gamma-emitting radionuclides[2]		901.1
	Gross Alpha and Gross Beta		900.0
	Radium-226		903.0
	Radium-228		904.0
	Strontium-90		905.0/ASTM D5811-95
	Tritium		906.0
	Isotopic Uranium		DOE A-01-R
Gasoline Range Organics			8015B
Diesel Range Organics			8015B
Volatile Organic Compounds:			8260B
	1,1,1-Trichloroethane	cis-1,2-Dichloroethene	
	1,1,2-Trichloro-1,2,2-trifluoroethane	Dibromofluoromethane (Surr)	
	1,1,2-Trichloroethane	Ethylbenzene	
	1,1-Dichloroethane	Methylene Chloride	
	1,1-Dichloroethene	Tetrachloroethene	
	1,2-Dichloroethane	Toluene	
	1,2-Dichloroethane-d4 (Surr)	Toluene-d8 (Surr)	
	2-Butanone (MEK)	trans-1,2-Dichloroethene	
	4-Bromofluorobenzene (Surr)	Trichloroethene	
	Acetone	Trichlorofluoromethane	
	Benzene	Vinyl Chloride	
	Carbon Tetrachloride	Xylenes (Total)	
	Chloroform		

Notes:

[1] Metal analyses include total and dissolved fractions

[2] Radionuclides by Method 901.1: Actinium-228, Americium-241, Antimony-125, Barium-133, Cesium-134, Cesium-137, Cobalt-57, Cobalt-60, Europium-152, Europium-154, Europium-155, Manganese-54, Potassium-40, Sodium-22.

MEK - Methyl Ethyl Ketone

Laboratories: Test America, St. Louis; Test America, Denver; Test America, Irvine

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Radiochemistry	Actinium-228		pCi/L	
Radiochemistry	Antimony-125	300	pCi/L	Primary MCL [a]
Radiochemistry	Barium-133	1520	pCi/L	Primary MCL [b]
Radiochemistry	Barium-137m	2150000	pCi/L	Primary MCL [b]
Radiochemistry	Bismuth-212		pCi/L	
Radiochemistry	Bismuth-214		pCi/L	
Radiochemistry	Carbon-14	2000	pCi/L	Primary MCL [a]
Radiochemistry	Cesium-134	80	pCi/L	Primary MCL [a]
Radiochemistry	Cesium-137	200	pCi/L	Primary MCL [a]
Radiochemistry	Cobalt-57	1000	pCi/L	Primary MCL [a]
Radiochemistry	Cobalt-60	100	pCi/L	Primary MCL [a]
Radiochemistry	Europium-152	200	pCi/L	Primary MCL [a]
Radiochemistry	Gross alpha	15	pCi/L	Primary MCL
Radiochemistry	Gross beta	50	pCi/L	Cal MCL
Radiochemistry	Gross beta	4	mrem/yr	Primary MCL
Radiochemistry	Iodine-129	1	pCi/L	Primary MCL [a]
Radiochemistry	Lead-210		pCi/L	
Radiochemistry	Lead-212		pCi/L	
Radiochemistry	Lead-214		pCi/L	
Radiochemistry	Potassium-40		pCi/L	
Radiochemistry	Manganese-54	300	pCi/L	Primary MCL [a]
Radiochemistry	Neptunium-236	5960	pCi/L	Primary MCL [b]
Radiochemistry	Niobium-94	707	pCi/L	Primary MCL [b]
Radiochemistry	Radium-226/228	5	pCi/L	Primary MCL
Radiochemistry	Sodium-22	400	pCi/L	Primary MCL [a]
Radiochemistry	Strontium-90	8	pCi/L	Primary MCL
Radiochemistry	Thallium-208		pCi/L	
Radiochemistry	Thorium-234		pCi/L	
Radiochemistry	Thulium-171	1000	pCi/L	Primary MCL [a]
Radiochemistry	Tin-126	293	pCi/L	Primary MCL [b]
Radiochemistry	Tritium	20000	pCi/L	Primary MCL
Radiochemistry	Uranium-233/234	20	pCi/L	Cal MCL
Radiochemistry	Uranium-235	20	pCi/L	Cal MCL
Radiochemistry	Uranium-238	20	pCi/L	Cal MCL
Halogenated Ethenes	1,2-Dichloroethenes	130	ug/L	SWGW RBSL
Halogenated Ethenes	Chlorotrifluoroethylene		ug/L	
Halogenated Ethenes	Tetrachloroethene	5	ug/L	Primary MCL
Halogenated Ethenes	Trichloroethene	5	ug/L	Primary MCL
Halogenated Ethenes	cis-1,2-Dichloroethene	6	ug/L	Cal MCL
Halogenated Ethenes	trans-1,2-Dichloroethene	10	ug/L	Cal MCL
Halogenated Ethenes	1,1-Dichloroethene	6	ug/L	Cal MCL
Halogenated Ethenes	Vinyl chloride	0.5	ug/L	Cal MCL
Halogenated Ethanes	1,1,1,2-Tetrachloroethane		ug/L	
Halogenated Ethanes	1,1,2,2-Tetrachloroethane	1	ug/L	Cal MCL
Halogenated Ethanes	1,1,2-Trichloroethane	5	ug/L	Primary MCL
Halogenated Ethanes	1,1,1-Trichloroethane	200	ug/L	Primary MCL
Halogenated Ethanes	1,2-Dichloroethane	0.5	ug/L	Cal MCL
Halogenated Ethanes	1,1-Dichloroethane	5	ug/L	Cal MCL
Halogenated Ethanes	Chloroethane	16	ug/L	Taste/Odor
Halogenated Ethanes	2-Chloro-1,1,1-trifluoroethane		ug/L	
Halogenated Ethanes	1,2-Dibromoethane	0.05	ug/L	Primary MCL
Halogenated Ethanes	Dichlorodifluoroethane		ug/L	
Halogenated Ethanes	1,1,2-Trichloro-1,2,2-trifluoroethane	1200	ug/L	Cal MCL
Halogenated Ethanes	1,2-Dichloro-1,1,2-trifluoroethane	190000	ug/L	SWGW RBSL
Halogenated Ethanes	Dichlorotrifluoroethane		ug/L	

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Halogenated Ethanes	2,2-Dichloro-1,1,1-trifluoroethane	190000	ug/L	SWGW RBSL
Halogenated Ethanes	Trichlorotrifluorethane		ug/L	
Halogenated Methanes	Dichlorofluoromethane		ug/L	
Halogenated Methanes	Isocyanomethane		ug/L	
Halogenated Methanes	Carbon Tetrachloride	0.5	ug/L	Cal MCL
Halogenated Methanes	Chloroform	80	ug/L	Primary MCL
Halogenated Methanes	Methylene chloride	5	ug/L	Primary MCL
Halogenated Methanes	Chloromethane	5.7	ug/L	SWGW RBSL
Halogenated Methanes	Trichlorofluoromethane	150	ug/L	Cal MCL
Halogenated Methanes	Dichlorodifluoromethane	1000	ug/L	Notification Level
Halogenated Methanes	Bromochloromethane	34000	ug/L	Taste/Odor
Halogenated Methanes	Bromodichloromethane	80	ug/L	Primary MCL
Halogenated Methanes	Bromoform	80	ug/L	Primary MCL
Halogenated Methanes	Bromomethane	8.8	ug/L	SWGW RBSL
Halogenated Methanes	Dibromochloromethane	80	ug/L	Primary MCL
Halogenated Methanes	Dibromomethane		ug/L	
Halogenated Methanes	Iodomethane		ug/L	
Non-Halogenated VOCs	Total Complex Matrix		ug/L	
Non-Halogenated VOCs	1-Chlorohexane		ug/L	
Non-Halogenated VOCs	1-Hexanol		ug/L	
Non-Halogenated VOCs	1-Octanol		ug/L	
Non-Halogenated VOCs	2-Heptanone	280	ug/L	Taste/Odor
Non-Halogenated VOCs	2-Naphthaleneethanol		ug/L	
Non-Halogenated VOCs	Acetic Acid Ester		ug/L	
Non-Halogenated VOCs	Acetic Acid, 2-Methylpropyl Ester		ug/L	
Non-Halogenated VOCs	Acetic Acid, Butyl Ester		ug/L	
Non-Halogenated VOCs	Acetic Acid, Hexyl Ester		ug/L	
Non-Halogenated VOCs	Benzene, 1-Bromo-3-fluoro-		ug/L	
Non-Halogenated VOCs	Benzyl chloride	12	ug/L	Taste/Odor
Non-Halogenated VOCs	Butanoic Acid, Ethyl Ester		ug/L	
Non-Halogenated VOCs	Butyl Cyclooctane		ug/L	
Non-Halogenated VOCs	Cumene	770	ug/L	Notification Level
Non-Halogenated VOCs	Ethanol	760000	ug/L	Taste/Odor
Non-Halogenated VOCs	Ethanone, 1-(2,4,6-Trihydroxyphenyl)-		ug/L	
Non-Halogenated VOCs	Ethyl acetate	2600	ug/L	Taste/Odor
Non-Halogenated VOCs	Ethyl cyanide		ug/L	
Non-Halogenated VOCs	Ethyl ether	750	ug/L	Taste/Odor
Non-Halogenated VOCs	Formic acid, octyl ester		ug/L	
Non-Halogenated VOCs	Heptanal		ug/L	
Non-Halogenated VOCs	Hexanoic Acid, Ethyl Ester		ug/L	
Non-Halogenated VOCs	Methanol	740000	ug/L	Taste/Odor
Non-Halogenated VOCs	Methyl sulfide		ug/L	
Non-Halogenated VOCs	m-Xylene & p-Xylene	1750	ug/L	Cal MCL
Non-Halogenated VOCs	Naphthalene, 1-(2-Propenyl)-		ug/L	
Non-Halogenated VOCs	n-Hexane	6.4	ug/L	Taste/Odor
Non-Halogenated VOCs	Octanal		ug/L	
Non-Halogenated VOCs	p-Cymene		ug/L	
Non-Halogenated VOCs	Pentanal	17	ug/L	Taste/Odor
Non-Halogenated VOCs	Propanoic Acid, 2-Methyl-, ethyl ester		ug/L	
Non-Halogenated VOCs	sec-Butyl alcohol	19000	ug/L	Taste/Odor
Non-Halogenated VOCs	tert-Butyl alcohol	12	ug/L	Notification Level
Non-Halogenated VOCs	tert-Butyl ethyl ether		ug/L	
Non-Halogenated VOCs	Tetrahydrofuran		ug/L	
Non-Halogenated VOCs	Tetramethylurea		ug/L	
Non-Halogenated VOCs	Trimethylcyclopentane Isomer		ug/L	

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Non-Halogenated VOCs	1,3,5-Trimethylbenzene	330	ug/L	Notification Level
Non-Halogenated VOCs	Biphenyl		ug/L	
Non-Halogenated VOCs	1,2,4-Trimethylbenzene	330	ug/L	Notification Level
Non-Halogenated VOCs	2-Hexanone	250	ug/L	Taste/Odor
Non-Halogenated VOCs	Acetone	20000	ug/L	Taste/Odor
Non-Halogenated VOCs	Acetonitrile	300000	ug/L	Taste/Odor
Non-Halogenated VOCs	Acrolein	110	ug/L	Taste/Odor
Non-Halogenated VOCs	Acrylonitrile	910	ug/L	Taste/Odor
Non-Halogenated VOCs	Benzene	1	ug/L	Cal MCL
Non-Halogenated VOCs	Carbon Disulfide	160	ug/L	Notification Level
Non-Halogenated VOCs	Diisopropyl ether		ug/L	
Non-Halogenated VOCs	Ethane	7500	ug/L	Taste/Odor
Non-Halogenated VOCs	Ethyl methacrylate		ug/L	
Non-Halogenated VOCs	Ethylbenzene	300	ug/L	Cal MCL
Non-Halogenated VOCs	Ethylene	39	ug/L	Taste/Odor
Non-Halogenated VOCs	Isobutanol		ug/L	
Non-Halogenated VOCs	Isopropanol	160000	ug/L	Taste/Odor
Non-Halogenated VOCs	m-Xylene	1750	ug/L	Cal MCL
Non-Halogenated VOCs	Methacrylonitrile	2100	ug/L	Taste/Odor
Non-Halogenated VOCs	Methane	3100	ug/L	SWGW RBSL
Non-Halogenated VOCs	Methyl ethyl ketone	3800	ug/L	SWGW RBSL
Non-Halogenated VOCs	Methyl isobutyl ketone (MIBK)	120	ug/L	Notification Level
Non-Halogenated VOCs	Methyl methacrylate	25	ug/L	Taste/Odor
Non-Halogenated VOCs	Methyl tert-butyl ether	5	ug/L	Secondary MCL
Non-Halogenated VOCs	n-Butylbenzene	260	ug/L	Notification Level
Non-Halogenated VOCs	n-Propylbenzene	260	ug/L	Notification Level
Non-Halogenated VOCs	Naphthalene	17	ug/L	Notification Level
Non-Halogenated VOCs	o + p Xylene	1750	ug/L	Cal MCL
Non-Halogenated VOCs	o-Xylene	1750	ug/L	Cal MCL
Non-Halogenated VOCs	sec-Butylbenzene	260	ug/L	Notification Level
Non-Halogenated VOCs	Styrene	100	ug/L	Primary MCL
Non-Halogenated VOCs	tert-Amyl methyl ether		ug/L	
Non-Halogenated VOCs	tert-Butylbenzene	260	ug/L	Notification Level
Non-Halogenated VOCs	Toluene	150	ug/L	Cal MCL
Non-Halogenated VOCs	Vinyl acetate	88	ug/L	Taste/Odor
Non-Halogenated VOCs	Xylenes, Total	1750	ug/L	Cal MCL
Halogenated Benzenes	1,4-Dichlorobenzene-d4		ug/L	
Halogenated Benzenes	1,2,3-Trichlorobenzene	2.1	ug/L	SWGW RBSL
Halogenated Benzenes	1,2,4-Trichlorobenzene	5	ug/L	Cal MCL
Halogenated Benzenes	1,2-Dichlorobenzene	600	ug/L	Primary MCL
Halogenated Benzenes	1,3-Dichlorobenzene	600	ug/L	Archived Advisory Level
Halogenated Benzenes	1,4-Dichlorobenzene	5	ug/L	Cal MCL
Halogenated Benzenes	Bromobenzene		ug/L	
Halogenated Benzenes	Chlorobenzene	70	ug/L	Cal MCL
Halogenated Benzenes	Dichlorobenzenes		ug/L	
Halogenated Propene/Propanes	cis-1,4-Dichloro-2-butene		ug/L	
Halogenated Propene/Propanes	Dichloropropane		ug/L	
Halogenated Propene/Propanes	sec-Dichloropropane		ug/L	
Halogenated Propene/Propanes	1,1-Dichloropropene		ug/L	
Halogenated Propene/Propanes	1,2,3-Trichloropropane	0.005	ug/L	Notification Level
Halogenated Propene/Propanes	3-Chloro-2(Chloromethyl)-1-Propene		ug/L	
Halogenated Propene/Propanes	1,2-Dibromo-3-chloropropane	0.2	ug/L	Primary MCL
Halogenated Propene/Propanes	1,2-Dichloropropane	5	ug/L	Primary MCL
Halogenated Propene/Propanes	1,3-Dichloropropane	130	ug/L	SWGW RBSL
Halogenated Propene/Propanes	1,3-Dichloropropene	0.5	ug/L	Cal MCL

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Halogenated Propene/Propanes	Allyl chloride	8.9	ug/L	Taste/Odor
Halogenated Propene/Propanes	cis-1,3-Dichloropropene	0.5	ug/L	Cal MCL
Halogenated Propene/Propanes	trans-1,3-Dichloropropene	0.81	ug/L	SWGW RBSL
Other Halogenated VOCs	1,1-Dichlorobutane		ug/L	
Other Halogenated VOCs	o-Chlorotoluene	140	ug/L	Notification Level
Other Halogenated VOCs	p-Chlorotoluene	140	ug/L	Notification Level
Other Halogenated VOCs	Total Organic Halogens		ug/L	
Other Halogenated VOCs	trans-1,4-Dichloro-2-butene		ug/L	
Other Halogenated VOCs	Hexachlorobutadiene		ug/L	
Other Halogenated VOCs	Chloroprene		ug/L	
Other Halogenated VOCs	2-Chloroethylvinyl ether		ug/L	
1,4-Dioxane	1,4-Dioxane	1	ug/L	Notification Level
SVOC	2-n-Butoxyethanol		ug/L	
SVOC	Amino Hexanoic Acid		ug/L	
SVOC	Benzene Alcohol		ug/L	
SVOC	Benzophenone		ug/L	
SVOC	Carboxylic Acid		ug/L	
SVOC	Decanol		ug/L	
SVOC	Dibenzyl Ether		ug/L	
SVOC	Dichloro Alkene		ug/L	
SVOC	Dichloromethylpropene		ug/L	
SVOC	Dichloropropene, NOS		ug/L	
SVOC	Dimethyl Decene		ug/L	
SVOC	Dimethyl Undecane		ug/L	
SVOC	Diphenyl ether	630	ug/L	SWGW RBSL
SVOC	Molecular Sulfur		ug/L	
SVOC	p-Cresol	63	ug/L	SWGW RBSL
SVOC	p-Dinitrobenzene	1.3	ug/L	SWGW RBSL
SVOC	Trimethyl Decane		ug/L	
SVOC	1,1-Dimethylhydrazine		ug/L	
SVOC	1,2-Dinitrobenzene		ug/L	
SVOC	1-Chloronaphthalene		ug/L	
SVOC	1-Nitronaphthalene		ug/L	
SVOC	2,3,4-Trichlorophenol		ug/L	
SVOC	4-Am-2,6-DNT		ug/L	
SVOC	4-Nitroquinoline-1-oxide		ug/L	
SVOC	Acetamidofluorene		ug/L	
SVOC	alpha, alpha-Dimethylphenethylamine		ug/L	
SVOC	alpha-Naphthylamine		ug/L	
SVOC	alpha-Picoline		ug/L	
SVOC	beta-Naphthylamine		ug/L	
SVOC	Carbazole		ug/L	
SVOC	Decamethylcyclopentasiloxane		ug/L	
SVOC	Diazinon	1.2	ug/L	Notification Level
SVOC	Dibenz(a,j)acridine		ug/L	
SVOC	Diethyl phthalate	10000	ug/L	SWGW RBSL
SVOC	Ethylene glycol	14000	ug/L	Notification Level
SVOC	Formaldehyde	100	ug/L	Notification Level
SVOC	Hydrazine	160000	ug/L	Taste/Odor
SVOC	m+p Cresol		ug/L	
SVOC	m-Cresol	37	ug/L	Taste/Odor
SVOC	Monomethylhydrazine		ug/L	
SVOC	o-Cresol	630	ug/L	SWGW RBSL
SVOC	p-Chloroaniline		ug/L	
SVOC	p-Nitroaniline		ug/L	

TABLE 8
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VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
SVOC	Surfactants		ug/L	
SVOC	sym-Trinitrobenzene		ug/L	
SVOC	Zinophos		ug/L	
SVOC	1,1'-Phenylene-Bis-Ethanone		ug/L	
SVOC	1,2,3-Trichloropropene	0.005	ug/L	Notification Level
SVOC	1,2,4,5-Tetrachlorobenzene		ug/L	
SVOC	1,2-Diphenylhydrazine		ug/L	
SVOC	1,3-Dinitrobenzene	1.3	ug/L	SWGW RBSL
SVOC	1,4-Naphthoquinone		ug/L	
SVOC	2,3,4,6-Tetrachlorophenol		ug/L	
SVOC	2,4,5-Trichlorophenol		ug/L	
SVOC	2,4,6-Trichlorophenol	2.1	ug/L	SWGW RBSL
SVOC	2,4-Dichlorophenol		ug/L	
SVOC	2,4-Dimethylphenol	100	ug/L	Archived Advisory Level
SVOC	2,4-Dinitrophenol		ug/L	
SVOC	2,4-Dinitrotoluene		ug/L	
SVOC	2,6-Dichlorophenol		ug/L	
SVOC	2,6-Dinitrotoluene	0.22	ug/L	SWGW RBSL
SVOC	2-Butoxyethoxyethanol		ug/L	
SVOC	2-Chloronaphthalene		ug/L	
SVOC	2-Chlorophenol	63	ug/L	SWGW RBSL
SVOC	2-Nitroaniline		ug/L	
SVOC	2-Nitrophenol		ug/L	
SVOC	3,3'-Dichlorobenzidine	0.12	ug/L	SWGW RBSL
SVOC	3-Methylcholanthrene		ug/L	
SVOC	3-Nitroaniline		ug/L	
SVOC	4,6-Dinitro-o-cresol	1.3	ug/L	SWGW RBSL
SVOC	4-Aminobiphenyl		ug/L	
SVOC	4-Bromophenyl phenyl ether		ug/L	
SVOC	4-Chlorophenylphenyl ether		ug/L	
SVOC	4-Nitrophenol		ug/L	
SVOC	5-Nitro-o-toluidine		ug/L	
SVOC	7,12-Dimethylbenz(a)anthracene		ug/L	
SVOC	Acetophenone		ug/L	
SVOC	Alkene		ug/L	
SVOC	Aniline	65000	ug/L	Taste/Odor
SVOC	Aramite		ug/L	
SVOC	Azobenzene		ug/L	
SVOC	Benzidine	0.0003	ug/L	SWGW RBSL
SVOC	Benzo (b+k) fluoranthene (Total)		ug/L	
SVOC	Benzoic acid	50000	ug/L	SWGW RBSL
SVOC	Benzyl alcohol		ug/L	
SVOC	bis(2-Chloroethoxy)methane	38	ug/L	SWGW RBSL
SVOC	bis(2-Chloroethyl) ether	360	ug/L	Taste/Odor
SVOC	bis(2-Chloroisopropyl) ether		ug/L	
SVOC	bis(2-Ethylhexyl) phthalate	4	ug/L	Cal MCL
SVOC	Butyl benzyl phthalate	78	ug/L	SWGW RBSL
SVOC	Di-n-butyl phthalate	1300	ug/L	SWGW RBSL
SVOC	Di-n-octyl phthalate	500	ug/L	SWGW RBSL
SVOC	Dibenzofuran		ug/L	
SVOC	Dimethyl phthalate	130000	ug/L	SWGW RBSL
SVOC	Diphenylamine		ug/L	
SVOC	Ethyl methanesulfonate		ug/L	
SVOC	Hexachlorobenzene	1	ug/L	Primary MCL
SVOC	Hexachlorocyclopentadiene	50	ug/L	Primary MCL

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
SVOC	Hexachloroethane	10	ug/L	Taste/Odor
SVOC	Hexachlorophene		ug/L	
SVOC	Hexachloropropene		ug/L	
SVOC	Isodrin		ug/L	
SVOC	Isophorone	5400	ug/L	Taste/Odor
SVOC	Isosafrole		ug/L	
SVOC	Methapyrilene		ug/L	
SVOC	Methyl methanesulfonate		ug/L	
SVOC	n-Nitrosodi-n-butylamine		ug/L	
SVOC	n-Nitrosodi-n-propylamine	0.01	ug/L	Notification Level
SVOC	n-Nitrosodiethylamine	0.01	ug/L	Notification Level
SVOC	n-Nitrosodiphenylamine	16	ug/L	SWGW RBSL
SVOC	n-Nitrosomethylethylamine		ug/L	
SVOC	n-Nitrosomorpholine		ug/L	
SVOC	n-Nitrosopiperidine		ug/L	
SVOC	n-Nitrosopyrrolidine		ug/L	
SVOC	Nitrobenzene	110	ug/L	Taste/Odor
SVOC	o,o,o-Triethylphosphorothioate		ug/L	
SVOC	o-Tolidine		ug/L	
SVOC	o-Toluidine	11000	ug/L	Taste/Odor
SVOC	p-Chloro-m-cresol		ug/L	
SVOC	p-Dimethylaminoazobenzene		ug/L	
SVOC	p-Phenylenediamine		ug/L	
SVOC	Pentachlorobenzene		ug/L	
SVOC	Pentachloroethane		ug/L	
SVOC	Pentachloronitrobenzene	20	ug/L	Archived Advisory Level
SVOC	Pentachlorophenol	1	ug/L	Primary MCL
SVOC	Phenacetin		ug/L	
SVOC	Phenol	4200	ug/L	Archived Advisory Level
SVOC	Pronamide		ug/L	
SVOC	Pyridine	950	ug/L	Taste/Odor
SVOC	Safrole		ug/L	
SVOC	Tetrachloropropene		ug/L	
PAH	1-Methyl naphthalene		ug/L	
PAH	2-Methylnaphthalene	50	ug/L	SWGW RBSL
PAH	Acenaphthene		ug/L	
PAH	Acenaphthylene		ug/L	
PAH	Anthracene	3800	ug/L	SWGW RBSL
PAH	Benzo(a)anthracene		ug/L	
PAH	Benzo(a)pyrene	0.2	ug/L	Primary MCL
PAH	Benzo(b)fluoranthene		ug/L	
PAH	Benzo(ghi)perylene		ug/L	
PAH	Benzo(k)fluoranthene		ug/L	
PAH	Chrysene		ug/L	
PAH	Dibenzo(a,h)anthracene		ug/L	
PAH	Fluoranthene		ug/L	
PAH	Fluorene		ug/L	
PAH	Indeno(1,2,3-cd)pyrene		ug/L	
PAH	Phenanthrene	3800	ug/L	SWGW RBSL
PAH	Pyrene	380	ug/L	SWGW RBSL
NDMA	n-Nitrosodimethylamine	0.01	ug/L	Notification Level
Energetics	Perchlorate	6	ug/L	Cal MCL
Energetics	2-Amino-4,6-Dinitrotoluene		ug/L	
Energetics	2-Nitrotoluene		ug/L	
Energetics	3-Nitrotoluene		ug/L	

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Energetics	4-Nitrotoluene		ug/L	
Energetics	Nitroglycerin		ug/L	
Energetics	PETN		ug/L	
Energetics	Tetryl		ug/L	
Energetics	2,4,6-Trinitrotoluene	1	ug/L	Notification Level
Energetics	HMX	350	ug/L	Notification Level
Energetics	RDX	0.3	ug/L	Notification Level
TPH	Fuel Hydrocarbons, C4-C12, as heavy Hydrocarbons	500	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C6-C14, as JP-4	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C6-C15, as JP-4	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C6-C16, as JP-4	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C6-C16, C21-C24, as JP-4	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C6-C7	500	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C6-C7, C10-C16, as kerosene		ug/L	
TPH	Fuel Hydrocarbons, C7-C10, as gasoline	5	ug/L	Taste/Odor
TPH	Fuel Hydrocarbons, C7-C14, as JP-4	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C7-C16, as JP-4	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C8-C10, as gasoline	5	ug/L	Taste/Odor
TPH	Fuel Hydrocarbons, C8-C12, as heavy Hydrocarbons	1800	ug/L	SWGW RBSL
TPH	Fuel Hydrocarbons, C8-C14, as heavy Hydrocarbons	1800	ug/L	SWGW RBSL
TPH	Gasoline Range Organics (C4-C12)	5	ug/L	Taste/Odor
TPH	Gasoline Range Organics (C6-C14)	5	ug/L	Taste/Odor
TPH	Gasoline Range Organics (C6-C7)		ug/L	
TPH	Gasoline Range Organics (C7-C12)	5	ug/L	Taste/Odor
TPH	Total Extractable Hydrocarbons C10-C18		ug/L	
TPH	Total Hydrocarbons C8-C18		ug/L	
TPH	Diesel Range Organics	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C12-C14)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C13-C22)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C14-C20)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C15-C20)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C20-C30)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C21-C24)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C21-C30)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C8-C11)	100	ug/L	Taste/Odor
TPH	Diesel Range Organics (C8-C30)	100	ug/L	Taste/Odor
TPH	Fuel Hydrocarbons, C6-C17, as JP-4	1800	ug/L	SWGW RBSL
TPH	Gasoline Range Organics (C8-C11)	1800	ug/L	SWGW RBSL
TPH	Jet Fuel 4 (C6-C13)	1800	ug/L	SWGW RBSL
TPH	Kerosene (C10-C12)	1800	ug/L	SWGW RBSL
TPH	Kerosene (C10-C14)	1800	ug/L	SWGW RBSL
TPH	Kerosene (C6-C14)		ug/L	
TPH	Kerosene Range Organics (C11-C14)	1800	ug/L	SWGW RBSL
TPH	Oil Range Organics (C23-C32)		ug/L	
TPH	Total Petroleum Hydrocarbons		ug/L	
TPH	Total Petroleum Hydrocarbons (as Kerosene)	1800	ug/L	SWGW RBSL
TPH	Total Volatile Hydrocarbons		ug/L	
TPH	Gasoline Range Organics	5	ug/L	Taste/Odor
TPH	Gasoline Range Organics (C6-C12)	5	ug/L	Taste/Odor
TPH	TRPH		ug/L	
TPH	Total Extractable Hydrocarbons C16-C25		ug/L	
TPH	Petroleum Hydrocarbons		ug/L	
PCB	Aroclor 1016	0.5	ug/L	Primary MCL
PCB	Polychlorinated biphenyls	0.5	ug/L	Primary MCL

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
PCB	Aroclor 1254	0.5	ug/L	Primary MCL
PCB	Aroclor 1260	0.5	ug/L	Primary MCL
PCB	Aroclor 1221	0.5	ug/L	Primary MCL
PCB	Aroclor 1232	0.5	ug/L	Primary MCL
PCB	Aroclor 1242	0.5	ug/L	Primary MCL
PCB	Aroclor 1248	0.5	ug/L	Primary MCL
Herbicides	2,4,5-Trichlorophenoxypropionic acid (Silvex)	50	ug/L	Cal MCL
Herbicides	2,4-Dichlorophenoxyacetic Acid (2,4-D)	130	ug/L	SWGW RBSL
Herbicides	2,4,5-T	130	ug/L	SWGW RBSL
Herbicides	Dalapon	200	ug/L	Cal MCL
Herbicides	Dinoseb	7	ug/L	Primary MCL
Herbicides	MCPP		ug/L	
Herbicides	Propachlor	90	ug/L	Notification Level
Pesticides	4,4'-DDT		ug/L	
Pesticides	a-Chlordane		ug/L	
Pesticides	Chlorobenzilate		ug/L	
Pesticides	Diallate		ug/L	
Pesticides	Famphur		ug/L	
Pesticides	Kepone	0.0093	ug/L	SWGW RBSL
Pesticides	Endosulfan I	75	ug/L	SWGW RBSL
Pesticides	Endosulfan II	75	ug/L	SWGW RBSL
Pesticides	Endrin ketone		ug/L	
Pesticides	gamma-BHC	0.2	ug/L	Primary MCL
Pesticides	gamma-Chlordane		ug/L	
Pesticides	Methyl parathion	2	ug/L	Archived Advisory Level
Pesticides	p,p'-Methoxychlor	30	ug/L	Cal MCL
Pesticides	Parathion	40	ug/L	Archived Advisory Level
Pesticides	Tetra ethyldithiopyrophosphate		ug/L	
Pesticides	y-Chlordane		ug/L	
Pesticides	Endosulfan sulfate	75	ug/L	SWGW RBSL
Pesticides	4,4'-DDE	0.44	ug/L	SWGW RBSL
Pesticides	Aldrin	0.002	ug/L	Archived Advisory Level
Pesticides	alpha-BHC	0.015	ug/L	Archived Advisory Level
Pesticides	beta-BHC	0.025	ug/L	Archived Advisory Level
Pesticides	Chlordane	0.1	ug/L	Cal MCL
Pesticides	delta-BHC		ug/L	
Pesticides	Dieldrin	0.002	ug/L	Archived Advisory Level
Pesticides	Dimethoate	1	ug/L	Archived Advisory Level
Pesticides	Dimethoate			
Pesticides	Disulfoton		ug/L	
Pesticides	4,4'-DDD	0.62	ug/L	SWGW RBSL
Pesticides	Toxaphene	3	ug/L	Primary MCL
Pesticides	Endrin	2	ug/L	Primary MCL
Pesticides	Endrin aldehyde		ug/L	
Pesticides	Heptachlor	0.01	ug/L	Cal MCL
Pesticides	Heptachlor epoxide	0.01	ug/L	Cal MCL
Pesticides	Phorate		ug/L	
Dioxins/Furans	1,2,3,4,6,7,8-Heptachlorodibenzofuran		ug/L	
Dioxins/Furans	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin		ug/L	
Dioxins/Furans	1,2,3,4,7,8,9-Heptachlorodibenzofuran		ug/L	
Dioxins/Furans	1,2,3,4,7,8-Hexachlorodibenzofuran		ug/L	
Dioxins/Furans	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin		ug/L	
Dioxins/Furans	1,2,3,6,7,8-Hexachlorodibenzofuran		ug/L	
Dioxins/Furans	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin		ug/L	
Dioxins/Furans	1,2,3,7,8,9-Hexachlorodibenzofuran		ug/L	

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Dioxins/Furans	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin		ug/L	
Dioxins/Furans	1,2,3,7,8-Pentachlorodibenzofuran		ug/L	
Dioxins/Furans	1,2,3,7,8-Pentachlorodibenzo-p-dioxin		ug/L	
Dioxins/Furans	2,3,4,6,7,8-Hexachlorodibenzofuran		ug/L	
Dioxins/Furans	2,3,4,7,8-Pentachlorodibenzofuran		ug/L	
Dioxins/Furans	2,3,7,8-Tetrachlorodibenzofuran		ug/L	
Dioxins/Furans	Heptachlorodibenzofurans		ug/L	
Dioxins/Furans	Heptachlorodibenzo-p-dioxins		ug/L	
Dioxins/Furans	Hexachlorodibenzofurans		ug/L	
Dioxins/Furans	Hexachlorodibenzo-p-dioxins		ug/L	
Dioxins/Furans	Octachlorodibenzofuran		ug/L	
Dioxins/Furans	Octachlorodibenzo-p-dioxin		ug/L	
Dioxins/Furans	PCDFs (Furans)		ug/L	
Dioxins/Furans	Pentachlorodibenzofurans		ug/L	
Dioxins/Furans	Pentachlorodibenzo-p-dioxins		ug/L	
Dioxins/Furans	Tetrachlorodibenzofurans		ug/L	
Dioxins/Furans	Tetrachlorodibenzo-p-dioxins		ug/L	
Dioxins/Furans	1,3,4,7,8-PeCDF		ug/L	
Dioxins/Furans	PCDDs (Dioxins)		ug/L	
Dioxins/Furans	2,3,7,8-TCDD	0.00003	ug/L	Primary MCL
Metals	Aluminum, Dissolved	13000	ug/L	SWGW RBSL
Metals	Boron, Dissolved	340	ug/L	SSFL Comparison
Metals	Tin, Dissolved	2.4	ug/L	SSFL Comparison
Metals	Antimony, Dissolved	2.5	ug/L	SSFL Comparison
Metals	Arsenic, Dissolved	7.7	ug/L	SSFL Comparison
Metals	Barium, Dissolved	150	ug/L	SSFL Comparison
Metals	Beryllium, Dissolved	0.14	ug/L	SSFL Comparison
Metals	Cadmium, Dissolved	0.2	ug/L	SSFL Comparison
Metals	Chromium, Dissolved	14	ug/L	SSFL Comparison
Metals	Cobalt, Dissolved	1.9	ug/L	SSFL Comparison
Metals	Copper, Dissolved	4.7	ug/L	SSFL Comparison
Metals	Hexavalent Chromium, Dissolved	38	ug/L	SWGW RBSL
Metals	Iron, Dissolved	4100	ug/L	SSFL Comparison
Metals	Lead, Dissolved	11	ug/L	SSFL Comparison
Metals	Magnesium, Dissolved	77000	ug/L	SSFL Comparison
Metals	Manganese, Dissolved	150	ug/L	SSFL Comparison
Metals	Mercury, Dissolved	0.063	ug/L	SSFL Comparison
Metals	Molybdenum, Dissolved	2.2	ug/L	SSFL Comparison
Metals	Nickel, Dissolved	17	ug/L	SSFL Comparison
Metals	Potassium, Dissolved	9600	ug/L	SSFL Comparison
Metals	Selenium, Dissolved	1.6	ug/L	SSFL Comparison
Metals	Silver, Dissolved	0.17	ug/L	SSFL Comparison
Metals	Sodium, Dissolved	190000	ug/L	SSFL Comparison
Metals	Strontium, Dissolved	800	ug/L	SSFL Comparison
Metals	Thallium, Dissolved	0.13	ug/L	SSFL Comparison
Metals	Vanadium, Dissolved	2.6	ug/L	SSFL Comparison
Metals	Zinc, Dissolved	6300	ug/L	SSFL Comparison
Metals	Zirconium		ug/L	
Metals	Zirconium, dissolved		ug/L	
Metals	Aluminum	200	ug/L	Secondary MCL
Metals	Antimony	2.5	ug/L	SSFL Comparison
Metals	Arsenic	7.7	ug/L	SSFL Comparison
Metals	Barium	150	ug/L	SSFL Comparison
Metals	Beryllium	0.14	ug/L	SSFL Comparison
Metals	Boron	340	ug/L	SSFL Comparison

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Metals	Cadmium	0.2	ug/L	SSFL Comparison
Metals	Chromium	14	ug/L	SSFL Comparison
Metals	Cobalt	1.9	ug/L	SSFL Comparison
Metals	Copper	4.7	ug/L	SSFL Comparison
Metals	Hexavalent Chromium	14	ug/L	SSFL Comparison
Metals	Iron	4100	ug/L	SSFL Comparison
Metals	Lead	11	ug/L	SSFL Comparison
Metals	Magnesium	77000	ug/L	SSFL Comparison
Metals	Manganese	150	ug/L	SSFL Comparison
Metals	Mercury	0.063	ug/L	SSFL Comparison
Metals	Molybdenum	2.2	ug/L	SSFL Comparison
Metals	Nickel	17	ug/L	SSFL Comparison
Metals	Potassium	9600	ug/L	SSFL Comparison
Metals	Selenium	1.6	ug/L	SSFL Comparison
Metals	Silver	0.17	ug/L	SSFL Comparison
Metals	Sodium	190000	ug/L	SSFL Comparison
Metals	Strontium	800	ug/L	SSFL Comparison
Metals	Thallium	0.13	ug/L	SSFL Comparison
Metals	Tin	2.4	ug/L	SSFL Comparison
Metals	Vanadium	2.6	ug/L	SSFL Comparison
Metals	Zinc	6300	ug/L	SSFL Comparison
Inorganics	Carbon Dioxide		ug/L	
Inorganics	Dissolved Organic Carbon		ug/L	
Inorganics	Phosphite (PO3)		ug/L	
Inorganics	Bicarbonate		ug/L	
Inorganics	Calcium, Dissolved		ug/L	
Inorganics	Carbonate		ug/L	
Inorganics	Chlorine	4000	ug/L	Primary MCL
Inorganics	Iron Oxide		ug/L	
Inorganics	Nitrate-NO3	45000	ug/L	Cal MCL
Inorganics	Redox Potential		mV	
Inorganics	Silica, Dissolved		ug/L	
Inorganics	Silicon, Dissolved		ug/L	
Inorganics	Specific gravity		No Units	
Inorganics	Sulfide, Dissolved		ug/L	
Inorganics	Alkalinity		ug/L	
Inorganics	Alkalinity as CaCO3		ug/L	
Inorganics	Ammonia-N		ug/L	
Inorganics	Bicarbonate Alkalinity as CaCO3		ug/L	
Inorganics	Bromide		ug/L	
Inorganics	Carbonate Alkalinity as CaCO3		ug/L	
Inorganics	Calcium		ug/L	
Inorganics	Cation/Anion Balance (%)		%	
Inorganics	Chloride	250000	ug/L	Secondary MCL
Inorganics	Chlorate	0.8	ug/L	Notification Level
Inorganics	Dissolved oxygen		ug/L	
Inorganics	Cyanides	150	ug/L	Cal MCL
Inorganics	Fluoride	800	ug/L	SSFL Comparison
Inorganics	Nitrate-N	10000	ug/L	Primary MCL
Inorganics	Nitrite-N	1000	ug/L	Primary MCL
Inorganics	Phosphate		ug/L	
Inorganics	Sulfate	376000	ug/L	SSFL Comparison
Inorganics	Sulfide		ug/L	
Inorganics	Total Dissolved Solids	500000	ug/L	Recommended SMCL
Inorganics	Total Dissolved Solids	1000000	ug/L	Upper SMCL

TABLE 8
GROUNDWATER SCREENING REFERENCE VALUES SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA

Analyte Group	Chemical Analyte	Screening Value	Units	Screening Type
Inorganics	Total Dissolved Solids	1500000	ug/L	Short-Term SMCL
Inorganics	Total Kjeldahl nitrogen		ug/L	
Inorganics	Total Organic Carbon		ug/L	
Inorganics	Total Suspended Solids		ug/L	
General Parameters	Ammonium		ug/L	
General Parameters	Bulk Density		pcf	
General Parameters	Deuterium		permil	
General Parameters	Formic Acid	1700000	ug/L	Taste/Odor
General Parameters	Hydraulic Conductivity		cm/sec	
General Parameters	Moisture		%	
General Parameters	Oxygen-18		permil	
General Parameters	pH		pH Units	
General Parameters	Porosity, Total		%	
General Parameters	Total Non-Volatile Solids		ug/L	
General Parameters	Total Solids		ug/L	
General Parameters	volumetric saturation (air)		%	
General Parameters	Turbidity	5	NTU	Secondary MCL
General Parameters	Specific conductivity	900	umhos/cm	Recommended SMCL
General Parameters	Specific conductivity	1600	umhos/cm	Upper SMCL
General Parameters	Specific conductivity	2200	umhos/cm	Short-Term SMCL
General Parameters	Hardness		ug/L	
General Parameters	Coliform bacteria		ml	

NOTES AND ABBREVIATIONS

VOCs - volatile organic compounds
SVOC - semi volatile organic compound
PAH - polycyclic aromatic hydrocarbon
NDMA - n-Nitrosodimethylamine
TPH - total petroleum hydrocarbons
PCB - polychlorinated biphenyl

Primary MCL - Primary Maximum Contaminant Level
Cal MCL - California Primary Maximum Contaminant Level
Secondary MCL - Secondary Maximum Contaminant Level
SMCL - Secondary Maximum Contaminant Level
Taste/Odor - Taste/Odor Threshold
SSFL Comparison - site-specific values for metals developed by DTSC
SWGW RBSL - Site-Wide Groundwater Risk-Based Screening Level proposed in GW RI Report (MWH, 2009)

ug/L - micrograms per liter
pCi/L - picocuries per liter
mrem/yr - millirem per year
NTU - nephelometric turbidity units
umhos/cm - micromhos per centimeter

(a) - isotope-specific MCL for beta emitters based on Primary MCL of 4 mrem/yr critical organ dose limit for gross beta (EPA, 2000)
(b) - isotope-specific MCL for beta emitters based on the 4 mrem/yr effective dose equivalent for gross beta (EPA, 2000)

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
1,1-dichloroethene	RD-23	Total	30	ug/l	J/J	No	Yes	02/05/2000	6	ug/L	Yes
1,4-dioxane	DS-46	Total	1.5	ug/l		No	Yes	06/01/2016	1	ug/L	Yes
	RD-34B	Total	0.48	ug/l	J/J	Yes	Yes		1	ug/L	No
Acetone	RD-59A	Total	8.2	ug/l	J/J	No	Yes	02/28/2007	20000	ug/L	No
	RD-59C	Total	3.7	ug/l	J/J	Yes	Yes		20000	ug/L	No
	RD-98	Total	8.7	ug/l	J/J	No	Yes	06/01/2017	20000	ug/L	No
Actinium-228	RD-20	Total	36.6	pci/l		Yes	Yes				
Aluminum	C-8	Total	0.11	mg/l		No	Yes	06/01/2017	200	ug/L	No
	DD-139	Total	0.47	mg/l	/J+	No	Yes	06/01/2017	200	ug/L	Yes
	DD-140	Dissolved	0.039	mg/l	J/J	No	Yes	06/01/2017	13000	ug/L	No
	DD-141	Dissolved	0.062	mg/l	J/J	No	Yes	06/01/2017	13000	ug/L	No
	DD-141	Total	2	mg/l		No	Yes	06/01/2016	200	ug/L	Yes
	DD-142	Total	0.98	mg/l	F1/J+	No	Yes	06/01/2017	200	ug/L	Yes
	DS-43	Dissolved	0.28	mg/l	B/	Yes	Yes		13000	ug/L	No
	PZ-108	Dissolved	0.036	mg/l	J/J	Yes	Yes		13000	ug/L	No
	PZ-108	Total	0.29	mg/l		Yes	Yes		200	ug/L	Yes
	PZ-120	Dissolved	0.097	mg/l	J/J	Yes	Yes		13000	ug/L	No
	PZ-120	Total	1.6	mg/l		No	Yes	06/01/2017	200	ug/L	Yes
	RD-33A	Total	0.018	mg/l	J/J	Yes	Yes		200	ug/L	No
	RD-54A	Dissolved	0.043	mg/l	J/J	Yes	Yes		13000	ug/L	No
	RD-54A	Total	2.3	mg/l		No	Yes	06/01/2017	200	ug/L	Yes
Antimony	DD-141	Dissolved	0.002	mg/l	U/	Yes	Yes		2.5	ug/L	No
	DS-46	Dissolved	0.00068	mg/l	J/J	Yes	Yes		2.5	ug/L	No
	DS-46	Total	0.00068	mg/l	J/J	Yes	Yes		2.5	ug/L	No
	PZ-120	Total	0.0015	mg/l	J/J	No	Yes	06/01/2017	2.5	ug/L	No
Arsenic	DD-141	Dissolved	0.00085	mg/l	J/J	No	Yes	06/01/2017	7.7	ug/L	No
	DD-141	Total	0.0015	mg/l	J/J	No	Yes	06/01/2016	7.7	ug/L	No
	DD-142	Total	0.0011	mg/l	J/J	No	Yes	06/01/2016	7.7	ug/L	No
	DD-144	Dissolved	0.00092	mg/l	J/J	Yes	Yes		7.7	ug/L	No
	DS-46	Total	0.00038	mg/l	J/J	Yes	Yes		7.7	ug/L	No
	PZ-120	Total	0.0028	mg/l	J/J	No	Yes	06/01/2017	7.7	ug/L	No
	RD-33A	Total	0.0032	mg/l	J/J	No	Yes	06/01/2016	7.7	ug/L	No
Barium	C-8	Dissolved	0.052	mg/l		No	Yes	06/01/2017	150	ug/L	No
	DS-46	Dissolved	0.057	mg/l		No	Yes	06/01/2017	150	ug/L	No
	DS-46	Total	0.052	mg/l		No	Yes	06/01/2017	150	ug/L	No
	PZ-105	Total	0.032	mg/l		No	Yes	02/11/2014	150	ug/L	No
	PZ-108	Dissolved	0.026	mg/l		No	Yes	06/01/2015	150	ug/L	No
	PZ-120	Dissolved	0.014	mg/l		No	Yes	02/11/2014	150	ug/L	No
	PZ-120	Total	0.046	mg/l		No	Yes	06/01/2017	150	ug/L	No
	RD-07	Dissolved	0.036	mg/l		No	Yes	06/01/2015	150	ug/L	No
	RD-17	Dissolved	0.12	mg/l		No	Yes	02/10/2014	150	ug/L	No
	RD-17	Total	0.13	mg/l	B/	No	Yes	02/10/2014	150	ug/L	No
Beryllium	DD-141	Dissolved	0.00021	mg/l	J/J	Yes	Yes		0.14	ug/L	Yes
	DD-141	Total	0.00017	mg/l	J/J	No	Yes	06/01/2016	0.14	ug/L	Yes
	DD-142	Total	0.00011	mg/l	J/J	Yes	Yes		0.14	ug/L	No
	DD-143	Total	0.00013	mg/l	J/J	No	Yes	06/01/2016	0.14	ug/L	No
	DD-144	Dissolved	0.00045	mg/l	J/J	Yes	Yes		0.14	ug/L	Yes
	DS-43	Total	0.00011	mg/l	J/J	Yes	Yes		0.14	ug/L	No
	DS-44	Dissolved	0.000096	mg/l	J/J	Yes	Yes		0.14	ug/L	No
	PZ-120	Total	0.00012	mg/l	J/J	Yes	Yes		0.14	ug/L	No
	RD-33A	Total	0.00012	mg/l	J/J	Yes	Yes		0.14	ug/L	No
Boron	DD-139	Total	0.035	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	DD-140	Dissolved	0.03	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	DD-140	Total	0.035	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	DD-143	Dissolved	0.085	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	DD-143	Total	0.083	mg/l	J/J	No	Yes	06/01/2016	340	ug/L	No
	DD-144	Dissolved	0.14	mg/l	B/	No	Yes	06/01/2017	340	ug/L	No
	DS-43	Dissolved	0.16	mg/l	B/	No	Yes	06/01/2017	340	ug/L	No
	DS-43	Total	0.16	mg/l		No	Yes	06/01/2017	340	ug/L	No
	DS-44	Total	0.09	mg/l	J/J	Yes	Yes		340	ug/L	No
	DS-46	Total	0.038	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	DS-47	Dissolved	0.039	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	DS-47	Total	0.042	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	PZ-108	Dissolved	0.17	mg/l	B/	Yes	Yes		340	ug/L	No
	PZ-108	Total	0.18	mg/l		Yes	Yes		340	ug/L	No

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
Boron	PZ-120	Dissolved	1.4	mg/l		No	Yes	06/01/2017	340	ug/L	Yes
	RD-07	Total	0.088	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-17	Dissolved	0.15	mg/l		Yes	Yes		340	ug/L	No
	RD-17	Total	0.14	mg/l		Yes	Yes		340	ug/L	No
	RD-33A	Dissolved	0.021	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-33A	Total	0.024	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-33B	Dissolved	0.024	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-33C	Dissolved	0.032	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-34B	Total	0.021	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-34C	Total	0.021	mg/l	J/J	Yes	Yes		340	ug/L	No
	RD-54A	Dissolved	0.025	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-59B	Dissolved	0.074	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-96	Dissolved	0.025	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
	RD-96	Total	0.028	mg/l	J/J	No	Yes	06/01/2017	340	ug/L	No
Cadmium	PZ-120	Total	0.00034	mg/l	J/J	Yes	Yes		0.2	ug/L	Yes
Calcium	DD-139	Dissolved	110	mg/l	B/	No	Yes	06/01/2017			
	DD-139	Total	110	mg/l		No	Yes	06/01/2017			
	DD-140	Dissolved	100	mg/l		No	Yes	06/01/2017			
	DD-140	Total	110	mg/l		No	Yes	06/01/2017			
	DD-142	Total	110	mg/l		No	Yes	06/01/2017			
	DD-143	Dissolved	170	mg/l		No	Yes	06/01/2017			
	DD-143	Total	160	mg/l		No	Yes	06/01/2016			
	DD-144	Dissolved	120	mg/l	B/	No	Yes	06/01/2017			
	DS-43	Total	86	mg/l		No	Yes	06/01/2017			
	DS-44	Total	110	mg/l		No	Yes	06/01/2017			
	DS-46	Dissolved	120	mg/l		No	Yes	06/01/2017			
	DS-46	Total	130	mg/l		No	Yes	06/01/2017			
	DS-47	Dissolved	79	mg/l		No	Yes	06/01/2017			
	DS-47	Total	85	mg/l		No	Yes	06/01/2017			
	PZ-105	Total	110	mg/l		No	Yes	06/01/2017			
	PZ-108	Dissolved	130	mg/l		Yes	Yes				
	PZ-108	Total	140	mg/l		Yes	Yes				
	PZ-120	Total	73	mg/l		No	Yes	04/02/2003			
	RD-07	Total	97	mg/l		No	Yes	06/01/2017			
	RD-17	Dissolved	100	mg/l		No	Yes	09/21/1989			
	RD-17	Total	100	mg/l		Yes	Yes				
	RD-19	Total	210	mg/l		No	Yes	06/01/2017			
	RD-21	Dissolved	110	mg/l		No	Yes	09/12/1989			
	RD-21	Total	110	mg/l		No	Yes	06/01/2017			
	RD-33A	Total	65	mg/l		No	Yes	06/01/2016			
	RD-34A	Dissolved	160	mg/l		No	Yes	06/01/2017			
	RD-34C	Total	49	mg/l		No	Yes	06/01/2017			
	RD-54A	Total	110	mg/l		No	Yes	06/01/2017			
	RD-96	Total	120	mg/l		No	Yes	06/01/2017			
Chromium	DD-141	Total	0.005	mg/l		No	Yes	06/01/2016	14	ug/L	No
	DD-142	Total	0.0025	mg/l		No	Yes	06/01/2016	14	ug/L	No
	DD-144	Dissolved	0.00061	mg/l	J/J	Yes	Yes		14	ug/L	No
	PZ-105	Total	0.0051	mg/l	B/	No	Yes	06/01/2017	14	ug/L	No
	PZ-108	Dissolved	0.0016	mg/l	J/J	No	Yes	01/31/2012	14	ug/L	No
	PZ-120	Dissolved	0.0045	mg/l		No	Yes	06/01/2017	14	ug/L	No
	PZ-120	Total	0.011	mg/l		No	Yes	06/01/2017	14	ug/L	No
	RD-19	Total	0.00065	mg/l	J/J	No	Yes	06/01/2016	14	ug/L	No
	RD-54A	Total	0.0053	mg/l		No	Yes	06/01/2017	14	ug/L	No
cis-1,2-Dichloroethene	C-8	Total	4.8	ug/l		No	Yes	06/01/2017	6	ug/L	No
Cobalt	C-8	Dissolved	0.00073	mg/l	J/J	No	Yes	06/01/2017	1.9	ug/L	No
	C-8	Total	0.00095	mg/l	J/J	No	Yes	06/01/2017	1.9	ug/L	No
	DD-141	Total	0.01	mg/l		No	Yes	06/01/2017	1.9	ug/L	Yes
	DD-142	Total	0.00092	mg/l	J/J	No	Yes	06/01/2016	1.9	ug/L	No
	DD-143	Dissolved	0.00022	mg/l	J/J	No	Yes	06/01/2017	1.9	ug/L	No
	DD-144	Dissolved	0.00067	mg/l	J/J	No	Yes	06/01/2017	1.9	ug/L	No
	DS-44	Dissolved	0.00034	mg/l	J/J	No	Yes	06/01/2016	1.9	ug/L	No
	PZ-105	Dissolved	0.000062	mg/l	J/J	Yes	Yes		1.9	ug/L	No
	PZ-105	Total	0.00036	mg/l	J/J	No	Yes	06/01/2017	1.9	ug/L	No
	PZ-108	Dissolved	0.00012	mg/l	J/J	No	Yes	07/18/2011	1.9	ug/L	No
	PZ-120	Dissolved	0.00035	mg/l	J/J	No	Yes	06/01/2017	1.9	ug/L	No

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
	PZ-120	Total	0.0025	mg/l		No	Yes	04/02/2003	1.9	ug/L	Yes
	RD-17	Dissolved	0.0015	mg/l		No	Yes	02/10/2014	1.9	ug/L	No
	RD-17	Total	0.0016	mg/l		No	Yes	02/10/2014	1.9	ug/L	No
	RD-34A	Total	0.0018	mg/l		No	Yes	01/28/2013	1.9	ug/L	No
	RD-54A	Total	0.0067	mg/l		No	Yes	06/01/2017	1.9	ug/L	Yes
Cobalt-57	RD-19	Dissolved	7.38	pci/l		Yes	Yes		1000	pCi/L	No
Cobalt-60	PZ-120	Total	7.26	pci/l		Yes	Yes		100	pCi/L	No
	RD-59A	Dissolved	8.29	pci/l		Yes	Yes		100	pCi/L	No
	RD-96	Total	10.7	pci/l		Yes	Yes		100	pCi/L	No
Copper	DD-142	Total	0.0035	mg/l	B/	No	Yes	06/01/2016	4.7	ug/L	No
	DD-143	Total	0.0013	mg/l	J/J	No	Yes	06/01/2017	4.7	ug/L	No
	DD-144	Dissolved	0.00061	mg/l	J/J	Yes	Yes		4.7	ug/L	No
	DS-44	Dissolved	0.00056	mg/l	J/J	Yes	Yes		4.7	ug/L	No
	DS-46	Dissolved	0.0016	mg/l	J/J	No	Yes	06/01/2017	4.7	ug/L	No
	DS-46	Total	0.0014	mg/l	J/J	Yes	Yes		4.7	ug/L	No
	PZ-105	Total	0.0021	mg/l		No	Yes	06/01/2017	4.7	ug/L	No
	PZ-108	Dissolved	0.0016	mg/l	J/J	No	Yes	01/31/2012	4.7	ug/L	No
	PZ-120	Dissolved	0.0045	mg/l		No	Yes	06/01/2017	4.7	ug/L	No
	PZ-120	Total	0.046	mg/l		No	Yes	04/02/2003	4.7	ug/L	Yes
	RD-54A	Total	0.035	mg/l		No	Yes	06/01/2017	4.7	ug/L	Yes
Diesel Range Organics [C10-C28]	PZ-105	Total	520	ug/l		No	Yes	06/01/2017	0.1	mg/L	Yes
	RD-14	Total	43	ug/l	J/J	No	Yes	06/01/2016	0.1	mg/L	No
	RD-54A	Total	58	ug/l	J/J	Yes	Yes		0.1	mg/L	No
	RD-63	Total	46	ug/l	J/J	Yes	Yes		0.1	mg/L	No
	RD-96	Total	51	ug/l	J/J	No	Yes	06/01/2016	0.1	mg/L	No
Europium-152	RD-34B	Total	22.2	pci/l		Yes	Yes		200	pCi/L	No
Europium-154	RD-34B	Dissolved	44.9	pci/l		Yes	Yes		200	pCi/L	No
	RD-98	Total	46.1	pci/l		Yes	Yes		200	pCi/L	No
Fluoride	RD-19	Total	0.41	mg/l	J/J	No	Yes	07/18/2011	800	ug/L	No
	RD-34B	Total	0.69	mg/l		No	Yes	06/01/2017	800	ug/L	No
Gasoline Range Organics	DD-141	Total	55	ug/l	F1/J	Yes	Yes		5	ug/L	Yes
	PZ-105	Total	11	ug/l	J/J	Yes	Yes		5	ug/L	Yes
	RD-54A	Total	57	ug/l	/J	Yes	Yes		5	ug/L	Yes
Gross Alpha	DD-141	Total	19	pci/l	C/	No	Yes	06/01/2017	15	pCi/L	Yes
	PZ-120	Dissolved	7.47	pci/l	C/	Yes	Yes		15	pCi/L	No
	RD-33C	Total	7.1	pci/l		No	Yes	07/24/2009	15	pCi/L	No
	RD-59C	Total	3.86	pci/l		No	Yes	08/04/2009	15	pCi/L	No
	RD-63	Total	15.9	pci/l	C/	No	Yes	02/02/2010	15	pCi/L	Yes
Gross Beta	DD-141	Total	18.9	pci/l		No	Yes	06/01/2017	50	pCi/L	No
	DS-44	Total	11.9	pci/l		No	Yes	06/01/2016	50	pCi/L	No
Iron	C-8	Total	0.32	mg/l		No	Yes	06/01/2016	4100	ug/L	No
	DD-139	Total	1.4	mg/l	/J+	No	Yes	06/01/2017	4100	ug/L	No
	DD-141	Total	3.3	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	DD-142	Total	1.5	mg/l	F1/J+	No	Yes	06/01/2017	4100	ug/L	No
	DD-144	Dissolved	4.5	mg/l	B/	No	Yes	06/01/2017	4100	ug/L	Yes
	DD-145	Dissolved	0.11	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	DS-44	Dissolved	0.24	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	DS-46	Dissolved	0.87	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	PZ-105	Total	0.64	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	PZ-108	Dissolved	0.094	mg/l	J/J	Yes	Yes		4100	ug/L	No
	PZ-108	Total	0.49	mg/l		Yes	Yes		4100	ug/L	No
	PZ-120	Dissolved	0.18	mg/l		Yes	Yes		4100	ug/L	No
	PZ-120	Total	2.4	mg/l		No	Yes	04/02/2003	4100	ug/L	No
	RD-17	Dissolved	6.2	mg/l		Yes	Yes		4100	ug/L	Yes
	RD-17	Total	7.4	mg/l		Yes	Yes		4100	ug/L	Yes
	RD-33B	Total	0.74	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	RD-33C	Dissolved	2.1	mg/l		No	Yes	02/15/2002	4100	ug/L	No
	RD-34B	Total	0.57	mg/l		No	Yes	06/01/2017	4100	ug/L	No
	RD-34C	Dissolved	1.6	mg/l		No	Yes	02/14/2002	4100	ug/L	No
	RD-59C	Total	0.022	mg/l	J/J	No	Yes	12/04/2003	4100	ug/L	No
	RD-96	Total	0.057	mg/l	J/J	No	Yes	06/01/2017	4100	ug/L	No
	C-8	Total	0.00025	mg/l	J^/J+	Yes	Yes		11	ug/L	No

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
Lead	DD-142	Total	0.0013	mg/l	B/	No	Yes	06/01/2016	11	ug/L	No
	DD-143	Total	0.0011	mg/l		No	Yes	06/01/2017	11	ug/L	No
	DD-144	Dissolved	0.00053	mg/l	J/J	No	Yes	06/01/2017	11	ug/L	No
	DS-43	Dissolved	0.00024	mg/l	J/J	Yes	Yes		11	ug/L	No
	DS-44	Dissolved	0.00032	mg/l	J/J	No	Yes	06/01/2016	11	ug/L	No
	PZ-105	Total	0.00038	mg/l	J/J	No	Yes	06/01/2017	11	ug/L	No
	PZ-120	Dissolved	0.0012	mg/l	B/	Yes	Yes		11	ug/L	No
	PZ-120	Total	0.02	mg/l		No	Yes	06/01/2017	11	ug/L	Yes
	RD-17	Total	0.0083	mg/l		No	Yes	02/10/2014	11	ug/L	No
Magnesium	DD-139	Dissolved	15	mg/l	B/	No	Yes	06/01/2017	77000	ug/L	No
	DD-139	Total	15	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DD-140	Dissolved	21	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DD-140	Total	22	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DD-141	Total	26	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DD-142	Total	22	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DD-143	Total	31	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DS-44	Total	21	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DS-46	Dissolved	18	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DS-46	Total	19	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DS-47	Dissolved	19	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	DS-47	Total	20	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	PZ-105	Total	21	mg/l	/J	No	Yes	06/01/2017	77000	ug/L	No
	PZ-108	Dissolved	31	mg/l	/J	Yes	Yes		77000	ug/L	No
	PZ-108	Total	33	mg/l	/J	Yes	Yes		77000	ug/L	No
	RD-07	Total	14	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	RD-17	Dissolved	23	mg/l		No	Yes	09/21/1989	77000	ug/L	No
	RD-17	Total	22	mg/l		Yes	Yes		77000	ug/L	No
	RD-19	Total	42	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	RD-21	Dissolved	6.9	mg/l	/J	No	Yes	09/12/1989	77000	ug/L	No
	RD-21	Total	6.8	mg/l	/J	No	Yes	06/01/2017	77000	ug/L	No
	RD-33A	Total	14	mg/l		No	Yes	06/01/2016	77000	ug/L	No
	RD-54A	Total	8.7	mg/l		No	Yes	06/01/2017	77000	ug/L	No
	RD-96	Total	37	mg/l		No	Yes	06/01/2017	77000	ug/L	No
Manganese	DD-139	Dissolved	0.01	mg/l		Yes	Yes		150	ug/L	No
	DD-139	Total	0.057	mg/l	^/J+	No	Yes	06/01/2017	150	ug/L	No
	DD-140	Dissolved	0.1	mg/l	F1/J-	No	Yes	06/01/2017	150	ug/L	No
	DD-140	Total	0.1	mg/l		No	Yes	06/01/2017	150	ug/L	No
	DD-141	Total	0.43	mg/l		No	Yes	06/01/2016	150	ug/L	Yes
	DD-142	Total	0.18	mg/l	^/	No	Yes	06/01/2017	150	ug/L	Yes
	DD-143	Dissolved	0.074	mg/l	/J	No	Yes	06/01/2017	150	ug/L	No
	DD-145	Dissolved	0.023	mg/l		No	Yes	06/01/2017	150	ug/L	No
	DS-44	Dissolved	0.089	mg/l	B/	No	Yes	06/01/2017	150	ug/L	No
	DS-44	Total	0.19	mg/l	^/J	No	Yes	06/01/2017	150	ug/L	Yes
	DS-47	Dissolved	0.0015	mg/l	B/J+	Yes	Yes		150	ug/L	No
	PZ-105	Total	0.035	mg/l		No	Yes	06/01/2017	150	ug/L	No
	PZ-108	Dissolved	0.049	mg/l		Yes	Yes		150	ug/L	No
	PZ-108	Total	0.065	mg/l		Yes	Yes		150	ug/L	No
	PZ-120	Dissolved	0.069	mg/l	/J	Yes	Yes		150	ug/L	No
	PZ-120	Total	1.1	mg/l		No	Yes	04/02/2003	150	ug/L	Yes
	RD-07	Total	0.0045	mg/l		No	Yes	06/01/2017	150	ug/L	No
	RD-17	Dissolved	0.18	mg/l		Yes	Yes		150	ug/L	Yes
	RD-17	Total	0.18	mg/l	B/	Yes	Yes		150	ug/L	Yes
	RD-33A	Total	0.018	mg/l	B/	No	Yes	06/01/2016	150	ug/L	No
	RD-33B	Total	0.034	mg/l	^/	No	Yes	06/01/2017	150	ug/L	No
	RD-33C	Dissolved	0.16	mg/l	B/	No	Yes	02/15/2002	150	ug/L	Yes
	RD-34A	Dissolved	0.13	mg/l		No	Yes	05/16/2003	150	ug/L	No
	RD-34A	Total	0.18	mg/l	B/	No	Yes	06/01/2017	150	ug/L	Yes
	RD-34C	Dissolved	0.047	mg/l		No	Yes	02/24/2004	150	ug/L	No
	RD-59A	Total	0.35	mg/l	B/	No	Yes	06/01/2017	150	ug/L	Yes
Mercury	RD-54A	Total	0.00023	mg/l		No	Yes	06/01/2017	0.063	ug/L	Yes
	DD-140	Dissolved	0.0045	mg/l		No	Yes	06/01/2017	2.2	ug/L	Yes
	DD-140	Total	0.0042	mg/l		No	Yes	06/01/2017	2.2	ug/L	Yes
	DD-144	Dissolved	0.0015	mg/l	J/J	No	Yes	06/01/2017	2.2	ug/L	No
	DD-145	Dissolved	0.0022	mg/l		No	Yes	06/01/2017	2.2	ug/L	No
	DS-43	Total	0.0028	mg/l		No	Yes	06/01/2017	2.2	ug/L	Yes

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
Molybdenum	DS-44	Total	0.0081	mg/l		No	Yes	06/01/2017	2.2	ug/L	Yes
	DS-46	Dissolved	0.00051	mg/l	J/J	Yes	Yes		2.2	ug/L	No
	PZ-108	Dissolved	0.0085	mg/l		Yes	Yes		2.2	ug/L	Yes
	PZ-108	Total	0.0081	mg/l	B/	Yes	Yes		2.2	ug/L	Yes
	PZ-120	Dissolved	0.017	mg/l		No	Yes	06/01/2017	2.2	ug/L	Yes
	RD-17	Dissolved	0.00058	mg/l	J/J	Yes	Yes		2.2	ug/L	No
	RD-17	Total	0.00053	mg/l	J/J	Yes	Yes		2.2	ug/L	No
	RD-19	Dissolved	0.00076	mg/l	J/J	No	Yes	06/01/2017	2.2	ug/L	No
	RD-19	Total	0.00075	mg/l	J/J	No	Yes	06/01/2017	2.2	ug/L	No
	RD-21	Total	0.0023	mg/l	B/	No	Yes	06/01/2017	2.2	ug/L	Yes
	RD-33A	Total	0.0013	mg/l	J/J	No	Yes	06/01/2017	2.2	ug/L	No
	RD-33B	Total	0.0022	mg/l		No	Yes	06/01/2017	2.2	ug/L	No
	RD-34B	Dissolved	0.0025	mg/l		No	Yes	02/06/2003	2.2	ug/L	Yes
	RD-59A	Total	0.0024	mg/l		No	Yes	06/01/2017	2.2	ug/L	Yes
	RD-59B	Total	0.0015	mg/l	J/J	No	Yes	06/01/2017	2.2	ug/L	No
	RD-59C	Total	0.0012	mg/l	J/J	No	Yes	06/01/2017	2.2	ug/L	No
Nickel	DD-141	Total	0.0055	mg/l		No	Yes	06/01/2016	17	ug/L	No
	DD-142	Total	0.0018	mg/l	J/J	No	Yes	06/01/2016	17	ug/L	No
	DD-143	Dissolved	0.00092	mg/l	J/J	No	Yes	06/01/2017	17	ug/L	No
	DD-144	Dissolved	0.0026	mg/l		No	Yes	06/01/2016	17	ug/L	No
	PZ-105	Total	0.0014	mg/l	J/J	No	Yes	06/01/2017	17	ug/L	No
	PZ-108	Dissolved	0.0023	mg/l		No	Yes	01/31/2012	17	ug/L	No
	PZ-120	Total	0.012	mg/l		No	Yes	02/11/2014	17	ug/L	No
	RD-07	Total	0.00037	mg/l	J/J	No	Yes	06/01/2016	17	ug/L	No
	RD-17	Dissolved	0.0011	mg/l	J/J	No	Yes	02/10/2014	17	ug/L	No
	RD-33A	Total	0.003	mg/l		No	Yes	06/01/2016	17	ug/L	No
	RD-96	Total	0.0026	mg/l		No	Yes	06/01/2017	17	ug/L	No
Nitrate-NO3	DD-145	Total	4.2	mg/l		Yes	Yes		45000	ug/L	No
	PZ-105	Total	4.4	mg/l		Yes	Yes		45000	ug/L	No
Perchlorate	RD-33B	Total	0.017	ug/l	J/J	Yes	Yes		6	ug/L	No
Potassium	DD-139	Dissolved	4.8	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	DD-139	Total	4.5	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	DD-142	Total	4.5	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	DS-43	Total	6.2	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	DS-44	Total	4.6	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	DS-46	Total	4.9	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	PZ-105	Total	6.4	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	PZ-108	Dissolved	7	mg/l		Yes	Yes		9600	ug/L	No
	PZ-108	Total	7.6	mg/l		Yes	Yes		9600	ug/L	No
	RD-34A	Dissolved	4.3	mg/l		No	Yes	06/01/2017	9600	ug/L	No
	RD-96	Total	5.1	mg/l		No	Yes	06/01/2017	9600	ug/L	No
Radium-226	DD-141	Total	2.5	pci/l		No	Yes	06/01/2016	5	pCi/L	No
	DS-44	Total	0.906	pci/l		No	Yes	06/01/2016	5	pCi/L	No
	DS-47	Dissolved	0.464	pci/l	/J	No	Yes	06/01/2017	5	pCi/L	No
	RD-33B	Total	0.512	pci/l		Yes	Yes		5	pCi/L	No
	RD-34A	Total	0.677	pci/l		No	Yes	06/01/2016	5	pCi/L	No
	RD-34B	Total	0.235	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	RD-96	Dissolved	1.11	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	RD-98	Dissolved	0.206	pci/l		Yes	Yes		5	pCi/L	No
	RD-98	Total	0.275	pci/l		Yes	Yes		5	pCi/L	No
Radium-228	DD-141	Total	4.22	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	DD-143	Dissolved	3.64	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	DS-44	Total	2.14	pci/l	/J	No	Yes	06/01/2016	5	pCi/L	No
	RD-14	Dissolved	1.25	pci/l		No	Yes	10/31/1989	5	pCi/L	No
	RD-14	Total	1.31	pci/l		No	Yes	06/01/2016	5	pCi/L	No
	RD-19	Dissolved	3.02	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	RD-20	Dissolved	1.15	pci/l		No	Yes	06/01/2016	5	pCi/L	No
	RD-20	Total	2.94	pci/l		Yes	Yes		5	pCi/L	No
	RD-33B	Total	2.92	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	RD-33C	Total	4.55	pci/l		No	Yes	06/01/2017	5	pCi/L	No
	RD-34B	Total	0.622	pci/l		Yes	Yes		5	pCi/L	No
	RD-63	Total	2.34	pci/l		No	Yes	06/01/2016	5	pCi/L	No
	RD-96	Dissolved	1.61	pci/l	/J	No	Yes	06/01/2017	5	pCi/L	No
Selenium	PZ-105	Total	0.0015	mg/l	J/J	No	Yes	06/01/2017	1.6	ug/L	No
	DD-141	Dissolved	0.000033	mg/l	J/J	Yes	Yes		0.17	ug/L	No

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
Silver	DD-141	Total	0.000064	mg/l	J/J	Yes	Yes		0.17	ug/L	No
	DD-144	Dissolved	0.000039	mg/l	J/J	Yes	Yes		0.17	ug/L	No
	PZ-108	Dissolved	0.000036	mg/l	J/J	Yes	Yes		0.17	ug/L	No
	RD-54A	Total	0.000037	mg/l	J/J	No	Yes	06/01/2017	0.17	ug/L	No
	RD-96	Total	0.000075	mg/l	J/J	No	Yes	06/01/2017	0.17	ug/L	No
Sodium	DD-140	Dissolved	43	mg/l		No	Yes	06/01/2017	190000	ug/L	No
	DD-140	Total	46	mg/l		No	Yes	06/01/2017	190000	ug/L	No
	DD-144	Total	71	mg/l		No	Yes	06/01/2017	190000	ug/L	No
	DS-43	Total	150	mg/l		No	Yes	06/01/2016	190000	ug/L	No
	DS-47	Total	39	mg/l		No	Yes	06/01/2016	190000	ug/L	No
	PZ-108	Dissolved	82	mg/l		No	Yes	06/01/2015	190000	ug/L	No
	PZ-108	Total	81	mg/l	B/	No	Yes	06/01/2015	190000	ug/L	No
	RD-17	Dissolved	41	mg/l		No	Yes	09/21/1989	190000	ug/L	No
	RD-17	Total	39	mg/l		Yes	Yes		190000	ug/L	No
	RD-21	Total	83	mg/l	B/	No	Yes	06/01/2016	190000	ug/L	No
	RD-33A	Total	48	mg/l		No	Yes	06/01/2016	190000	ug/L	No
Sodium-22	RD-07	Dissolved	6.33	pci/l		Yes	Yes		400	pCi/L	No
Strontium	DD-139	Dissolved	0.32	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-139	Total	0.31	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-140	Dissolved	0.28	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-140	Total	0.3	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-141	Dissolved	0.29	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-142	Total	0.3	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-143	Dissolved	0.35	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DD-143	Total	0.33	mg/l		No	Yes	06/01/2016	800	ug/L	No
	DD-144	Dissolved	0.26	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DS-43	Total	0.3	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DS-44	Total	0.29	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DS-46	Dissolved	0.34	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DS-46	Total	0.39	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DS-47	Dissolved	0.25	mg/l		No	Yes	06/01/2017	800	ug/L	No
	DS-47	Total	0.27	mg/l		No	Yes	06/01/2017	800	ug/L	No
	PZ-105	Total	0.49	mg/l		No	Yes	06/01/2017	800	ug/L	No
	PZ-108	Dissolved	0.34	mg/l		Yes	Yes		800	ug/L	No
	PZ-108	Total	0.36	mg/l		Yes	Yes		800	ug/L	No
	RD-07	Dissolved	0.24	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-07	Total	0.24	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-17	Dissolved	0.36	mg/l		No	Yes	09/21/1989	800	ug/L	No
	RD-17	Total	0.36	mg/l		Yes	Yes		800	ug/L	No
	RD-19	Total	0.45	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-21	Dissolved	0.29	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-21	Total	0.29	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-33A	Total	0.38	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-33C	Dissolved	0.44	mg/l		No	Yes	10/01/1991	800	ug/L	No
	RD-33C	Total	0.44	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-34A	Total	0.34	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-34B	Total	0.019	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-34C	Total	0.25	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-54A	Dissolved	0.32	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-54A	Total	0.32	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-59B	Dissolved	0.62	mg/l		No	Yes	06/01/2017	800	ug/L	No
	RD-96	Total	0.29	mg/l		No	Yes	06/01/2017	800	ug/L	No
Strontium-90	RD-33B	Dissolved	0.241	pci/l		Yes	Yes		8	pCi/L	No
	RD-34B	Dissolved	0.333	pci/l		Yes	Yes		8	pCi/L	No
	RD-59A	Dissolved	0.363	pci/l		Yes	Yes		8	pCi/L	No
	RD-98	Total	65.8	pci/l		No	Yes	11/14/2008	8	pCi/L	Yes
Thallium	DD-141	Total	0.00011	mg/l	J/J	No	Yes	06/01/2017	0.13	ug/L	No
	DD-142	Total	0.000058	mg/l	J/J	Yes	Yes		0.13	ug/L	No
	DD-144	Dissolved	0.00016	mg/l	J/J	Yes	Yes		0.13	ug/L	Yes
	DS-44	Dissolved	0.000093	mg/l	J/J	Yes	Yes		0.13	ug/L	No
	DS-47	Dissolved	0.000073	mg/l	J/J	Yes	Yes		0.13	ug/L	No
	RD-33A	Total	0.000068	mg/l	J/J	No	Yes	02/12/2014	0.13	ug/L	No
Tin	RD-33A	Total	0.00078	mg/l	J/J	Yes	Yes		2.4	ug/L	No
trans-1,2-Dichloroethene	RD-33A	Total	3.2	ug/l		No	Yes	06/01/2017	10	ug/L	No

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
trans-1,2-Dichloroethene	RD-65	Total	24	ug/l		No	Yes	06/01/2017	10	ug/L	Yes
Trichloroethene	C-8	Total	82	ug/l		No	Yes	06/01/2017	5	ug/L	Yes
	DD-140	Total	0.91	ug/l	J/J	Yes	Yes		5	ug/L	No
	DD-144	Total	200	ug/l		No	Yes	06/01/2016	5	ug/L	Yes
	RD-23	Total	1100	ug/l		No	Yes	07/16/2009	5	ug/L	Yes
Uranium-233/234	DD-141	Dissolved	1.77	pci/l		Yes	Yes		20	pCi/L	No
	DD-141	Total	2.22	pci/l		Yes	Yes		20	pCi/L	No
	DD-143	Dissolved	2.7	pci/l		Yes	Yes		20	pCi/L	No
	DD-143	Total	2.57	pci/l		Yes	Yes		20	pCi/L	No
	DS-44	Dissolved	2.99	pci/l		Yes	Yes		20	pCi/L	No
	DS-44	Total	3.25	pci/l	F/	Yes	Yes		20	pCi/L	No
	DS-47	Dissolved	1.67	pci/l		Yes	Yes		20	pCi/L	No
	DS-47	Total	2.49	pci/l	F/	Yes	Yes		20	pCi/L	No
	PZ-120	Total	2.82	pci/l		Yes	Yes		20	pCi/L	No
	RD-19	Dissolved	15.9	pci/l		No	Yes	07/18/2011	20	pCi/L	No
	RD-19	Total	16.7	pci/l		Yes	Yes		20	pCi/L	No
	RD-20	Total	4.54	pci/l	F/	Yes	Yes		20	pCi/L	No
	RD-33A	Total	2.35	pci/l	F/	Yes	Yes		20	pCi/L	No
	RD-33C	Dissolved	0.264	pci/l		No	Yes	01/25/2011	20	pCi/L	No
	RD-33C	Total	0.157	pci/l	F/	Yes	Yes		20	pCi/L	No
	RD-54A	Total	2.95	pci/l	F/	Yes	Yes		20	pCi/L	No
	RD-59A	Dissolved	2.12	pci/l		No	Yes	07/11/2011	20	pCi/L	No
	RD-59A	Total	1.72	pci/l		Yes	Yes		20	pCi/L	No
	RD-59B	Total	0.278	pci/l		Yes	Yes		20	pCi/L	No
	RD-59C	Total	0.214	pci/l		Yes	Yes		20	pCi/L	No
	RD-63	Total	4.4	pci/l	F/	Yes	Yes		20	pCi/L	No
	RD-96	Total	6.49	pci/l	F/	No	Yes	05/09/2006	20	pCi/L	No
	RD-98	Total	4.03	pci/l		Yes	Yes		20	pCi/L	No
	DD-141	Total	0.271	pci/l		Yes	Yes				
	DD-143	Dissolved	0.0849	pci/l		Yes	Yes				
	DS-44	Dissolved	0.174	pci/l		Yes	Yes				
	RD-07	Dissolved	0.219	pci/l		Yes	Yes				
	RD-07	Total	0.301	pci/l		Yes	Yes				
	RD-19	Dissolved	0.592	pci/l		Yes	Yes				
	RD-19	Total	0.761	pci/l		Yes	Yes				
	RD-20	Dissolved	0.185	pci/l		Yes	Yes				
	RD-20	Total	0.137	pci/l		Yes	Yes				
	RD-33A	Total	0.125	pci/l		Yes	Yes				
	RD-34A	Dissolved	0.255	pci/l		Yes	Yes				
	RD-34A	Total	0.416	pci/l		Yes	Yes				
	RD-54A	Total	0.161	pci/l		Yes	Yes				
	RD-63	Dissolved	0.214	pci/l		Yes	Yes				
	RD-63	Total	0.252	pci/l		Yes	Yes				
	RD-96	Total	0.323	pci/l		Yes	Yes				
	RD-98	Dissolved	0.274	pci/l		Yes	Yes				
	RD-98	Total	0.13	pci/l		Yes	Yes				
Uranium-238	PZ-120	Total	2.38	pci/l		Yes	Yes		20	pCi/L	No
	RD-07	Dissolved	2.36	pci/l		Yes	Yes		20	pCi/L	No
	RD-07	Total	2.96	pci/l		Yes	Yes		20	pCi/L	No
	RD-14	Dissolved	1.83	pci/l		No	Yes	06/01/2017	20	pCi/L	No
	RD-14	Total	1.41	pci/l		Yes	Yes		20	pCi/L	No
	RD-20	Dissolved	3.57	pci/l		Yes	Yes		20	pCi/L	No
	RD-20	Total	3.24	pci/l		Yes	Yes		20	pCi/L	No
	RD-33A	Dissolved	1.63	pci/l		Yes	Yes		20	pCi/L	No
	RD-34A	Dissolved	5.55	pci/l		Yes	Yes		20	pCi/L	No
	RD-34A	Total	5.74	pci/l		Yes	Yes		20	pCi/L	No
	RD-54A	Dissolved	2.3	pci/l		No	Yes	06/01/2017	20	pCi/L	No
	RD-54A	Total	2.84	pci/l		Yes	Yes		20	pCi/L	No
	RD-59A	Total	1.41	pci/l		No	Yes	06/01/2017	20	pCi/L	No
	RD-63	Dissolved	4	pci/l		Yes	Yes		20	pCi/L	No
	RD-63	Total	5.34	pci/l		Yes	Yes		20	pCi/L	No
	RD-96	Dissolved	5.34	pci/l		Yes	Yes		20	pCi/L	No
	RD-96	Total	4.99	pci/l		No	Yes	06/01/2017	20	pCi/L	No
	RD-98	Dissolved	2.37	pci/l		Yes	Yes		20	pCi/L	No

TABLE 9

FIRST TIME DETECTS AND NEW MAXIMUM CONCENTRATONS, Q1 2018 – AREA IV

Analyte	Well ID	Fraction	2018 Results	Units	Quaifier	New Detection?	New Max Detect?	Date of Max Detect	Screening Value	Screening Unit	2018 Result Greater Than Screening Value
Vanadium	DD-141	Total	0.0071	mg/l		No	Yes	06/01/2017	2.6	ug/L	Yes
	DD-142	Total	0.0052	mg/l		No	Yes	06/01/2016	2.6	ug/L	Yes
	PZ-120	Total	0.0069	mg/l		No	Yes	02/11/2014	2.6	ug/L	Yes
	RD-34A	Total	0.005	mg/l	U/	No	Yes	02/06/2008	2.6	ug/L	Yes
Zinc	DD-142	Total	0.013	mg/l	B/	No	Yes	06/01/2016	6300	ug/L	No
	DD-144	Dissolved	0.003	mg/l	J/J	No	Yes	06/01/2016	6300	ug/L	No
	DS-43	Dissolved	0.0024	mg/l	J/J	Yes	Yes		6300	ug/L	No
	PZ-105	Total	0.013	mg/l		No	Yes	06/01/2017	6300	ug/L	No
	PZ-120	Dissolved	0.066	mg/l		No	Yes	06/01/2017	6300	ug/L	No
	PZ-120	Total	0.35	mg/l		No	Yes	06/01/2017	6300	ug/L	No
	RD-17	Dissolved	1.4	mg/l		No	Yes	02/10/2014	6300	ug/L	No
	RD-17	Total	1.8	mg/l		No	Yes	02/10/2014	6300	ug/L	No
	RD-34B	Total	0.13	mg/l		No	Yes	06/01/2015	6300	ug/L	No
	RD-54A	Total	0.53	mg/l		No	Yes	06/01/2017	6300	ug/L	No

TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

				Well Identifier	C-8	DD-139	DD-139	DD-140	DD-140
				Sample Name	C-8_021918_01_L	DD-139_022218_01_L	DD-139_022218_36_L	DD-140_022718_01_L	DD-140_022718_36_L
				Sample Date	2/19/2018	2/22/2018	2/22/2018	2/27/2018	2/27/2018
				Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
				Sample Type	N	N	FD	N	FD
Analyte	**Fraction**	**Method**	**Units**						
1,1,1-Trichloroethane	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	12 U	3 U	3 U	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L	4 UJ	1 U	1 U	1 U	1 U
1,4-Dioxane	N	SW8260B	ug/L	----	----	----	0.9 J	----
2-Butanone (MEK)	N	SW8260B	ug/L	24 U	6 U	4.7 J	6 U	6 U
Acetone	N	SW8260B	ug/L	40 U	7 U	9.1 U	10 U	10 U
Benzene	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	4 U	1 U	1 U	1 UJ	1 UJ
Chloroform	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	4.8	1 U	1 U	1 U	1 U
Ethylbenzene	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L	8 U	2 U	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
Trichloroethene	N	SW8260B	ug/L	82	1 U	1 U	0.91 J	0.88 J
Trichlorofluoromethane	N	SW8260B	ug/L	8 UJ	2 U	2 U	2 U	2 U
Vinyl chloride	N	SW8260B	ug/L	4 U	1 U	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L	8 U	2 U	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit.

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	DD-141	DD-142	DD-143	DD-144	DD-145
			Sample Name	DD-141_022718_01_L	DD-142_022218_01_L	DD-143_022618_01_L	DD-144_022218_01_L	DD-145_021918_01_L
			Sample Date	2/27/2018	2/22/2018	2/26/2018	2/22/2018	2/19/2018
			Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
			Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
1,1,1-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	3 U	3 U	3 U	7.8 J	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 UJ
1,4-Dioxane	N	SW8260B	ug/L	1 U	----	----	----	----
2-Butanone (MEK)	N	SW8260B	ug/L	6 U	6 U	6 U	24 U	6 U
Acetone	N	SW8260B	ug/L	10 U	3.6 U	10 U	40 U	10 U
Benzene	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	1 UJ	1 U	1 U	4 U	1 U
Chloroform	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	16	1 U
Ethylbenzene	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
Methylene Chloride	N	SW8260B	ug/L	2 U	2 U	2 U	8 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	1 U	3.6	1 U	4 U	1 U
Toluene	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
Trichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	200	0.33 J
Trichlorofluoromethane	N	SW8260B	ug/L	2 U	2 U	2 U	8 U	2 UJ
Vinyl chloride	N	SW8260B	ug/L	1 U	1 U	1 U	4 U	1 U
Xylenes, Total	N	SW8260B	ug/L	2 U	2 U	2 U	8 U	2 U

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit.

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		DS-43	DS-44	DS-46	DS-47	PZ-105
		Sample Name		DS-43_022218_01_L	DS-44_022318_01_L	DS-46_022718_01_L	DS-47_022318_01_L	PZ-105_021918_01_L
		Sample Date		2/22/2018	2/23/2018	2/27/2018	2/23/2018	2/19/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
1,1,1-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	3 U	3 U	3 U	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 UJ
1,4-Dioxane	N	SW8260B	ug/L	----	----	1.5	----	----
2-Butanone (MEK)	N	SW8260B	ug/L	6 U	6 U	6 U	6 U	6 U
Acetone	N	SW8260B	ug/L	10 U	10 U	10 U	10 U	10 U
Benzene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	1 U	1 U	1 UJ	1 U	1 U
Chloroform	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	0.25 J	1 U	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Trichloroethene	N	SW8260B	ug/L	1 U	1 U	0.43 J	1 U	11
Trichlorofluoromethane	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 UJ
Vinyl chloride	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

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J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		PZ-108	PZ-109	PZ-120	RD-07	RD-14
		Sample Name		PZ-108_021918_01_L	PZ-109_022218_01_L	PZ-120_022618_01_L	RD-07_022618_01_L	RD-14_030218_01_L
		Sample Date		2/19/2018	2/22/2018	2/26/2018	2/26/2018	3/2/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
1,1,1-Trichloroethane	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	30 U	12 U	0.5 J	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L	10 UJ	4 U	1 U	1 U	1 U
1,4-Dioxane	N	SW8260B	ug/L	----	----	----	----	----
2-Butanone (MEK)	N	SW8260B	ug/L	60 U	24 U	6 U	6 U	6 U
Acetone	N	SW8260B	ug/L	100 U	17 U	10 U	10 U	5.4 U
Benzene	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
Chloroform	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	12	1.9 J	1 U	2.2	1 U
Ethylbenzene	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L	20 U	8 U	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	10 U	72	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
Trichloroethene	N	SW8260B	ug/L	160	6.1	5.6	32	0.22 J
Trichlorofluoromethane	N	SW8260B	ug/L	20 UJ	8 U	2 U	2 U	2 U
Vinyl chloride	N	SW8260B	ug/L	10 U	4 U	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L	20 U	8 U	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

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J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

				Well Identifier	RD-17	RD-19	RD-20	RD-21	RD-23
				Sample Name	RD-17_030218_01_L	RD-19_022818_01_L	RD-20_022018_01_L	RD-21_022018_01_L	RD-23_021918_01_L
				Sample Date	3/2/2018	2/28/2018	2/20/2018	2/20/2018	2/19/2018
				Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
				Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**						
1,1,1-Trichloroethane	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L		3 U	3 U	3 U	3 U	120 U
1,1,2-Trichloroethane	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
1,1-Dichloroethane	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
1,1-Dichloroethene	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	30 J
1,2-Dichloroethane	N	SW8260B	ug/L		1 U	1 U	1 UJ	1 UJ	40 U
1,4-Dioxane	N	SW8260B	ug/L		----	----	----	----	----
2-Butanone (MEK)	N	SW8260B	ug/L		6 U	6 U	6 U	6 U	240 U
Acetone	N	SW8260B	ug/L		11 U	5 J	10 U	10 U	400 U
Benzene	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
Carbon Tetrachloride	N	SW8260B	ug/L		1 U	1 U	1 U	11	40 U
Chloroform	N	SW8260B	ug/L		1 U	1 U	1 U	3.7	40 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L		1 U	1 U	1 U	1.7	28 J
Ethylbenzene	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
Methylene Chloride	N	SW8260B	ug/L		2 U	2 U	2 U	2 U	80 U
Tetrachloroethene	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
Toluene	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
Trichloroethene	N	SW8260B	ug/L		0.27 J	1 U	1 U	45 J	1100
Trichlorofluoromethane	N	SW8260B	ug/L		2 U	2 U	2 UJ	2 UJ	80 U
Vinyl chloride	N	SW8260B	ug/L		1 U	1 U	1 U	1 U	40 U
Xylenes, Total	N	SW8260B	ug/L		2 U	2 U	2 U	2 U	80 U

NOTES AND ABBREVIATIONS

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TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		RD-29	RD-33A	RD-33B	RD-33C	RD-34A
		Sample Name		RD-29_022718_01_L	RD-33A_030118_01_L	RD-33B_022018_01_L	RD-33C_022118_01_L	RD-34A_030218_01_L
		Sample Date		2/27/2018	3/1/2018	2/20/2018	2/21/2018	3/2/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
1,1,1-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	3 U	3 U	3 U	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	1 U	0.41 J	1 U	1 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L	1 U	0.54 J	1 U	1 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,4-Dioxane	N	SW8260B	ug/L	----	----	----	----	1 UJ
2-Butanone (MEK)	N	SW8260B	ug/L	6 U	6 U	6 UJ	6 UJ	6 U
Acetone	N	SW8260B	ug/L	10 U	5 U	10 UJ	10 UJ	9.1 U
Benzene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	1 UJ	1 U	1 U	1 U	1 U
Chloroform	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	2.1	1 U	1 U	0.44 J
Ethylbenzene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	3.2	1 U	1 U	1 U
Trichloroethene	N	SW8260B	ug/L	1.1	1	1 U	1 U	0.78 J
Trichlorofluoromethane	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

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TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

				Well Identifier	RD-34A	RD-34B	RD-34C	RD-54A	RD-59A
				Sample Name	RD-34A_030218_36_L	RD-34B_030118_01_L	RD-34C_030218_01_L	RD-54A_030118_01_L	RD-59A_022818_01_L
				Sample Date	3/2/2018	3/1/2018	3/2/2018	3/1/2018	2/28/2018
				Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
				Sample Type	FD	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**						
1,1,1-Trichloroethane	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L		----	3 U	3 U	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
1,4-Dioxane	N	SW8260B	ug/L		0.22 J	0.48 J	1 UJ	----	----
2-Butanone (MEK)	N	SW8260B	ug/L		----	6 U	6 U	6 U	6 U
Acetone	N	SW8260B	ug/L		----	9.1 U	6.8 U	2 U	8.2 J
Benzene	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
Chloroform	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L		----	1 U	1 U	1.8	1 U
Ethylbenzene	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L		----	2 U	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
Trichloroethene	N	SW8260B	ug/L		----	1 U	1 U	2.3	1 U
Trichlorofluoromethane	N	SW8260B	ug/L		----	2 U	2 U	2 U	2 U
Vinyl chloride	N	SW8260B	ug/L		----	1 U	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L		----	2 U	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

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TABLE 10
VOLATILE ORGANIC COMPOUNDS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

				Well Identifier	RD-59B	RD-59C	RD-59C	RD-63	RD-63
				Sample Name	RD-59B_022818_01_L	RD-59C_022818_01_L	RD-59C_022818_36_L	RD-63_022118_01_L	RD-63_022118_36_L
				Sample Date	2/28/2018	2/28/2018	2/28/2018	2/21/2018	2/21/2018
				Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
				Sample Type	N	N	FD	N	FD
Analyte	**Fraction**	**Method**	**Units**						
1,1,1-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	3 U	3 U	3 U	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	0.61 J	0.6 J
1,1-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	0.77 J	0.77 J
1,2-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
1,4-Dioxane	N	SW8260B	ug/L	----	----	----	----	----
2-Butanone (MEK)	N	SW8260B	ug/L	6 U	6 U	6 U	6 UJ	6 UJ
Acetone	N	SW8260B	ug/L	10 U	3.7 J	4.5 J	10 UJ	10 UJ
Benzene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Chloroform	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	4.3	4.1
Ethylbenzene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Trichloroethene	N	SW8260B	ug/L	1 U	1 U	1 U	6	6 U
Trichlorofluoromethane	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	N	SW8260B	ug/L	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L	2 U	2 U	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

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			Well Identifier	RD-65	RD-96	RD-98
			Sample Name	RD-65_022718_01_L	RD-96_022118_01_L	RD-98_022818_01_L
			Sample Date	2/27/2018	2/21/2018	2/28/2018
			Lab Name	TA DEN	TA DEN	TA DEN
			Sample Type	N	N	N
Analyte	**Fraction**	**Method**	**Units**			
1,1,1-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	N	SW8260B	ug/L	3 U	3 U	3 U
1,1,2-Trichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U
1,1-Dichloroethane	N	SW8260B	ug/L	2.3	1 U	1 U
1,1-Dichloroethene	N	SW8260B	ug/L	7.7	1 U	1 U
1,2-Dichloroethane	N	SW8260B	ug/L	1 U	1 U	1 U
1,4-Dioxane	N	SW8260B	ug/L	0.5 J	----	----
2-Butanone (MEK)	N	SW8260B	ug/L	6 U	6 UJ	6 U
Acetone	N	SW8260B	ug/L	10 U	10 UJ	8.7 J
Benzene	N	SW8260B	ug/L	1 U	1 U	1 U
Carbon Tetrachloride	N	SW8260B	ug/L	1 U	1 U	1 U
Chloroform	N	SW8260B	ug/L	1 U	1 U	1 U
cis-1,2-Dichloroethene	N	SW8260B	ug/L	9.7	1 U	1 U
Ethylbenzene	N	SW8260B	ug/L	1 U	1 U	1 U
Methylene Chloride	N	SW8260B	ug/L	2 U	2 U	2 U
Tetrachloroethene	N	SW8260B	ug/L	1 U	1 U	1 U
Toluene	N	SW8260B	ug/L	1 U	1 U	1 U
trans-1,2-Dichloroethene	N	SW8260B	ug/L	24	1 U	1 U
Trichloroethene	N	SW8260B	ug/L	10	1 U	1.4
Trichlorofluoromethane	N	SW8260B	ug/L	2 U	2 U	2 U
Vinyl chloride	N	SW8260B	ug/L	1 U	1 U	1 U
Xylenes, Total	N	SW8260B	ug/L	2 U	2 U	2 U

NOTES AND ABBREVIATIONS

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TABLE 11
PERCHLORATE ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier	DD-139	DD-141	RD-21	RD-33A	RD-33B
		Sample Name	DD-139_022218_01_L	DD-141_022718_01_L	RD-21_022018_01_L	RD-33A_030118_01_L	RD-33B_022018_01_L
		Sample Date	2/22/2018	2/27/2018	2/20/2018	3/1/2018	2/20/2018
		Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**				
Perchlorate	N	SW6860	ug/L	0.057	0.05 U	2.3 J-	0.05 U	0.017 J

NOTES AND ABBREVIATIONS

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J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J- - The result is an estimated quantity, but the result may be biased low.

TABLE 11
PERCHLORATE ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-33B	RD-33C	RD-54A	RD-59A	RD-59B
			Sample Name	RD-33B_022018_36_L	RD-33C_022118_01_L	RD-54A_030118_01_L	RD-59A_022818_01_L	RD-59B_022818_01_L
			Sample Date	2/20/2018	2/21/2018	3/1/2018	2/28/2018	2/28/2018
			Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
			Sample Type	FD	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Perchlorate	N	SW6860	ug/L	0.011 J	0.05 U	0.05 U	0.05 U	0.05 U

NOTES AND ABBREVIATIONS

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J- - The result is an estimated quantity, but the result may be biased low.

TABLE 11
PERCHLORATE ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-59C	RD-96
			Sample Name	RD-59C_022818_01_L	RD-96_022118_01_L
			Sample Date	2/28/2018	2/21/2018
			Lab Name	TA DEN	TA DEN
			Sample Type	N	N
Analyte	**Fraction**	**Method**	**Units**		
Perchlorate	N	SW6860	ug/L	0.05 U	0.05 U

NOTES AND ABBREVIATIONS

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U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J- - The result is an estimated quantity, but the result may be biased low.

TABLE 12
FUEL HYDROCARBONS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	DD-141	DD-145	DD-145	PZ-105	RD-14
			Sample Name	DD-141_022718_01_L	DD-145_021918_01_L	DD-145_021918_36_L	PZ-105_021918_01_L	RD-14_030218_01_L
			Sample Date	2/27/2018	2/19/2018	2/19/2018	2/19/2018	3/2/2018
			Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
			Sample Type	N	N	FD	N	N
Analyte	**Fraction**	**Method**	**Units**					
Diesel Range Organics (DRO) [C10-C28]	N	SW8015DRO	ug/L	62 U	56 J	----	520	43 J
Gasoline Range Organics (GRO) [C6-C10]	N	SW8015GRO	ug/L	55 J	25 U	25 U	11 J	25 U

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 12
FUEL HYDROCARBONS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-19	RD-34A	RD-54A	RD-63	RD-63
			Sample Name	RD-19_022818_01_L	RD-34A_030218_01_L	RD-54A_030118_01_L	RD-63_022118_01_L	RD-63_022118_36_L
			Sample Date	2/28/2018	3/2/2018	3/1/2018	2/21/2018	2/21/2018
			Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
			Sample Type	N	N	N	N	FD
Analyte	**Fraction**	**Method**	**Units**					
Diesel Range Organics (DRO) [C10-C28]	N	SW8015DRO	ug/L	58 U	55 J	58 J	46 J	----
Gasoline Range Organics (GRO) [C6-C10]	N	SW8015GRO	ug/L	29 U	25 U	57 J	17 U	17 U

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 12
FUEL HYDROCARBONS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-96	RD-96
			Sample Name	RD-96_022118_01_L	RD-96_022118_36_L
			Sample Date	2/21/2018	2/21/2018
			Lab Name	TA DEN	TA DEN
			Sample Type	N	FD
Analyte	**Fraction**	**Method**	**Units**		
Diesel Range Organics (DRO) [C10-C28]	N	SW8015DRO	ug/L	51 J	44 J
Gasoline Range Organics (GRO) [C6-C10]	N	SW8015GRO	ug/L	10 U	----

NOTES AND ABBREVIATIONS

ug/L - micrograms per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 13
INORGANIC ANALYTES ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	DD-145	PZ-105	RD-14	RD-19	RD-20
			Sample Name	DD-145_021918_01_L	PZ-105_021918_01_L	RD-14_030218_01_L	RD-19_022818_01_L	RD-20_022018_01_L
			Sample Date	2/19/2018	2/19/2018	3/2/2018	2/28/2018	2/20/2018
			Lab Name	TA STL	TA STL	TA DEN	TA DEN	TA DEN
			Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Fluoride	T	E300.0	mg/L	----	----	0.27 J	0.41 J	----
Nitrate as N	T	E300.0	mg/L	4.2	4.4	----	----	9.4

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

TA STL - Test America St. Louis, Missouri

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 13
INORGANIC ANALYTES ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-20	RD-34A	RD-34B	RD-34C	RD-59A
			Sample Name	RD-20_022018_36_L	RD-34A_030218_01_L	RD-34B_030118_01_L	RD-34C_030218_01_L	RD-59A_022818_01_L
			Sample Date	2/20/2018	3/2/2018	3/1/2018	3/2/2018	2/28/2018
			Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
			Sample Type	FD	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Fluoride	T	E300.0	mg/L	----	0.45 J	0.69	0.33 J	0.89
Nitrate as N	T	E300.0	mg/L	9.4	----	----	----	----

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

TA STL - Test America St. Louis, Missouri

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 13
INORGANIC ANALYTES ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-59B	RD-59B	RD-59C
			Sample Name	RD-59B_022818_01_L	RD-59B_022818_36_L	RD-59C_022818_01_L
			Sample Date	2/28/2018	2/28/2018	2/28/2018
			Lab Name	TA DEN	TA DEN	TA DEN
			Sample Type	N	FD	N
Analyte	**Fraction**	**Method**	**Units**			
Fluoride	T	E300.0	mg/L	0.8	0.8	0.71
Nitrate as N	T	E300.0	mg/L	----	----	----

NOTES AND ABBREVIATIONS
mg/L - milligrams per liter
---- - Not analyzed
N - Normal Sample
FD - Field Duplicate Sample
TA DEN - Test America Denver, Colorado
TA STL - Test America St. Louis, Missouri
J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	DD-141	DD-143	DD-144	DS-44	DS-47
			Sample Name	DD-141_022718_01_L	DD-143_022618_01_L	DD-144_022218_01_L	DS-44_022318_01_L	DS-47_022318_01_L
			Sample Date	2/27/2018	2/26/2018	2/22/2018	2/23/2018	2/23/2018
			Lab Name	TA STL	TA STL	TA STL	TA STL	TA STL
			Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Actinium-228	T	E901.1	pCi/L	9.02 U	14.9 U	----	22.8 U	-31.3 U
Actinium-228	D	E901.1	pCi/L	1.59 U	0.0191 U	----	16.4 U	18.3 U
Americium-241	T	E901.1	pCi/L	-8.13 U	-7.16 U	----	-0.887 U	2.10 U
Americium-241	D	E901.1	pCi/L	-3.09 U	5.48 U	----	-10.0 U	-11.7 U
Antimony-125	T	E901.1	pCi/L	4.24 U	7.47 U	----	2.79 U	13.5 U
Antimony-125	D	E901.1	pCi/L	13.9 U	-2.48 U	----	13.2 U	-1.70 U
Barium-133	T	E901.1	pCi/L	-1.81 U	9.23 U	----	0.287 U	-5.63 U
Barium-133	D	E901.1	pCi/L	-3.29 U	-0.741 U	----	12.1 U	6.64 U
Cesium-134	T	E901.1	pCi/L	0.136 U	7.2 U	----	7.62 U	9.57 U
Cesium-134	D	E901.1	pCi/L	8.05 U	-1.77 U	----	9.48 U	0.672 U
Cesium-137	T	E901.1	pCi/L	-3.73 U	-7.48 U	----	-9.72 U	3.28 U
Cesium-137	D	E901.1	pCi/L	-4.52 U	-2.49 U	----	-3.22 U	3.90 U
Cobalt-57	T	E901.1	pCi/L	-0.0564 U	1.07 U	----	-0.498 U	-0.560 U
Cobalt-57	D	E901.1	pCi/L	-1.04 U	4.37 U	----	-3.69 U	5.52
Cobalt-60	T	E901.1	pCi/L	-5.84 U	-10.7 U	----	-0.440 U	-5.45 U
Cobalt-60	D	E901.1	pCi/L	0.398 U	-0.497 U	----	2.36 U	-0.658 U
Europium-152	T	E901.1	pCi/L	8.58 U	2.86 U	----	1.07 U	-13.6 U
Europium-152	D	E901.1	pCi/L	12.9 U	17.5 U	----	14.3 U	7.65 U
Europium-154	T	E901.1	pCi/L	11.7 U	-52.1 U	----	-32.0 U	31.3 U
Europium-154	D	E901.1	pCi/L	-0.0963 U	10.7 U	----	35.8 U	-10.7 U
Europium-155	T	E901.1	pCi/L	-4.79 U	-0.477 U	----	-4.52 U	-14.5 U
Europium-155	D	E901.1	pCi/L	-7.36 U	-0.566 U	----	-10.6 U	-14.1 U
Gross Alpha	T	E900	pCi/L	19	7.04	----	7.83	6.37
Gross Alpha	D	E900	pCi/L	4.91	2.55 U	----	5.22	4.96
Gross Beta	T	E900	pCi/L	18.9	8.93	----	11.9	7.60
Gross Beta	D	E900	pCi/L	5.25	7.7	----	3.93	4.87
Manganese-54	T	E901.1	pCi/L	2.54 U	-1.35 U	----	6.24 U	4.41 U
Manganese-54	D	E901.1	pCi/L	0.13 U	3.52 U	----	-9.86 U	-7.64 U
Potassium-40	T	E901.1	pCi/L	0.986 U	50.3 U	----	-101 U	-67.7 U
Potassium-40	D	E901.1	pCi/L	-40.5 U	-69.3 U	----	23.0 U	-54.4 U
Radium-226	T	E903	pCi/L	2.5	1.67	----	0.906	0.383
Radium-226	D	E903	pCi/L	1.39	1.46	----	0.311 UJ	0.464 J
Radium-228	T	E904	pCi/L	4.22	3.33	----	2.14 J	0.853 UJ
Radium-228	D	E904	pCi/L	2.06	3.64	----	0.831 UJ	1.20 UJ
Sodium-22	T	E901.1	pCi/L	2.34 U	3.75 U	----	-7.75 U	-3.14 U
Sodium-22	D	E901.1	pCi/L	-3.73 U	4.45 U	----	-0.372 U	1.05 U
Strontium-90	T	E905	pCi/L	0.0718 U	0.0613 U	----	0.123 U	0.206 U

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	DD-141	DD-143	DD-144	DS-44	DS-47
			Sample Name	DD-141_022718_01_L	DD-143_022618_01_L	DD-144_022218_01_L	DS-44_022318_01_L	DS-47_022318_01_L
			Sample Date	2/27/2018	2/26/2018	2/22/2018	2/23/2018	2/23/2018
			Lab Name	TA STL	TA STL	TA STL	TA STL	TA STL
			Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Strontium-90	D	E905	pCi/L	0.183 U	0.179 U	----	0.0966 U	0.0466 U
Tritium	T	E906.0	pCi/L	----	----	-29.3 U	----	----
Uranium-233/234	T	A-01-R	pCi/L	2.22	2.57	----	3.25	2.49
Uranium-233/234	D	A-01-R	pCi/L	1.77	2.7	----	2.99	1.67
Uranium-235/236	T	A-01-R	pCi/L	0.271	0.0572 U	----	0.180 U	0.0417 U
Uranium-235/236	D	A-01-R	pCi/L	0.0257 U	0.0849	----	0.174	0.0625 U
Uranium-238	T	A-01-R	pCi/L	1.33	1.9	----	2.51	1.79
Uranium-238	D	A-01-R	pCi/L	1.34	1.47	----	2.72	1.50

NOTES AND ABBREVIATIONS

pCi/L - picocuries per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA STL - Test America St. Louis, Missouri

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

		Well Identifier		DS-47	PZ-120	RD-07	RD-14	RD-19
		Sample Name		DS-47_022318_36_L	PZ-120_022618_01_L	RD-07_022618_01_L	RD-14_030218_01_L	RD-19_022818_01_L
		Sample Date		2/23/2018	2/26/2018	2/26/2018	3/2/2018	2/28/2018
		Lab Name		TA STL	TA STL	TA STL	TA STL	TA STL
		Sample Type		FD	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Actinium-228	T	E901.1	pCi/L	25.4 U	30.7 U	-25.6 U	24 U	20.4 U
Actinium-228	D	E901.1	pCi/L	16.8 U	----	19 U	1.5 U	22.2 U
Americium-241	T	E901.1	pCi/L	7.50 U	-7.87 U	2.41 U	5.92 U	9.67 U
Americium-241	D	E901.1	pCi/L	3.39 U	----	-6.08 U	10.5 U	6.82 U
Antimony-125	T	E901.1	pCi/L	-3.13 U	4.97 U	15.5 U	2.45 U	10.5 U
Antimony-125	D	E901.1	pCi/L	2.58 U	----	-4.71 U	1.62 U	-2.49 U
Barium-133	T	E901.1	pCi/L	6.93 U	12.2 U	-1.37 U	-3.18 U	-3.14 U
Barium-133	D	E901.1	pCi/L	5.98 U	----	-1.06 U	-2.56 U	-1.41 U
Cesium-134	T	E901.1	pCi/L	1.85 U	0.0978 U	0.386 U	2.58 U	-2.25 U
Cesium-134	D	E901.1	pCi/L	3.50 U	----	1.56 U	13.1 U	-3 U
Cesium-137	T	E901.1	pCi/L	-0.336 U	-2.43 U	-1.19 U	-0.325 U	0.248 U
Cesium-137	D	E901.1	pCi/L	-7.13 U	----	1.46 U	3.96 U	-2.06 U
Cobalt-57	T	E901.1	pCi/L	2.74 U	-1.37 U	0.796 U	-1.07 U	3.29 U
Cobalt-57	D	E901.1	pCi/L	0.226 U	----	-3.11 U	-1.88 U	7.38
Cobalt-60	T	E901.1	pCi/L	-1.58 U	7.26	5.16 U	-1.22 U	2.15 U
Cobalt-60	D	E901.1	pCi/L	3.41 U	----	1.11 U	6.09 U	4.75 U
Europium-152	T	E901.1	pCi/L	5.10 U	6.73 U	-7.65 U	-12.6 U	6.13 U
Europium-152	D	E901.1	pCi/L	10.3 U	----	0.636 U	-20.2 U	10.2 U
Europium-154	T	E901.1	pCi/L	-46.1 U	-42.5 U	10.7 U	12.7 U	15.4 U
Europium-154	D	E901.1	pCi/L	44.5	----	13 U	-56.2 U	3.11 U
Europium-155	T	E901.1	pCi/L	-6.84 U	-2.2 U	-6.6 U	-13.2 U	-15.2 U
Europium-155	D	E901.1	pCi/L	-5.65 U	----	3.62 U	13.3 U	-3.95 U
Gross Alpha	T	E900	pCi/L	3.21	2.89 U	4.06 U	2.86 U	30.3
Gross Alpha	D	E900	pCi/L	3.16	7.47	5.46	2.5	21.7
Gross Beta	T	E900	pCi/L	6.53	5.48	7.29	5.08	12.8
Gross Beta	D	E900	pCi/L	3.83	1.62 U	2.78	4.44	17.3
Manganese-54	T	E901.1	pCi/L	-0.507 U	-2.48 U	3.6 U	-2.68 U	6.03 U
Manganese-54	D	E901.1	pCi/L	-3.55 U	----	-0.00493 U	4.27 U	-9.83 U
Potassium-40	T	E901.1	pCi/L	2.96 U	28.1 U	-69.3 U	15.8 U	-75.4 U
Potassium-40	D	E901.1	pCi/L	-61.4 U	----	42.9 U	3.3 U	-91.9 U
Radium-226	T	E903	pCi/L	0.408	0.14	0.33	0.584	1.17
Radium-226	D	E903	pCi/L	0.324 UJ	----	0.365	0.486	1.37
Radium-228	T	E904	pCi/L	0.895 UJ	0.79 UJ	0.869 J	1.31	3.19
Radium-228	D	E904	pCi/L	1.28 UJ	----	0.576	1.25	3.02
Sodium-22	T	E901.1	pCi/L	0.000 U	4.5 U	5.45 U	-2.81 U	-2.97 U
Sodium-22	D	E901.1	pCi/L	-4.22 U	----	6.33	-11.5 U	0.373 U
Strontium-90	T	E905	pCi/L	0.0406 U	0.0329 U	-0.0254 U	-0.0647 U	0.131 U

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	DS-47	PZ-120	RD-07	RD-14	RD-19
			Sample Name	DS-47_022318_36_L	PZ-120_022618_01_L	RD-07_022618_01_L	RD-14_030218_01_L	RD-19_022818_01_L
			Sample Date	2/23/2018	2/26/2018	2/26/2018	3/2/2018	2/28/2018
			Lab Name	TA STL	TA STL	TA STL	TA STL	TA STL
			Sample Type	FD	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Strontium-90	D	E905	pCi/L	0.0183 U	----	-0.0211 U	0.137 U	0.997 U
Tritium	T	E906.0	pCi/L	----	----	----	----	----
Uranium-233/234	T	A-01-R	pCi/L	1.84	2.82	3.1	1.91	16.7
Uranium-233/234	D	A-01-R	pCi/L	1.79	----	2.79	2.12	15.9
Uranium-235/236	T	A-01-R	pCi/L	0.195	0.141 U	0.301	0.0319 U	0.761
Uranium-235/236	D	A-01-R	pCi/L	0.0954 U	----	0.219	0.0493 U	0.592
Uranium-238	T	A-01-R	pCi/L	1.58	2.38	2.96	1.41	14.9
Uranium-238	D	A-01-R	pCi/L	1.48	----	2.36	1.83	14.6

NOTES AND ABBREVIATIONS

pCi/L - picocuries per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA STL - Test America St. Louis, Missouri

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		RD-20	RD-33A	RD-33B	RD-33C	RD-34A
		Sample Name		RD-20_022018_01_L	RD-33A_030118_01_L	RD-33B_022018_01_L	RD-33C_022118_01_L	RD-34A_030218_01_L
		Sample Date		2/20/2018	3/1/2018	2/20/2018	2/21/2018	3/2/2018
		Lab Name		TA STL	TA STL	TA STL	TA STL	TA STL
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Actinium-228	T	E901.1	pCi/L	36.6	-20.2 U	17.6 U	16.1 U	29.4 U
Actinium-228	D	E901.1	pCi/L	18.8 U	30.5 U	12.6 U	9.28 U	6.96 U
Americium-241	T	E901.1	pCi/L	10.7 U	-6.82 U	1.15 U	-8.43 U	1.67 U
Americium-241	D	E901.1	pCi/L	1.72 U	-9.31 U	-0.763 U	-7.46 U	2.31 U
Antimony-125	T	E901.1	pCi/L	18.5 U	17.7 U	-15.2 U	14.5 U	17.8 U
Antimony-125	D	E901.1	pCi/L	3.28 U	-13.6 U	0.543 U	14.6 U	8 U
Barium-133	T	E901.1	pCi/L	1.95 U	0.675 U	-4.77 U	2.53 U	1.94 U
Barium-133	D	E901.1	pCi/L	-1.22 U	14.1 U	7.76 U	-4.89 U	-7.27 U
Cesium-134	T	E901.1	pCi/L	-3.07 U	6.51 U	-0.894 U	8.11 U	-2.53 U
Cesium-134	D	E901.1	pCi/L	-1.76 U	10.5 U	3.95 U	8.97 U	0.802 U
Cesium-137	T	E901.1	pCi/L	-3.78 U	-6.73 U	-0.775 U	2.79 U	-0.0384 U
Cesium-137	D	E901.1	pCi/L	1.39 U	5.37 U	-2.22 U	1.79 U	-9.09 U
Cobalt-57	T	E901.1	pCi/L	2.78 U	3.95 U	-1.44 U	-0.370 U	-1.14 U
Cobalt-57	D	E901.1	pCi/L	2.92 U	-4.15 U	-0.398 U	-1.05 U	2.61 U
Cobalt-60	T	E901.1	pCi/L	-7.95 U	0.36 U	3.49 U	1.81 U	4.79 U
Cobalt-60	D	E901.1	pCi/L	3.44 U	2.22 U	1.09 U	-6.72 U	3.64 U
Europium-152	T	E901.1	pCi/L	8.22 U	4.03 U	11.4 U	11.3 U	-17.8 U
Europium-152	D	E901.1	pCi/L	14.3 U	1.66 U	6.80 U	3.76 U	12.6 U
Europium-154	T	E901.1	pCi/L	0.000 U	-15.4 U	12.8 U	6.87 U	13.6 U
Europium-154	D	E901.1	pCi/L	5.30 U	31.7 U	-48.5 U	37.9 U	-4.8 U
Europium-155	T	E901.1	pCi/L	-11.3 U	-9.47 U	-5.65 U	0.707 U	6.98 U
Europium-155	D	E901.1	pCi/L	-15.5 U	10.9 U	9.57 U	3.53 U	-2.26 U
Gross Alpha	T	E900	pCi/L	10.3	3 U	0.667 U	7.10	11.3
Gross Alpha	D	E900	pCi/L	9.99	5.79	2.96	2.89	8.27
Gross Beta	T	E900	pCi/L	2.31 U	3.68	2.60	2.59	7.8
Gross Beta	D	E900	pCi/L	5.18	4.67	2.67	5.52	7.3
Manganese-54	T	E901.1	pCi/L	-7.80 U	-9.83 U	-4.08 U	4.49 U	-3.6 U
Manganese-54	D	E901.1	pCi/L	-1.07 U	4.27 U	-3.57 U	2.44 U	-4.47 U
Potassium-40	T	E901.1	pCi/L	-27.6 U	-84 U	37.0 U	-27.6 U	18.5 U
Potassium-40	D	E901.1	pCi/L	-83.9 U	15.1 U	-67.9 U	-104 U	71.5 U
Radium-226	T	E903	pCi/L	0.677	0.948	0.512	1.25	0.677
Radium-226	D	E903	pCi/L	0.605	0.772	0.661	1.26	0.427
Radium-228	T	E904	pCi/L	2.94	1.39	2.92	4.55	0.882
Radium-228	D	E904	pCi/L	1.15	1.04	0.574	1.63	1.06
Sodium-22	T	E901.1	pCi/L	0.295 U	0.746 U	4.45 U	-2.36 U	2.1 U
Sodium-22	D	E901.1	pCi/L	1.05 U	-0.372 U	4.45 U	3.25 U	-9.01 U
Strontium-90	T	E905	pCi/L	0.310 U	-0.0213 U	0.141 U	0.128 U	0.197 U

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-20	RD-33A	RD-33B	RD-33C	RD-34A
			Sample Name	RD-20_022018_01_L	RD-33A_030118_01_L	RD-33B_022018_01_L	RD-33C_022118_01_L	RD-34A_030218_01_L
			Sample Date	2/20/2018	3/1/2018	2/20/2018	2/21/2018	3/2/2018
			Lab Name	TA STL	TA STL	TA STL	TA STL	TA STL
			Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Strontium-90	D	E905	pCi/L	0.132 U	0.141 U	0.241	0.187 U	0.0532 U
Tritium	T	E906.0	pCi/L	----	----	----	----	----
Uranium-233/234	T	A-01-R	pCi/L	4.54	2.35	0.0210 U	0.157	5.3
Uranium-233/234	D	A-01-R	pCi/L	5.22	2.24	0.0335 U	0.264	5.36
Uranium-235/236	T	A-01-R	pCi/L	0.137	0.125	0.000 U	-0.00983 U	0.416
Uranium-235/236	D	A-01-R	pCi/L	0.185	0.0313 U	0.0236 U	0.0885 U	0.255
Uranium-238	T	A-01-R	pCi/L	3.24	1.54	0.0131 U	0.0775 U	5.74
Uranium-238	D	A-01-R	pCi/L	3.57	1.63	-0.00436 U	0.0981 U	5.55

NOTES AND ABBREVIATIONS

pCi/L - picocuries per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA STL - Test America St. Louis, Missouri

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

		Well Identifier		RD-34B	RD-34C	RD-54A	RD-59A	RD-59B
		Sample Name		RD-34B_030118_01_L	RD-34C_030218_01_L	RD-54A_030118_01_L	RD-59A_022818_01_L	RD-59B_022818_01_L
		Sample Date		3/1/2018	3/2/2018	3/1/2018	2/28/2018	2/28/2018
		Lab Name		TA STL	TA STL	TA STL	TA STL	TA STL
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Actinium-228	T	E901.1	pCi/L	59.9 U	3.47 U	-15.2 U	-8.25 U	6.39 U
Actinium-228	D	E901.1	pCi/L	45.2 U	36.6 U	7.17 U	-58.7 U	-11.7 U
Americium-241	T	E901.1	pCi/L	-12.3 U	6.67 U	6.82 U	8.37 U	6.51 U
Americium-241	D	E901.1	pCi/L	5.56 U	6.63 U	6.25 U	-2.43 U	-11.5 U
Antimony-125	T	E901.1	pCi/L	11.5 U	7.94 U	0.99 U	21.6 U	12.9 U
Antimony-125	D	E901.1	pCi/L	-5.05 U	14.9 U	10.9 U	18.8 U	5.86 U
Barium-133	T	E901.1	pCi/L	0 U	4.87 U	-4.87 U	-2.38 U	2.11 U
Barium-133	D	E901.1	pCi/L	1.02 U	-2.61 U	2.47 U	-1.07 U	-1.81 U
Cesium-134	T	E901.1	pCi/L	2.51 U	3.45 U	1.06 U	-2.95 U	-1.39 U
Cesium-134	D	E901.1	pCi/L	10.9 U	7.75 U	-1.07 U	-0.931 U	6.03 U
Cesium-137	T	E901.1	pCi/L	6.58 U	0 U	1.39 U	-0.487 U	-0.325 U
Cesium-137	D	E901.1	pCi/L	3.59 U	-7.47 U	0.649 U	-6.57 U	-5.84 U
Cobalt-57	T	E901.1	pCi/L	2.41 U	-0.819 U	0.204 U	-0.0807 U	1.73 U
Cobalt-57	D	E901.1	pCi/L	6.6 U	5.76 U	2.14 U	3.34 U	-2.6 U
Cobalt-60	T	E901.1	pCi/L	4.15 U	-6.57 U	1.25 U	-5.36 U	0.206 U
Cobalt-60	D	E901.1	pCi/L	0.528 U	-4.3 U	4.38 U	8.29	-5.84 U
Europium-152	T	E901.1	pCi/L	22.2	16.6 U	19.9 U	18.9 U	6.04 U
Europium-152	D	E901.1	pCi/L	11.5 U	1.34 U	-3.28 U	2.69 U	-6.04 U
Europium-154	T	E901.1	pCi/L	-46 U	-2.07 U	20.5 U	5.76 U	18.1 U
Europium-154	D	E901.1	pCi/L	44.9	29.9 U	-55.3 U	-28.6 U	16.7 U
Europium-155	T	E901.1	pCi/L	-17.6 U	-7.16 U	3.68 U	0.818 U	-10.2 U
Europium-155	D	E901.1	pCi/L	-6.36 U	-1.84 U	-6.52 U	5.66 U	-13.8 U
Gross Alpha	T	E900	pCi/L	0.781 U	3.73	9.1	1.26 U	2.17 U
Gross Alpha	D	E900	pCi/L	0.225 U	1.38 U	3.37	2.3 U	2.02 U
Gross Beta	T	E900	pCi/L	2.32	3.93	5.11	1.91 U	1.48 U
Gross Beta	D	E900	pCi/L	1.63	5.05	4.03	4.65	3.83
Manganese-54	T	E901.1	pCi/L	4.27 U	3.7 U	-3.95 U	6.09 U	5.09 U
Manganese-54	D	E901.1	pCi/L	0.613 U	1.21 U	2.71 U	-8.42 U	3.6 U
Potassium-40	T	E901.1	pCi/L	15.1 U	35.5 U	-24.7 U	-40.2 U	-1.48 U
Potassium-40	D	E901.1	pCi/L	-205 U	26.7 U	-40.2 U	-65.5 U	-8.88 U
Radium-226	T	E903	pCi/L	0.235	0.56	1.42	0.504	0.664
Radium-226	D	E903	pCi/L	0.158	0.724	0.811	0.55	0.641
Radium-228	T	E904	pCi/L	0.622	1.2	1.52	0.24 U	1.42 UJ
Radium-228	D	E904	pCi/L	0.0759 U	1.23	1.06	0.162 U	0.95
Sodium-22	T	E901.1	pCi/L	6.69 U	-5.63 U	-6.72 U	3.05 U	2.58 U
Sodium-22	D	E901.1	pCi/L	-6.5 U	1.49 U	4.5 U	-4.43 U	0.469 U
Strontium-90	T	E905	pCi/L	0.0984 U	-0.0492 U	0.137 U	0.0032 U	0.172 U

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-34B	RD-34C	RD-54A	RD-59A	RD-59B
			Sample Name	RD-34B_030118_01_L	RD-34C_030218_01_L	RD-54A_030118_01_L	RD-59A_022818_01_L	RD-59B_022818_01_L
			Sample Date	3/1/2018	3/2/2018	3/1/2018	2/28/2018	2/28/2018
			Lab Name	TA STL	TA STL	TA STL	TA STL	TA STL
			Sample Type	N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Strontium-90	D	E905	pCi/L	0.333	-0.0091 U	0.0747 U	0.363	0.132 U
Tritium	T	E906.0	pCi/L	----	----	----	----	----
Uranium-233/234	T	A-01-R	pCi/L	0.0186 U	0.118 U	2.95	1.72	0.278
Uranium-233/234	D	A-01-R	pCi/L	-0.00662 U	0.091 U	2.97	2.12	0.25
Uranium-235/236	T	A-01-R	pCi/L	-0.00533 U	0 U	0.161	0.0279 U	0.0274 U
Uranium-235/236	D	A-01-R	pCi/L	0.0214 U	-0.00459 U	0 U	0.0588 U	-0.00501 U
Uranium-238	T	A-01-R	pCi/L	0 U	-0.0122 U	2.84	1.41	0.11
Uranium-238	D	A-01-R	pCi/L	0.0383 U	0.00859 U	2.3	1.2	0.0857 U

NOTES AND ABBREVIATIONS

pCi/L - picocuries per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA STL - Test America St. Louis, Missouri

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		RD-59C	RD-59C	RD-63	RD-90	RD-90
		Sample Name		RD-59C_022818_01_L	RD-59C_022818_36_L	RD-63_022118_01_L	RD-90_022218_01_L	RD-90_022218_36_L
		Sample Date		2/28/2018	2/28/2018	2/21/2018	2/22/2018	2/22/2018
		Lab Name		TA STL	TA STL	TA STL	TA STL	TA STL
		Sample Type		N	FD	N	N	FD
Analyte	**Fraction**	**Method**	**Units**					
Actinium-228	T	E901.1	pCi/L	34.8 U	16.5 U	14.2 U	----	----
Actinium-228	D	E901.1	pCi/L	16 U	24.9 U	18.2 U	----	----
Americium-241	T	E901.1	pCi/L	-0.353 U	2.31 U	11.5 U	----	----
Americium-241	D	E901.1	pCi/L	-10.9 U	2.21 U	12.4 U	----	----
Antimony-125	T	E901.1	pCi/L	-22.5 U	7.64 U	37.6 U	----	----
Antimony-125	D	E901.1	pCi/L	4.52 U	4.29 U	0.722 U	----	----
Barium-133	T	E901.1	pCi/L	3.79 U	7.04 U	-5.52 U	----	----
Barium-133	D	E901.1	pCi/L	-4.23 U	-6.09 U	-8.18 U	----	----
Cesium-134	T	E901.1	pCi/L	5.01 U	2.6 U	12.3 U	----	----
Cesium-134	D	E901.1	pCi/L	0.598 U	11.9 U	10.2 U	----	----
Cesium-137	T	E901.1	pCi/L	-6 U	-3.94 U	-8.86 U	----	----
Cesium-137	D	E901.1	pCi/L	-1.12 U	0.683 U	-12.2 U	----	----
Cobalt-57	T	E901.1	pCi/L	2.73 U	-3.54 U	3.61 U	----	----
Cobalt-57	D	E901.1	pCi/L	0.921 U	-1.99 U	3.82 U	----	----
Cobalt-60	T	E901.1	pCi/L	8.13 U	3.67 U	-7.50 U	----	----
Cobalt-60	D	E901.1	pCi/L	-0.876 U	6.75	-7.65 U	----	----
Europium-152	T	E901.1	pCi/L	-10.8 U	9.54 U	-14.8 U	----	----
Europium-152	D	E901.1	pCi/L	4.68 U	-1.04 U	-0.483 U	----	----
Europium-154	T	E901.1	pCi/L	19 U	8.74 U	55.9 U	----	----
Europium-154	D	E901.1	pCi/L	4.85 U	-35 U	-61.2 U	----	----
Europium-155	T	E901.1	pCi/L	8.15 U	-3.58 U	19.7 U	----	----
Europium-155	D	E901.1	pCi/L	4.71 U	9.05 U	-2.83 U	----	----
Gross Alpha	T	E900	pCi/L	3.86	2.92	15.9	----	----
Gross Alpha	D	E900	pCi/L	1.25 U	2.74 U	12.8	----	----
Gross Beta	T	E900	pCi/L	2.97	1.79 U	8.17	----	----
Gross Beta	D	E900	pCi/L	2.6	0.985 U	4.43	----	----
Manganese-54	T	E901.1	pCi/L	-0.89 U	4.41 U	-0.0930 U	----	----
Manganese-54	D	E901.1	pCi/L	1.32 U	-1.54 U	-7.37 U	----	----
Potassium-40	T	E901.1	pCi/L	-20.8 U	-114 U	75.4 U	----	----
Potassium-40	D	E901.1	pCi/L	-27.9 U	-21.3 U	-19.6 U	----	----
Radium-226	T	E903	pCi/L	0.455	0.492	1.18	----	----
Radium-226	D	E903	pCi/L	0.572	0.542	1.25	----	----
Radium-228	T	E904	pCi/L	1.09 UJ	1.09 UJ	2.34	----	----
Radium-228	D	E904	pCi/L	0.675	0.967	0.838	----	----
Sodium-22	T	E901.1	pCi/L	3.73 U	1.05 U	8.95 U	----	----
Sodium-22	D	E901.1	pCi/L	-7.03 U	4.4 U	3.84 U	----	----
Strontium-90	T	E905	pCi/L	0.0458 U	0.177 U	0.0945 U	----	----

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-59C	RD-59C	RD-63	RD-90	RD-90
			Sample Name	RD-59C_022818_01_L	RD-59C_022818_36_L	RD-63_022118_01_L	RD-90_022218_01_L	RD-90_022218_36_L
			Sample Date	2/28/2018	2/28/2018	2/21/2018	2/22/2018	2/22/2018
			Lab Name	TA STL	TA STL	TA STL	TA STL	TA STL
			Sample Type	N	FD	N	N	FD
Analyte	**Fraction**	**Method**	**Units**					
Strontium-90	D	E905	pCi/L	0.0326 U	0.464	0.143 U	----	----
Tritium	T	E906.0	pCi/L	----	----	----	31600	31500
Uranium-233/234	T	A-01-R	pCi/L	0.214	0.247	4.40	----	----
Uranium-233/234	D	A-01-R	pCi/L	0.214	0.201	3.49	----	----
Uranium-235/236	T	A-01-R	pCi/L	0 U	0 U	0.252	----	----
Uranium-235/236	D	A-01-R	pCi/L	0.0157 U	0 U	0.214	----	----
Uranium-238	T	A-01-R	pCi/L	0.123	0.145	5.34	----	----
Uranium-238	D	A-01-R	pCi/L	0.117	0 U	4.00	----	----

NOTES AND ABBREVIATIONS

pCi/L - picocuries per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA STL - Test America St. Louis, Missouri

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		RD-95	RD-96	RD-98
		Sample Name		RD-95_022218_01_L	RD-96_022118_01_L	RD-98_022818_01_L
		Sample Date		2/22/2018	2/21/2018	2/28/2018
		Lab Name		TA STL	TA STL	TA STL
		Sample Type		N	N	N
Analyte	**Fraction**	**Method**	**Units**			
Actinium-228	T	E901.1	pCi/L	----	-46.6 U	-40.2 U
Actinium-228	D	E901.1	pCi/L	----	4.38 U	25.6 U
Americium-241	T	E901.1	pCi/L	----	1.20 U	0.529 U
Americium-241	D	E901.1	pCi/L	----	7.61 U	9.25 U
Antimony-125	T	E901.1	pCi/L	----	3.95 U	10.1 U
Antimony-125	D	E901.1	pCi/L	----	-0.246 U	8.8 U
Barium-133	T	E901.1	pCi/L	----	5.02 U	10.1 U
Barium-133	D	E901.1	pCi/L	----	4.13 U	-0.694 U
Cesium-134	T	E901.1	pCi/L	----	2.71 U	2.38 U
Cesium-134	D	E901.1	pCi/L	----	-5.68 U	5.17 U
Cesium-137	T	E901.1	pCi/L	----	-5.67 U	1.63 U
Cesium-137	D	E901.1	pCi/L	----	-7.57 U	0.972 U
Cobalt-57	T	E901.1	pCi/L	----	0.869 U	0.486 U
Cobalt-57	D	E901.1	pCi/L	----	1.43 U	-3.81 U
Cobalt-60	T	E901.1	pCi/L	----	10.7	1.53 U
Cobalt-60	D	E901.1	pCi/L	----	0.994 U	-3.05 U
Europium-152	T	E901.1	pCi/L	----	8.36 U	10.3 U
Europium-152	D	E901.1	pCi/L	----	6.39 U	16.8 U
Europium-154	T	E901.1	pCi/L	----	12.6 U	46.1
Europium-154	D	E901.1	pCi/L	----	-51.7 U	8.02 U
Europium-155	T	E901.1	pCi/L	----	-7.16 U	-1.58 U
Europium-155	D	E901.1	pCi/L	----	7.07 U	4.71 U
Gross Alpha	T	E900	pCi/L	----	11.8	10.7
Gross Alpha	D	E900	pCi/L	----	8.00	3.26 U
Gross Beta	T	E900	pCi/L	----	10.5	123
Gross Beta	D	E900	pCi/L	----	7.89	119
Manganese-54	T	E901.1	pCi/L	----	-4.92 U	-5.48 U
Manganese-54	D	E901.1	pCi/L	----	-6.36 U	-2.57 U
Potassium-40	T	E901.1	pCi/L	----	38.4 U	-112 U
Potassium-40	D	E901.1	pCi/L	----	1.35 U	-114 U
Radium-226	T	E903	pCi/L	----	1.24	0.275
Radium-226	D	E903	pCi/L	----	1.11	0.206
Radium-228	T	E904	pCi/L	----	1.83 J	13.1
Radium-228	D	E904	pCi/L	----	1.61 J	12.2
Sodium-22	T	E901.1	pCi/L	----	2.10 U	-2.61 U
Sodium-22	D	E901.1	pCi/L	----	-1.48 U	4.45 U
Strontium-90	T	E905	pCi/L	----	0.114 U	65.8

TABLE 14
RADIOCHEMISTRY ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

			Well Identifier	RD-95	RD-96	RD-98
			Sample Name	RD-95_022218_01_L	RD-96_022118_01_L	RD-98_022818_01_L
			Sample Date	2/22/2018	2/21/2018	2/28/2018
			Lab Name	TA STL	TA STL	TA STL
			Sample Type	N	N	N
Analyte	**Fraction**	**Method**	**Units**			
Strontium-90	D	E905	pCi/L	----	0.0277 U	75.7
Tritium	T	E906.0	pCi/L	31000	----	----
Uranium-233/234	T	A-01-R	pCi/L	----	6.49	4.03
Uranium-233/234	D	A-01-R	pCi/L	----	5.82	3.79
Uranium-235/236	T	A-01-R	pCi/L	----	0.323	0.13
Uranium-235/236	D	A-01-R	pCi/L	----	0.161 U	0.274
Uranium-238	T	A-01-R	pCi/L	----	4.99	1.93
Uranium-238	D	A-01-R	pCi/L	----	5.34	2.37

NOTES AND ABBREVIATIONS

pCi/L - picocuries per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA STL - Test America St. Louis, Missouri

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

UJ - Analyzed for, but not detected. Reported quantitation limit is approximate and may be inaccurate or imprecise. Result shown is the Method Detection Limit.

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

TABLE 15
METALS ANALYTICAL RESULTS, 2018 - AREA IV
SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CA

		Well Identifier		C-8	DD-139	DD-140	DD-141	DD-142
		Sample Name		C-8_021918_01_L	DD-139_022218_01_L	DD-140_022718_01_L	DD-141_022718_01_L	DD-142_022218_01_L
		Sample Date		2/19/2018	2/22/2018	2/27/2018	2/27/2018	2/22/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Aluminum	T	SW6010C	mg/L	0.11	0.47 J+	0.055 J	2	0.98 J+
Aluminum	D	SW6010C	mg/L	0.1 U	0.1 U	0.039 J	0.062 J	0.1 U
Antimony	T	SW6020A	mg/L	0.002 U	0.00097 U	0.002 U	0.002 U	0.002 U
Antimony	D	SW6020A	mg/L	0.002 U	0.0014 U	0.002 U	0.002	0.002 U
Arsenic	T	SW6020A	mg/L	0.0015 J	0.00061 J	0.0019 J	0.0015 J	0.0011 J
Arsenic	D	SW6020A	mg/L	0.0015 J	0.0006 J	0.002 J	0.00085 J	0.005 U
Barium	T	SW6020A	mg/L	0.045	0.04	0.023	0.093	0.043
Barium	D	SW6020A	mg/L	0.052	0.038	0.023	0.073	0.03
Beryllium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.00017 J	0.00011 J
Beryllium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.00021 J	0.001 U
Boron	T	SW6010C	mg/L	0.027 J	0.035 J	0.035 J	0.039 J	0.43
Boron	D	SW6010C	mg/L	0.026 U	0.038 U	0.03 J	0.049 J	0.39
Cadmium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	100	110	110	110	110
Calcium	D	SW6010C	mg/L	85	110	100	120	100
Chromium	T	SW6020A	mg/L	0.002 U	0.0013 J	0.002 U	0.005	0.0025
Chromium	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	SW6020A	mg/L	0.00095 J	0.0021	0.0011	0.01	0.00092 J
Cobalt	D	SW6020A	mg/L	0.00073 J	0.00017 J	0.001	0.00048 J	0.001 U
Copper	T	SW6020A	mg/L	0.00074 J	0.002 U	0.0012 J	0.0036	0.0035
Copper	D	SW6020A	mg/L	0.002 U	0.00068 J	0.00061 J	0.002 U	0.002 U
Iron	T	SW6010C	mg/L	0.32	1.4 J+	0.36	3.3	1.5 J+
Iron	D	SW6010C	mg/L	0.1 U	0.054 U	0.14	0.11	0.022 U
Lead	T	SW6020A	mg/L	0.00025 J+	0.00077 U	0.00032 J	0.0022	0.0013
Lead	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.00023 U	0.001 U
Magnesium	T	SW6010C	mg/L	6.7 J	15	22	26	22
Magnesium	D	SW6010C	mg/L	5.8 J	15	21	23	20
Manganese	T	SW6020A	mg/L	0.014	0.057 J+	0.1	0.43	0.18
Manganese	D	SW6020A	mg/L	0.0023	0.01	0.1 J-	0.026	0.0017
Mercury	T	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.0018 U	0.0014 J	0.0042	0.0018 J	0.002 J+
Molybdenum	D	SW6020A	mg/L	0.002	0.0013 J	0.0045	0.0015 J	0.0014 J
Nickel	T	SW6020A	mg/L	0.00096 J	0.0021	0.0018 J	0.0055	0.0018 J
Nickel	D	SW6020A	mg/L	0.0011 J	0.0024	0.0018 J	0.00081 J	0.0004 J
Potassium	T	SW6010C	mg/L	3.2	4.5	4.8	5	4.5
Potassium	D	SW6010C	mg/L	2.7 J	4.8	4.4	4.4	3.9

		Well Identifier		C-8	DD-139	DD-140	DD-141	DD-142
		Sample Name		C-8_021918_01_L	DD-139_022218_01_L	DD-140_022718_01_L	DD-141_022718_01_L	DD-142_022218_01_L
		Sample Date		2/19/2018	2/22/2018	2/27/2018	2/27/2018	2/22/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Selenium	T	SW6020A	mg/L	0.005 U	0.00089 J	0.005 U	0.005 U	0.0043 J
Selenium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.0035 J
Silver	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.000064 J	0.005 U
Silver	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.000033 J	0.005 U
Sodium	T	SW6010C	mg/L	38	35	46	44	140
Sodium	D	SW6010C	mg/L	32	35	43	44	120
Strontium	T	SW6010C	mg/L	0.36	0.31	0.3	0.3	0.3
Strontium	D	SW6010C	mg/L	0.3	0.32	0.28	0.29	0.27
Thallium	T	SW6020A	mg/L	0.001 U	0.000061 J	0.001 U	0.00011 J	0.000058 J
Thallium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.000093 J	0.001 U
Tin	T	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.005 U	0.0043 J	0.0017 J	0.0071	0.0052
Vanadium	D	SW6020A	mg/L	0.005 U	0.0018 U	0.0018 J	0.0015 J	0.005 U
Zinc	T	SW6020A	mg/L	0.026	0.0062 U	0.0038 J	0.019	0.013
Zinc	D	SW6020A	mg/L	0.024	0.063	0.0045 J	0.0023 J	0.01 U

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

		Well Identifier		DD-143	DD-143	DD-144	DD-145	DS-43
		Sample Name		DD-143_022618_01_L	DD-143_022618_36_L	DD-144_022218_01_L	DD-145_021918_01_L	DS-43_022218_01_L
		Sample Date		2/26/2018	2/26/2018	2/22/2018	2/19/2018	2/22/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	FD	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Aluminum	T	SW6010C	mg/L	0.71	0.44	0.63 J+	0.12	0.29 J+
Aluminum	D	SW6010C	mg/L	0.1 U	0.1 U	0.29	0.1 U	0.28
Antimony	T	SW6020A	mg/L	0.002 U	0.002 U	0.00048 U	0.002 U	0.002 U
Antimony	D	SW6020A	mg/L	0.002 U	0.002 U	0.0006 U	0.002 U	0.002 U
Arsenic	T	SW6020A	mg/L	0.001 J	0.0011 J	0.0017 J	0.00048 J	0.005 U
Arsenic	D	SW6020A	mg/L	0.00076 J	0.00078 J	0.00092 J	0.00034 J	0.005 U
Barium	T	SW6020A	mg/L	0.04	0.04	0.068	0.037	0.079
Barium	D	SW6020A	mg/L	0.033	0.034	0.071	0.036	0.085
Beryllium	T	SW6020A	mg/L	0.00013 J	0.000092 J	0.00011 J	0.001 U	0.00011 J
Beryllium	D	SW6020A	mg/L	0.001 U	0.001 U	0.00045 J	0.001 U	0.001 U
Boron	T	SW6010C	mg/L	0.083 J	0.079 J	0.14	0.071 J	0.16
Boron	D	SW6010C	mg/L	0.085 J	0.083 J	0.14	0.071 U	0.16
Cadmium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	160	160	120	100	86
Calcium	D	SW6010C	mg/L	170	170	120	99	82
Chromium	T	SW6020A	mg/L	0.0016 J	0.0013 J	0.0022	0.00094 U	0.00069 J
Chromium	D	SW6020A	mg/L	0.002 U	0.002 U	0.00061 J	0.002 U	0.002 U
Cobalt	T	SW6020A	mg/L	0.00044 J	0.00039 J	0.0011	0.00031 J	0.0003 U
Cobalt	D	SW6020A	mg/L	0.00022 J	0.00026 J	0.00067 J	0.00023 J	0.00027 J
Copper	T	SW6020A	mg/L	0.0013 J	0.00088 J	0.0027	0.00063 J	0.00091 U
Copper	D	SW6020A	mg/L	0.002 U	0.002 U	0.00061 J	0.002 U	0.002 U
Iron	T	SW6010C	mg/L	1.7	1.3	8.7 J+	0.76	2.5 J+
Iron	D	SW6010C	mg/L	0.19	0.18	4.5	0.11	1.5
Lead	T	SW6020A	mg/L	0.0011	0.00063 J	0.0016	0.001 U	0.00054 U
Lead	D	SW6020A	mg/L	0.001 U	0.001 U	0.00053 J	0.001 U	0.00024 J
Magnesium	T	SW6010C	mg/L	31	29	20	12 J	23
Magnesium	D	SW6010C	mg/L	31	30	20	11 J	23
Manganese	T	SW6020A	mg/L	0.1	0.098	0.14 J+	0.035	0.048
Manganese	D	SW6020A	mg/L	0.074 J	0.074 J	0.08	0.023	0.044
Mercury	T	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.0035	0.0036	0.0016 J	0.002 U	0.0028
Molybdenum	D	SW6020A	mg/L	0.0037	0.0038	0.0015 J	0.0022	0.0024
Nickel	T	SW6020A	mg/L	0.0014 J	0.0011 J	0.0034	0.0011 J	0.00092 J
Nickel	D	SW6020A	mg/L	0.00092 J	0.0009 J	0.0026	0.00096 J	0.0011 J
Potassium	T	SW6010C	mg/L	5.4	5.1	5.9	3.8	6.2
Potassium	D	SW6010C	mg/L	5.4	5.4	5.5	3.7	5.7

		Well Identifier		DD-143	DD-143	DD-144	DD-145	DS-43
		Sample Name		DD-143_022618_01_L	DD-143_022618_36_L	DD-144_022218_01_L	DD-145_021918_01_L	DS-43_022218_01_L
		Sample Date		2/26/2018	2/26/2018	2/22/2018	2/19/2018	2/22/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	FD	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Selenium	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.0012 J	0.005 U
Selenium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	D	SW6020A	mg/L	0.005 U	0.005 U	0.000039 J	0.005 U	0.005 U
Sodium	T	SW6010C	mg/L	62	60	71	74	150
Sodium	D	SW6010C	mg/L	64	62	66	70	140
Strontium	T	SW6010C	mg/L	0.33	0.32	0.28	0.46	0.3
Strontium	D	SW6010C	mg/L	0.35	0.34	0.26	0.45	0.28
Thallium	T	SW6020A	mg/L	0.001 U	0.001 U	0.000072 J	0.001 U	0.001 U
Thallium	D	SW6020A	mg/L	0.001 U	0.001 U	0.00016 J	0.001 U	0.001 U
Tin	T	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.0019 U	0.0017 U	0.0078	0.005 U	0.0012 J
Vanadium	D	SW6020A	mg/L	0.005 U	0.005 U	0.0025 U	0.005 U	0.005 U
Zinc	T	SW6020A	mg/L	0.016	0.012	0.0079 U	0.01 U	0.0091 U
Zinc	D	SW6020A	mg/L	0.0026 J	0.0025 J	0.003 J	0.0035 J	0.0024 J

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

		Well Identifier		DS-44	DS-46	DS-47	PZ-105	PZ-108
		Sample Name		DS-44_022318_01_L	DS-46_022718_01_L	DS-47_022318_01_L	PZ-105_021918_01_L	PZ-108_021918_01_L
		Sample Date		2/23/2018	2/27/2018	2/23/2018	2/19/2018	2/19/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Aluminum	T	SW6010C	mg/L	1 J+	0.049 J	0.066 J+	0.4	0.29
Aluminum	D	SW6010C	mg/L	0.064 J	0.1 U	0.1 U	0.1 U	0.036 J
Antimony	T	SW6020A	mg/L	0.00041 U	0.00068 J	0.002 U	0.00061 U	0.00087 U
Antimony	D	SW6020A	mg/L	0.002 U	0.00068 J	0.002 U	0.00046 UJ	0.002 U
Arsenic	T	SW6020A	mg/L	0.00086 J	0.00038 J	0.00067 J	0.0012 J	0.00098 J
Arsenic	D	SW6020A	mg/L	0.00059 J	0.005 U	0.0011 J	0.0007 J	0.001 J
Barium	T	SW6020A	mg/L	0.051 J+	0.052	0.042 J+	0.032	0.027
Barium	D	SW6020A	mg/L	0.045	0.057	0.043	0.028	0.026
Beryllium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	D	SW6020A	mg/L	0.000096 J	0.001 U	0.001 U	0.001 U	0.001 U
Boron	T	SW6010C	mg/L	0.09 J	0.038 J	0.042 J	0.14	0.18
Boron	D	SW6010C	mg/L	0.088 J	0.035 J	0.039 J	0.14	0.17
Cadmium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.00027 J
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	110	130	85	110	140
Calcium	D	SW6010C	mg/L	96	120	79	100	130
Chromium	T	SW6020A	mg/L	0.0013 J	0.002 U	0.002 U	0.0051	0.0023
Chromium	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.0047	0.0016 J
Cobalt	T	SW6020A	mg/L	0.00087 J	0.0021	0.0008 J	0.00036 J	0.00028 J
Cobalt	D	SW6020A	mg/L	0.00034 J	0.0012	0.0001 J	0.000062 J	0.00012 J
Copper	T	SW6020A	mg/L	0.0046 J+	0.0014 J	0.0019 U	0.0021	0.0025
Copper	D	SW6020A	mg/L	0.00056 J	0.0016 J	0.002 U	0.0013 J	0.0016 J
Iron	T	SW6010C	mg/L	1.6 J+	2.8	0.23 J+	0.64	0.49
Iron	D	SW6010C	mg/L	0.24	0.87	0.1 U	0.029 J	0.094 J
Lead	T	SW6020A	mg/L	0.00094 U	0.001 U	0.00053 U	0.00038 J	0.00022 J
Lead	D	SW6020A	mg/L	0.00032 J	0.001 U	0.00019 J	0.001 U	0.001 U
Magnesium	T	SW6010C	mg/L	21	19	20	21 J	33 J
Magnesium	D	SW6010C	mg/L	19	18	19	19 J	31 J
Manganese	T	SW6020A	mg/L	0.19 J	0.1	0.0095 J	0.035	0.065
Manganese	D	SW6020A	mg/L	0.089	0.07	0.0015 J+	0.0057	0.049
Mercury	T	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.0081	0.00045 J	0.0037	0.016	0.0081
Molybdenum	D	SW6020A	mg/L	0.0078	0.00051 J	0.004	0.018	0.0085
Nickel	T	SW6020A	mg/L	0.002	0.0079	0.0014 J	0.0014 J	0.0028
Nickel	D	SW6020A	mg/L	0.00095 J	0.0082	0.001 J	0.00089 J	0.0023
Potassium	T	SW6010C	mg/L	4.6	4.9	4.6	6.4	7.6
Potassium	D	SW6010C	mg/L	3.8	4.3	4.3	5.9	7

		Well Identifier		DS-44	DS-46	DS-47	PZ-105	PZ-108
		Sample Name		DS-44_022318_01_L	DS-46_022718_01_L	DS-47_022318_01_L	PZ-105_021918_01_L	PZ-108_021918_01_L
		Sample Date		2/23/2018	2/27/2018	2/23/2018	2/19/2018	2/19/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Selenium	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.0015 J	0.005 U
Selenium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	T	SW6020A	mg/L	0.0004 J	0.005 U	0.005 U	0.005 U	0.00019 U
Silver	D	SW6020A	mg/L	0.000059 U	0.005 U	0.005 U	0.005 U	0.000036 J
Sodium	T	SW6010C	mg/L	53	52	39	93	81
Sodium	D	SW6010C	mg/L	51	52	37	88	82
Strontium	T	SW6010C	mg/L	0.29	0.39	0.27	0.49	0.36
Strontium	D	SW6010C	mg/L	0.26	0.34	0.25	0.46	0.34
Thallium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	SW6020A	mg/L	0.000093 J	0.001 U	0.000073 J	0.001 U	0.001 U
Tin	T	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.0033 J	0.005 U	0.0037 J	0.0012 U	0.005 U
Vanadium	D	SW6020A	mg/L	0.0015 J	0.005 U	0.003 J	0.0012 U	0.00069 U
Zinc	T	SW6020A	mg/L	0.0055 U	0.0026 J	0.0052 U	0.013	0.0087 J
Zinc	D	SW6020A	mg/L	0.01 U	0.0029 J	0.0058 U	0.039	0.0076 J

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

		Well Identifier		PZ-120	RD-07	RD-17	RD-19	RD-21
		Sample Name		PZ-120_022618_01_L	RD-07_022618_01_L	RD-17_030218_01_L	RD-19_022818_01_L	RD-21_022018_01_L
		Sample Date		2/26/2018	2/26/2018	3/2/2018	2/28/2018	2/20/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Aluminum	T	SW6010C	mg/L	1.6	0.1 U	0.1 U	0.1 U	0.064 J
Aluminum	D	SW6010C	mg/L	0.097 J	0.1 U	0.1 U	0.1 U	0.1 U
Antimony	T	SW6020A	mg/L	0.0015 J	0.002 U	0.002 U	0.002 U	0.002 U
Antimony	D	SW6020A	mg/L	0.00054 J	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	SW6020A	mg/L	0.0028 J	0.005 U	0.00055 J	0.005 U	0.005 U
Arsenic	D	SW6020A	mg/L	0.0018 J	0.005 U	0.005 U	0.005 U	0.005 U
Barium	T	SW6020A	mg/L	0.046	0.035	0.13	0.081	0.045
Barium	D	SW6020A	mg/L	0.014	0.036	0.12	0.08	0.05
Beryllium	T	SW6020A	mg/L	0.00012 J	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	T	SW6010C	mg/L	1.3	0.088 J	0.14	0.11	0.053 J
Boron	D	SW6010C	mg/L	1.4	0.083 J	0.15	0.1	0.053 U
Cadmium	T	SW6020A	mg/L	0.00034 J	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	73	97	100	210	110
Calcium	D	SW6010C	mg/L	73	100	100	190	110
Chromium	T	SW6020A	mg/L	0.011	0.002 U	0.002 U	0.00065 J	0.002 U
Chromium	D	SW6020A	mg/L	0.0045	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	SW6020A	mg/L	0.0025	0.000054 J	0.0016	0.001 U	0.0001 J
Cobalt	D	SW6020A	mg/L	0.00035 J	0.001 U	0.0015	0.0001 J	0.001 U
Copper	T	SW6020A	mg/L	0.046	0.002 U	0.002 U	0.002 U	0.002 U
Copper	D	SW6020A	mg/L	0.0045	0.002 U	0.002 U	0.00078 J	0.00079 J
Iron	T	SW6010C	mg/L	2.4	0.1 U	7.4	0.04 J	0.28
Iron	D	SW6010C	mg/L	0.18	0.1 U	6.2	0.1 U	0.1 U
Lead	T	SW6020A	mg/L	0.02	0.001 U	0.0083	0.001 U	0.00037 J+
Lead	D	SW6020A	mg/L	0.0012	0.001 U	0.0008 U	0.0007 U	0.001 U
Magnesium	T	SW6010C	mg/L	15	14	22	42	6.8 J
Magnesium	D	SW6010C	mg/L	15	13	23	38	6.9 J
Manganese	T	SW6020A	mg/L	1.1	0.0045	0.18	0.0019	0.0042
Manganese	D	SW6020A	mg/L	0.069 J	0.0016 J	0.18	0.01	0.0012
Mercury	T	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.018	0.0011 J	0.00053 J	0.00075 J	0.0023
Molybdenum	D	SW6020A	mg/L	0.017	0.0011 J	0.00058 J	0.00076 J	0.0024
Nickel	T	SW6020A	mg/L	0.012	0.00037 J	0.00087 J	0.0023	0.00043 J
Nickel	D	SW6020A	mg/L	0.0049	0.00041 J	0.0011 J	0.0019 J	0.002 U
Potassium	T	SW6010C	mg/L	2.9 J	2.9 J	3.8	6.7	2 J
Potassium	D	SW6010C	mg/L	2.5 J	3	4.5	6.1	2 J

		Well Identifier		PZ-120	RD-07	RD-17	RD-19	RD-21
		Sample Name		PZ-120_022618_01_L	RD-07_022618_01_L	RD-17_030218_01_L	RD-19_022818_01_L	RD-21_022018_01_L
		Sample Date		2/26/2018	2/26/2018	3/2/2018	2/28/2018	2/20/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Selenium	T	SW6020A	mg/L	0.005 U	0.0013 J	0.005 U	0.005 U	0.0034 J
Selenium	D	SW6020A	mg/L	0.005 U	0.0012 J	0.005 U	0.005 U	0.0019 J
Silver	T	SW6020A	mg/L	0.00005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	T	SW6010C	mg/L	83	36	39	90	83
Sodium	D	SW6010C	mg/L	82	37	41	87	68
Strontium	T	SW6010C	mg/L	0.21	0.24	0.36	0.45	0.29
Strontium	D	SW6010C	mg/L	0.21	0.24	0.36	0.41	0.29
Thallium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tin	T	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.0069	0.005 U	0.005 U	0.005 U	0.005 U
Vanadium	D	SW6020A	mg/L	0.0023 U	0.005 U	0.005 U	0.005 U	0.005 U
Zinc	T	SW6020A	mg/L	0.35	0.011	1.8	0.2	0.026
Zinc	D	SW6020A	mg/L	0.066	0.012	1.4	0.18	0.022

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

		Well Identifier		RD-33A	RD-33B	RD-33C	RD-34A	RD-34B
		Sample Name		RD-33A_030118_01_L	RD-33B_022018_01_L	RD-33C_022118_01_L	RD-34A_030218_01_L	RD-34B_030118_01_L
		Sample Date		3/1/2018	2/20/2018	2/21/2018	3/2/2018	3/1/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Aluminum	T	SW6010C	mg/L	0.018 J	0.1 U	0.1 U	0.1 U	0.1 U
Aluminum	D	SW6010C	mg/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Antimony	T	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Antimony	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	SW6020A	mg/L	0.0032 J	0.005 U	0.005 U	0.005 U	0.005 U
Arsenic	D	SW6020A	mg/L	0.0026 J	0.005 U	0.005 U	0.005 U	0.005 U
Barium	T	SW6020A	mg/L	0.05	0.027	0.068	0.038	0.0079
Barium	D	SW6020A	mg/L	0.047	0.029	0.066	0.036	0.0065
Beryllium	T	SW6020A	mg/L	0.00012 J	0.001 U	0.001 U	0.001 U	0.001 U
Beryllium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Boron	T	SW6010C	mg/L	0.024 J	0.019 J	0.031 J	0.13	0.021 J
Boron	D	SW6010C	mg/L	0.021 J	0.024 J	0.032 J	0.13	0.02 J
Cadmium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	65	24	68	160	2.8
Calcium	D	SW6010C	mg/L	63	23	69	160	2.4
Chromium	T	SW6020A	mg/L	0.00066 J	0.002 U	0.002 U	0.002 U	0.002 U
Chromium	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	SW6020A	mg/L	0.0002 J	0.001 U	0.00015 J	0.0018	0.000078 J
Cobalt	D	SW6020A	mg/L	0.000088 J	0.001 U	0.00016 J	0.001	0.001 U
Copper	T	SW6020A	mg/L	0.0052	0.0015 U	0.00089 U	0.0011 J	0.002 U
Copper	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Iron	T	SW6010C	mg/L	0.12	0.74	1.4	0.46	0.57
Iron	D	SW6010C	mg/L	0.044 J	0.46	2.1	0.14	0.1 U
Lead	T	SW6020A	mg/L	0.00099 J	0.00045 U	0.00055 U	0.001 U	0.00027 J
Lead	D	SW6020A	mg/L	0.001 U	0.001 U	0.00023 J	0.001 U	0.001 U
Magnesium	T	SW6010C	mg/L	14	6.2	14	40	0.25
Magnesium	D	SW6010C	mg/L	14	6.3	14	40	0.23
Manganese	T	SW6020A	mg/L	0.018	0.034	0.16	0.18	0.0034
Manganese	D	SW6020A	mg/L	0.016	0.039	0.16	0.13	0.00057 J
Mercury	T	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.0013 J	0.0022	0.0014 J	0.00047 J	0.0017 J
Molybdenum	D	SW6020A	mg/L	0.0012 J	0.0023	0.0013 J	0.00062 J	0.0025
Nickel	T	SW6020A	mg/L	0.003	0.002 U	0.002 U	0.0015 J	0.002 U
Nickel	D	SW6020A	mg/L	0.0012 J	0.002 U	0.00039 J	0.0015 J	0.00054 J
Potassium	T	SW6010C	mg/L	3.1	3.2	3.5	4	2 J
Potassium	D	SW6010C	mg/L	3.1	2.9 J	3.5	4.3	2 J

		Well Identifier		RD-33A	RD-33B	RD-33C	RD-34A	RD-34B
		Sample Name		RD-33A_030118_01_L	RD-33B_022018_01_L	RD-33C_022118_01_L	RD-34A_030218_01_L	RD-34B_030118_01_L
		Sample Date		3/1/2018	2/20/2018	2/21/2018	3/2/2018	3/1/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	N
Analyte	**Fraction**	**Method**	**Units**					
Selenium	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Selenium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	T	SW6010C	mg/L	48	46	46	61	41
Sodium	D	SW6010C	mg/L	44	44	46	55	36
Strontium	T	SW6010C	mg/L	0.38	0.11	0.44	0.34	0.019
Strontium	D	SW6010C	mg/L	0.37	0.11	0.44	0.34	0.017
Thallium	T	SW6020A	mg/L	0.000068 J	0.001 U	0.001 U	0.001 U	0.001 U
Thallium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Tin	T	SW6020A	mg/L	0.00078 J	0.01 U	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005	0.005 U
Vanadium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Zinc	T	SW6020A	mg/L	0.13	0.012	0.047	0.04	0.13
Zinc	D	SW6020A	mg/L	0.028	0.0058 U	0.12	0.06	0.0076 J

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

		Well Identifier		RD-34C	RD-54A	RD-59A	RD-59B	RD-59B
		Sample Name		RD-34C_030218_01_L	RD-54A_030118_01_L	RD-59A_022818_01_L	RD-59B_022818_01_L	RD-59B_022818_36_L
		Sample Date		3/2/2018	3/1/2018	2/28/2018	2/28/2018	2/28/2018
		Lab Name		TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
		Sample Type		N	N	N	N	FD
Analyte	**Fraction**	**Method**	**Units**					
Aluminum	T	SW6010C	mg/L	0.1 U	2.3	0.1 U	0.1 U	0.1 U
Aluminum	D	SW6010C	mg/L	0.1 U	0.043 J	0.1 U	0.1 U	0.1 U
Antimony	T	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Antimony	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Arsenic	T	SW6020A	mg/L	0.005 U	0.0035 J	0.00085 J	0.005 U	0.005 U
Arsenic	D	SW6020A	mg/L	0.005 U	0.0015 J	0.001 J	0.005 U	0.005 U
Barium	T	SW6020A	mg/L	0.06	0.056	0.06	0.042	0.04
Barium	D	SW6020A	mg/L	0.055	0.05	0.062	0.041	0.04
Beryllium	T	SW6020A	mg/L	0.001 U	0.000081 J	0.001 U	0.001 U	0.001 U
Beryllium	D	SW6020A	mg/L	0.001 U	0.001 U	0.00034 J	0.001 U	0.001 U
Boron	T	SW6010C	mg/L	0.021 J	0.025 J	0.078 J	0.064 J	0.068 J
Boron	D	SW6010C	mg/L	0.018 J	0.025 J	0.073 J	0.074 J	0.066 J
Cadmium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	49	110	98	48	51
Calcium	D	SW6010C	mg/L	45	110	95	56	52
Chromium	T	SW6020A	mg/L	0.002 U	0.0053	0.002 U	0.002 U	0.002 U
Chromium	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Cobalt	T	SW6020A	mg/L	0.00029 J	0.0067	0.00018 J	0.001 U	0.001 U
Cobalt	D	SW6020A	mg/L	0.001 U	0.00029 J	0.00023 J	0.001 U	0.001 U
Copper	T	SW6020A	mg/L	0.002 U	0.035	0.002 U	0.0041	0.002 U
Copper	D	SW6020A	mg/L	0.002 U	0.002 U	0.0012 J	0.001 J	0.002 U
Iron	T	SW6010C	mg/L	3.5	12	0.1 U	0.073 J	0.13
Iron	D	SW6010C	mg/L	1.6	0.16	0.1 U	0.079 J	0.076 J
Lead	T	SW6020A	mg/L	0.00054 J	0.015	0.001 U	0.00026 J	0.001 U
Lead	D	SW6020A	mg/L	0.001 U	0.00068 U	0.001 U	0.00025 U	0.00027 U
Magnesium	T	SW6010C	mg/L	16	8.7	28	13	14
Magnesium	D	SW6010C	mg/L	14	8.2	27	16	14
Manganese	T	SW6020A	mg/L	0.049	0.3	0.35	0.023	0.022
Manganese	D	SW6020A	mg/L	0.047	0.0087	0.37	0.023	0.022
Mercury	T	SW7470A	mg/L	0.0002 U	0.00023	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.00091 J	0.0018 J	0.0024	0.0015 J	0.0014 J
Molybdenum	D	SW6020A	mg/L	0.0014 J	0.0013 J	0.0023	0.0012 J	0.0013 J
Nickel	T	SW6020A	mg/L	0.00032 J	0.0044	0.0015 J	0.002 U	0.002 U
Nickel	D	SW6020A	mg/L	0.002 U	0.001 J	0.0016 J	0.002 U	0.002 U
Potassium	T	SW6010C	mg/L	2.4 J	2.6 J	3.9	2.2 J	2.2 J
Potassium	D	SW6010C	mg/L	2.4 J	2.6 J	3.9	2.6 J	2.2 J

			Well Identifier	RD-34C	RD-54A	RD-59A	RD-59B	RD-59B
			Sample Name	RD-34C_030218_01_L	RD-54A_030118_01_L	RD-59A_022818_01_L	RD-59B_022818_01_L	RD-59B_022818_36_L
			Sample Date	3/2/2018	3/1/2018	2/28/2018	2/28/2018	2/28/2018
			Lab Name	TA DEN	TA DEN	TA DEN	TA DEN	TA DEN
			Sample Type	N	N	N	N	FD
Analyte	**Fraction**	**Method**	**Units**					
Selenium	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Selenium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Silver	T	SW6020A	mg/L	0.005 U	0.000037 J	0.005 U	0.005 U	0.005 U
Silver	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Sodium	T	SW6010C	mg/L	39	36	130	90	96
Sodium	D	SW6010C	mg/L	35	34	120	97	90
Strontium	T	SW6010C	mg/L	0.25	0.32	0.69	0.54	0.57
Strontium	D	SW6010C	mg/L	0.23	0.32	0.66	0.62	0.58
Thallium	T	SW6020A	mg/L	0.001 U	0.000062 J	0.001 U	0.001 U	0.001 U
Thallium	D	SW6020A	mg/L	0.001 U	0.001 U	0.000097 J	0.001 U	0.001 U
Tin	T	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.005 U	0.0048 J	0.005 U	0.005 U	0.005 U
Vanadium	D	SW6020A	mg/L	0.005 U	0.0006 J	0.005 U	0.005 U	0.005 U
Zinc	T	SW6020A	mg/L	0.35	0.53	0.01 U	0.011	0.0042 J
Zinc	D	SW6020A	mg/L	0.043	0.4	0.0055 J	0.0046 J	0.0042 J

NOTES AND ABBREVIATIONS

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FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

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J- - The result is an estimated quantity, but the result may be biased low.

		Well Identifier		RD-59C	RD-96	RD-96
		Sample Name		RD-59C_022818_01_L	RD-96_022118_01_L	RD-96_022118_36_L
		Sample Date		2/28/2018	2/21/2018	2/21/2018
		Lab Name		TA DEN	TA DEN	TA DEN
		Sample Type		N	N	FD
Analyte	**Fraction**	**Method**	**Units**			
Aluminum	T	SW6010C	mg/L	0.1 U	0.1 U	0.1 U
Aluminum	D	SW6010C	mg/L	0.1 U	0.1 U	0.1 U
Antimony	T	SW6020A	mg/L	0.002 U	0.002 U	0.002 U
Antimony	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U
Arsenic	T	SW6020A	mg/L	0.005 U	0.00038 J	0.00044 J
Arsenic	D	SW6020A	mg/L	0.005 U	0.00039 J	0.0006 J
Barium	T	SW6020A	mg/L	0.05	0.037	0.029
Barium	D	SW6020A	mg/L	0.051	0.037	0.038
Beryllium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Beryllium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Boron	T	SW6010C	mg/L	0.073 J	0.028 J	0.026 J
Boron	D	SW6010C	mg/L	0.072 J	0.025 J	0.026 J
Cadmium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Cadmium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Calcium	T	SW6010C	mg/L	31	120	120
Calcium	D	SW6010C	mg/L	28	100	100
Chromium	T	SW6020A	mg/L	0.002 U	0.002 U	0.00054 J
Chromium	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U
Cobalt	T	SW6020A	mg/L	0.001 U	0.00021 J	0.00023 J
Cobalt	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Copper	T	SW6020A	mg/L	0.002 U	0.002	0.0023
Copper	D	SW6020A	mg/L	0.002 U	0.002 U	0.002 U
Iron	T	SW6010C	mg/L	0.022 J	0.057 J	0.061 J
Iron	D	SW6010C	mg/L	0.1 U	0.1 U	0.1 U
Lead	T	SW6020A	mg/L	0.00019 J	0.00028 U	0.00021 U
Lead	D	SW6020A	mg/L	0.001 U	0.001 U	0.00037 J
Magnesium	T	SW6010C	mg/L	11	37	36
Magnesium	D	SW6010C	mg/L	10	33	32
Manganese	T	SW6020A	mg/L	0.014	0.023	0.019
Manganese	D	SW6020A	mg/L	0.016	0.0035	0.0034
Mercury	T	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U
Mercury	D	SW7470A	mg/L	0.0002 U	0.0002 U	0.0002 U
Molybdenum	T	SW6020A	mg/L	0.0012 J	0.00087 J	0.00069 J
Molybdenum	D	SW6020A	mg/L	0.0012 J	0.0012 J	0.0014 J
Nickel	T	SW6020A	mg/L	0.002 U	0.0026	0.0022
Nickel	D	SW6020A	mg/L	0.002 U	0.0012 J	0.00096 J
Potassium	T	SW6010C	mg/L	1.6 J	5.1	5.1
Potassium	D	SW6010C	mg/L	1.4 J	4.5	4.5

		Well Identifier		RD-59C	RD-96	RD-96
		Sample Name		RD-59C_022818_01_L	RD-96_022118_01_L	RD-96_022118_36_L
		Sample Date		2/28/2018	2/21/2018	2/21/2018
		Lab Name		TA DEN	TA DEN	TA DEN
		Sample Type		N	N	FD
Analyte	**Fraction**	**Method**	**Units**			
Selenium	T	SW6020A	mg/L	0.005 U	0.005 U	0.005 U
Selenium	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U
Silver	T	SW6020A	mg/L	0.005 U	0.000075 J	0.000071 J
Silver	D	SW6020A	mg/L	0.005 U	0.005 U	0.005 U
Sodium	T	SW6010C	mg/L	140	53	53
Sodium	D	SW6010C	mg/L	130	48	47
Strontium	T	SW6010C	mg/L	0.63	0.29	0.29
Strontium	D	SW6010C	mg/L	0.58	0.25	0.25
Thallium	T	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Thallium	D	SW6020A	mg/L	0.001 U	0.001 U	0.001 U
Tin	T	SW6020A	mg/L	0.01 U	0.01 U	0.01 U
Tin	D	SW6020A	mg/L	0.01 U	0.01 U	0.01 U
Vanadium	T	SW6020A	mg/L	0.005 U	0.00052 J	0.005 U
Vanadium	D	SW6020A	mg/L	0.005 U	0.005 U	0.00055 J
Zinc	T	SW6020A	mg/L	0.0045 J	0.01 U	0.0025 U
Zinc	D	SW6020A	mg/L	0.0029 J	0.0024 U	0.0022 U

NOTES AND ABBREVIATIONS

mg/L - milligrams per liter

---- - Not analyzed

N - Normal Sample

FD - Field Duplicate Sample

TA DEN - Test America Denver, Colorado

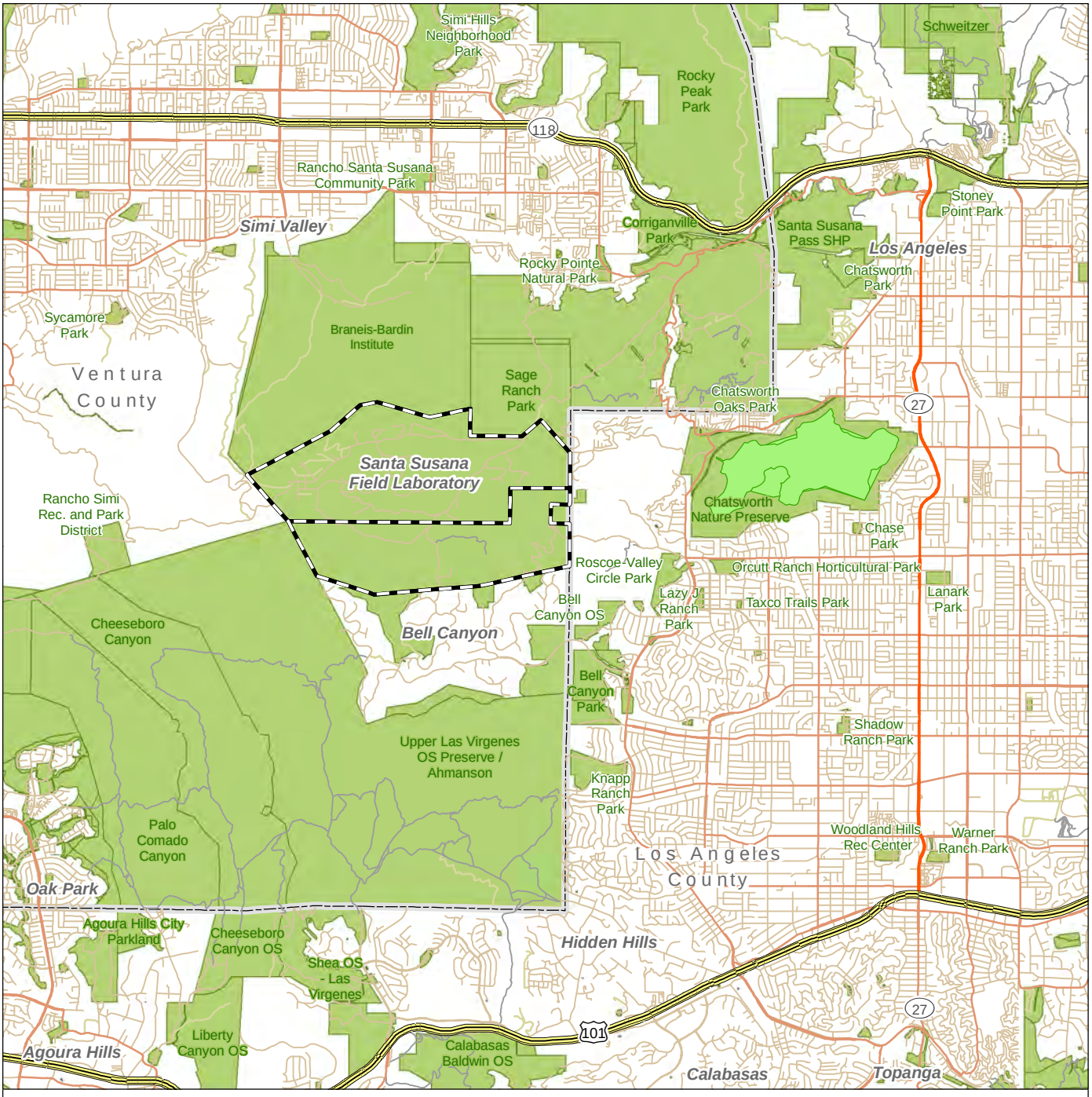
U - Analyzed for, but not detected above reported sample quantitation limit. Result shown is the Method Detection Limit (MDL).

J - Result is an estimated quantity. Associated numerical value is approximate concentration of analyte in sample.

J+ - The result is an estimated quantity, but the result may be biased high.

J- - The result is an estimated quantity, but the result may be biased low.

FIGURES



Notes:
- Original GIS layers provided by MWH/Boeing; updated by CDM Smith as needed.

Service Layer Credits:
- Park and Open Space Source: California Protected Areas Database (CPAD - www.calands.org), Santa Monica Mountains Conservancy, Mountains Recreation and Conservation Authority, National Park Service (2013); Protected Areas Database, US Geological Survey Gap Analysis Program, 2011; Ventura County Resource Management Agency, 2014.
- Street Source: Esri, TomTom, 2007.
- Census County Boundary Source: United States Census Bureau, TIGER/Line Shapefiles, August 2014.

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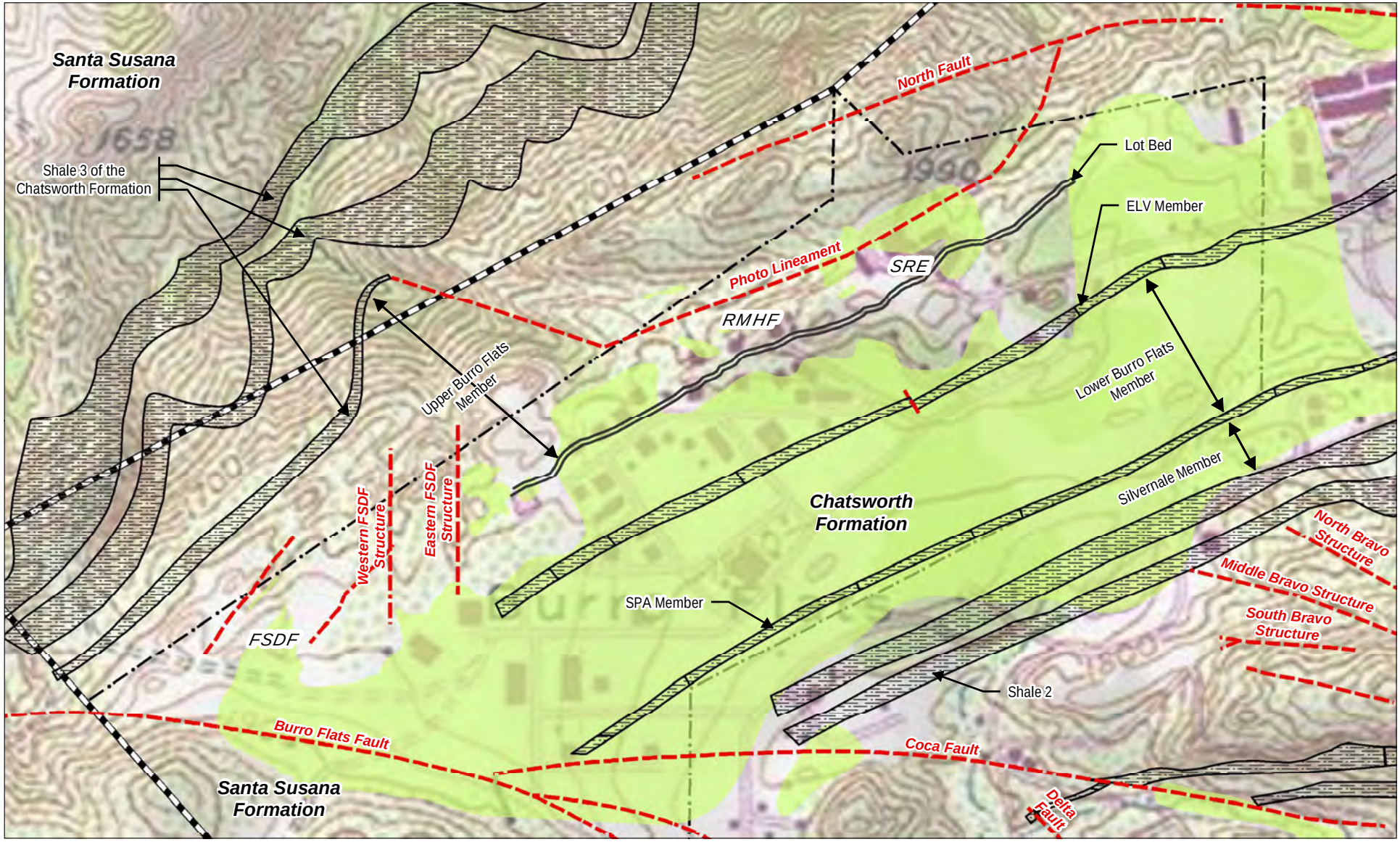
FIGURE 1
Facility Location Map



LEGEND

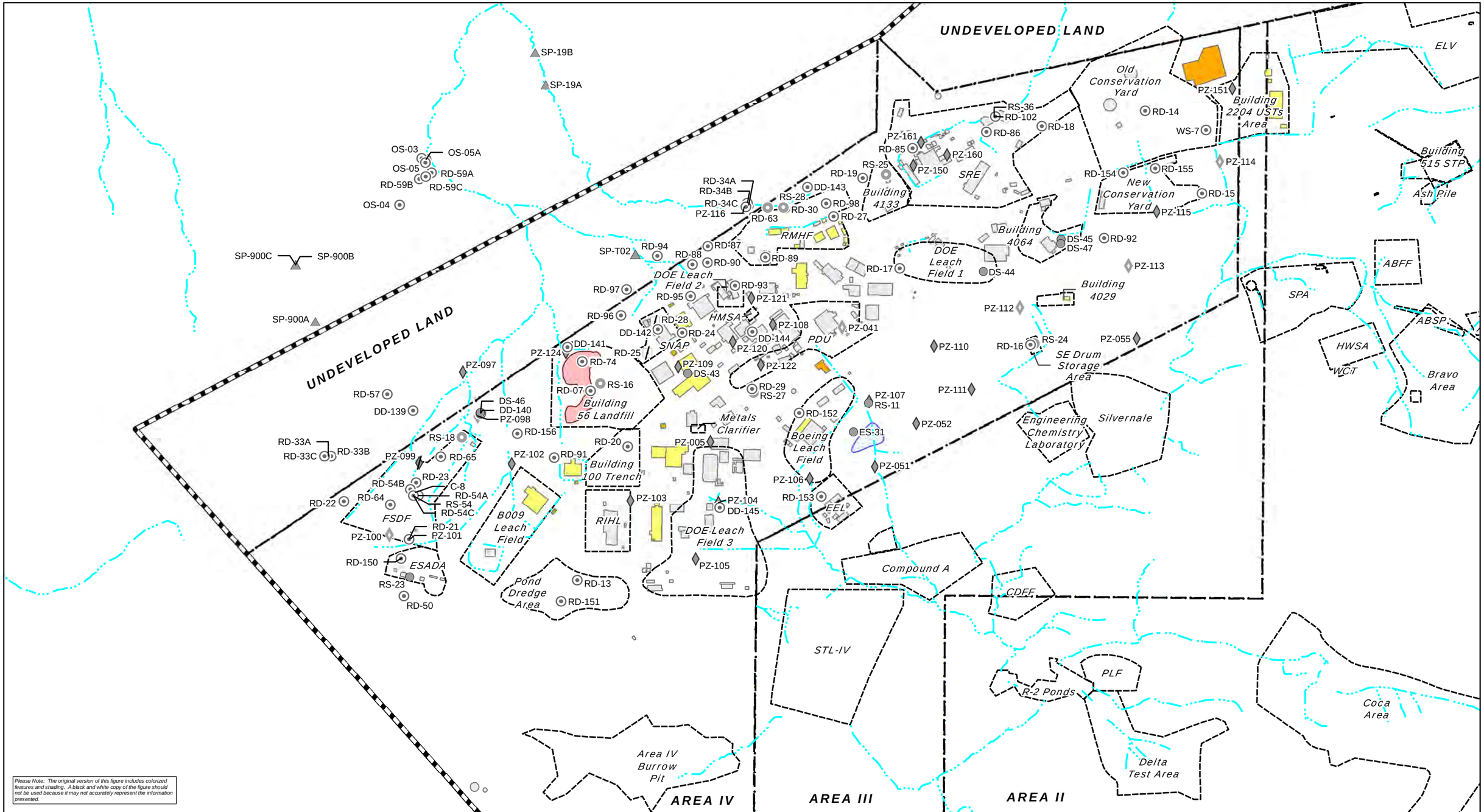
Fault
Lot Bed
Shale
Alluvium
Area IV Boundary
SSFL Property Boundary

Notes:
- Original GIS layers provided by MWH/Boeing; updated by CDM Smith as needed.
- Geologic data provided by Boeing, March 2018.
- Topo Source: Copyright:© 2013 National Geographic Society, i-cubed

N

0 350 700 Feet

FIGURE 2
Area IV Geologic Map



Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Legend

Well Type and Groundwater Zone

Groundwater Monitoring Wells

- Groundwater Monitoring Well, Perched
- Groundwater Monitoring Well, Near Surface
- Groundwater Monitoring Well, Chatsworth Formation

Piezometers

- Piezometer, Perched
- Piezometer, Near Surface

Seeps/Springs

- Seep/spring

Other

- Abandoned Well
- Abandoned Piezometer
- Corehole

Basemap

- Drainage
- RI Site Boundary
- Area IV Boundary
- SSFL Property Boundary

Structures

- Existing Landfill
- Existing Structure
- Existing Substation
- Former Pond
- Demolished Structure

Notes:
Original GIS layers provided by MWH/Boeing; updated by CDM Smith as needed.

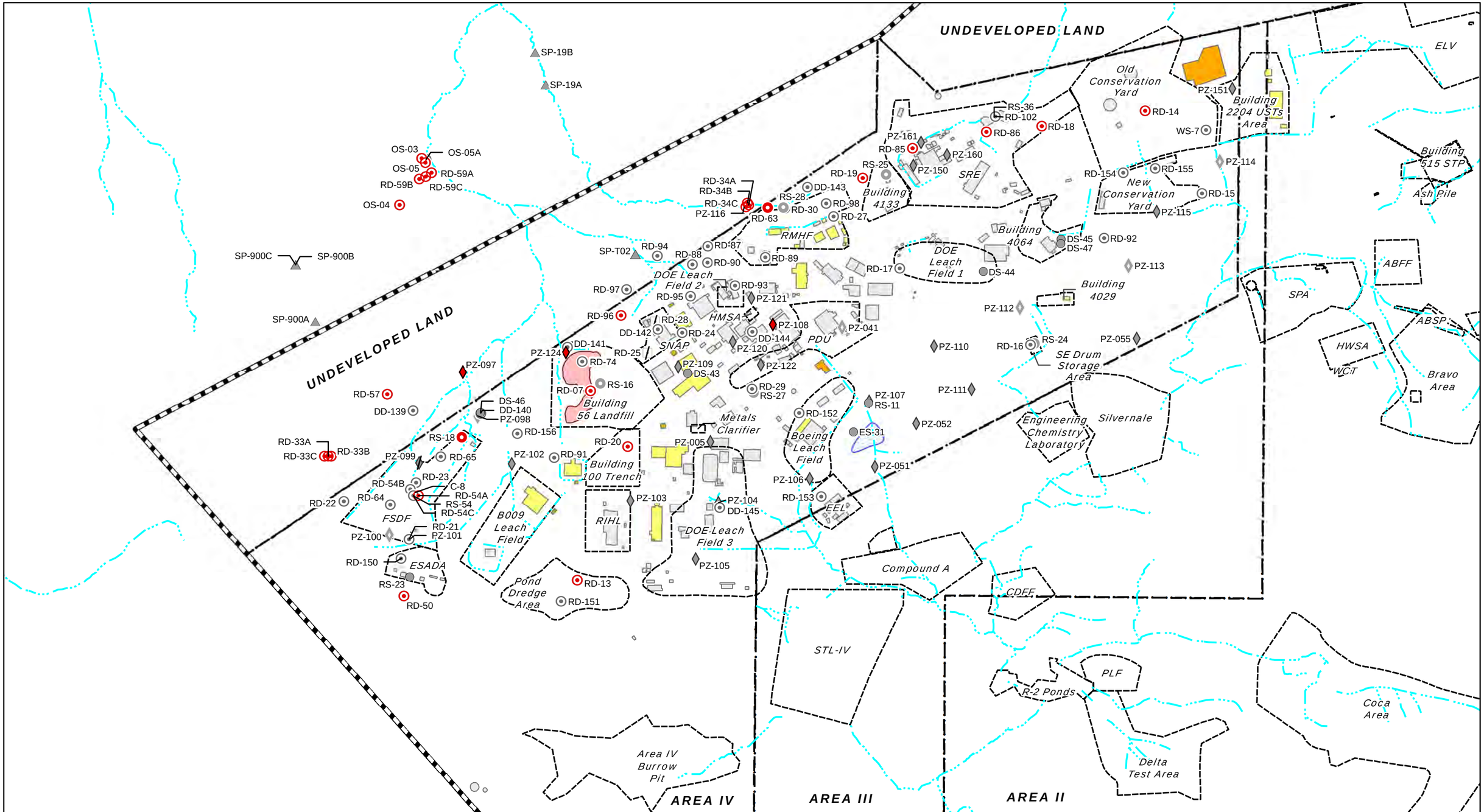
1 inch = 550 feet

0 275 550 825 1,100 Feet

NORTHWIND INC.

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
AREA IV
LOCATION OF WELLS, PIEZOMETERS, AND SEEPS
FIGURE 3

Y:\ETEC\Project\SSFL Annual Groundwater Report\2017\Fig 3_SSFL_2017GWAnnual_Well_PZ_Seep_Locs_11x17_20180130.mxd



Legend

Symbol Color for Site-wide and LUFT Program Monitoring Locations

- Site-wide Program

Well Type and Groundwater Zone

Groundwater Monitoring Wells

- Groundwater Monitoring Well, Perched
- Groundwater Monitoring Well, Near Surface
- Groundwater Monitoring Well, Chatsworth Formation

Piezometers

- Piezometer, Perched
- Piezometer, Near Surface

Seeps/Springs

- Seep/spring

Other

- Abandoned Well
- Abandoned Piezometer
- Corehole

Basemap

- Drainage
- RI Site Boundary
- Area IV Boundary
- SSFL Property Boundary

Structures

- Existing Landfill
- Existing Structure
- Existing Substation
- Former Pond
- Demolished Structure

Notes:
Original GIS layers provided by MWH/Boeing; updated by CDM Smith as needed.

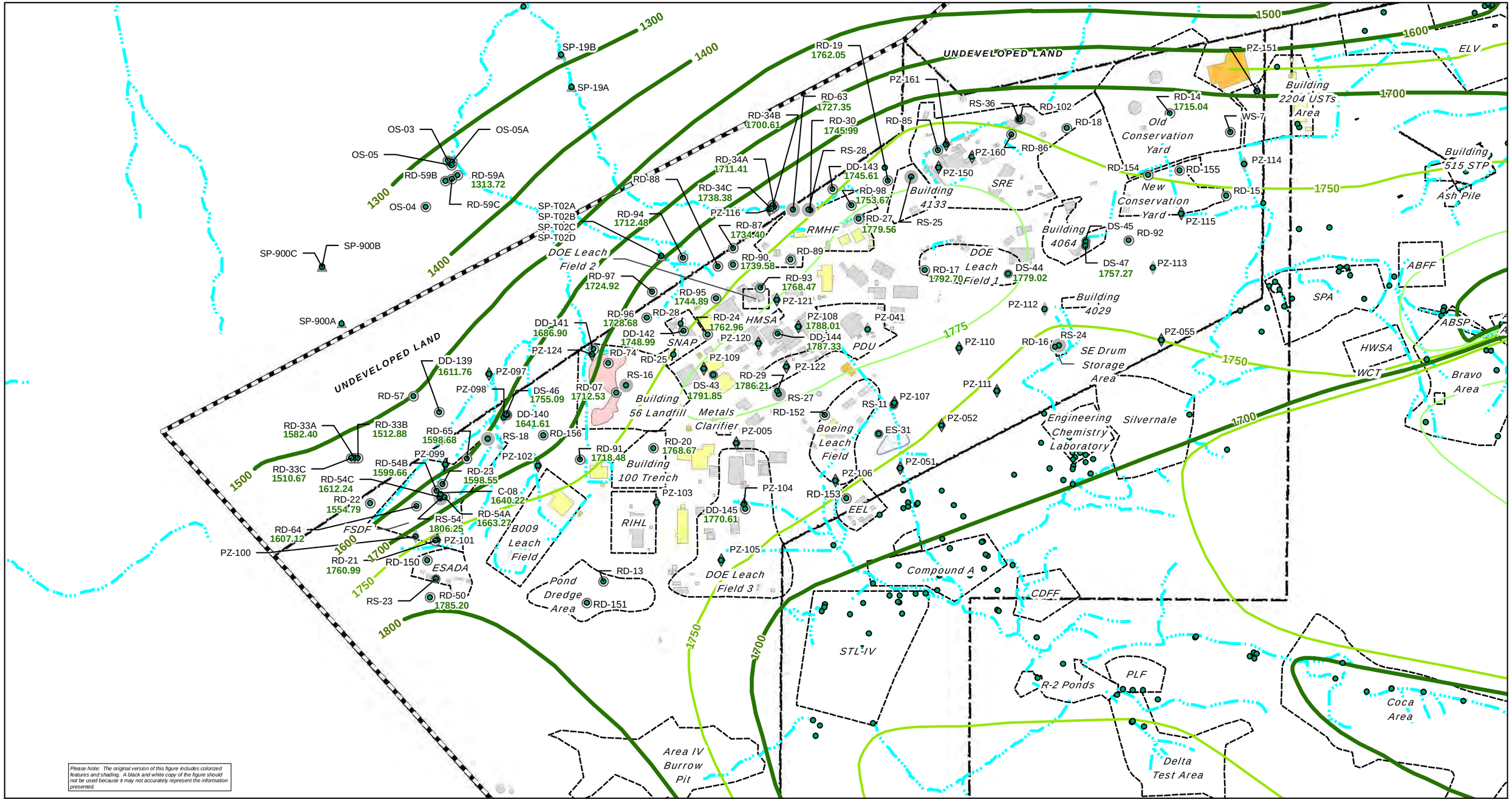
1 inch = 550 feet

0 275 550 825 1,100 Feet

NORTHWIND INC.

SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
AREA IV
SITE-WIDE PROGRAM MONITORING LOCATIONS
FIGURE 4

Y:\ETEC\Project\SSFL Annual Groundwater Report\2017\Fig 4_SSFL_2017GWAnnual_SWP_MW_Locs_11x17_2018130.mxd



Please Note: The original version of this figure includes colorized features and shading. A black and white copy of the figure should not be used because it may not accurately represent the information presented.

Legend

Well Type and Groundwater Zone

Groundwater Monitoring Wells

- Groundwater Monitoring Well, Perched
- Groundwater Monitoring Well, Near Surface
- Groundwater Monitoring Well, Chatsworth Formation

Piezometers

- Piezometer, Perched
- Piezometer, Near Surface

Seeps/Springs

- Seep/spring

Other

- Abandoned Well
- Abandoned Piezometer
- Corehole

Basemap

- Drainage
- RI Site Boundary
- Area IV Boundary
- SSFL Property Boundary

Structures

- Existing Landfill
- Existing Structure
- Existing Substation
- Former Pond
- Demolished Structure

Approximate Groundwater Elevation Contours (feet above sea level)

- 25
- 50
- 100
- 1771.65 Groundwater Level Elevation in feet above mean sea level

Notes:
GIS layers provided by MWH/Boeing.
Information used to develop the groundwater elevation contours includes topography; the approximate elevations of identified seeps and springs; water levels measured in seep piezometers gauged during 2017; historical water level data for wells and piezometers not gauged during the firstquarter of 2018; and the recognition that groundwater level discontinuities coincide with certain fault segments and other geologic structures.

1 inch = 550 feet

0 275 550 825 1,100 Feet

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SANTA SUSANA FIELD LABORATORY
VENTURA COUNTY, CALIFORNIA
AREA IV
GROUNDWATER ELEVATION CONTOUR MAP, 1st Quarter 2018
FIGURE 5

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Appendix A
Quality Assurance Assessment

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Background

The following summarizes the inorganic, metals, organic, and radiochemical data validation completed for 14 United States Environmental Protection Agency (EPA) Level IV data packages containing results from the Santa Susana Field Laboratory (SSFL) Area IV in Ventura County, California. The data for this effort were acquired from sampling efforts completed from February 19, 2018, through March 02, 2018. All of the data for this summary were generated by Test America Laboratories.

The data were validated using the requirements and protocols outlined in the following documents and analytical methods:

- *Statement of Work Data Validation Services Santa Susana Field Laboratory Area IV, Ventura County, California.*
- *Report on Annual Groundwater Monitoring, 2009 Susana Field Laboratory, Simi Hills, Ventura County, California.*
    - *Haley & Aldrich, 2010a, Appendix A, Site-Wide Water Quality Sampling and Analysis Plan, Revision 1, Santa Susana Field Laboratory, Ventura County, California,* December.
    - *Haley & Aldrich, 2010b, Appendix B, Groundwater Monitoring, Quality Assurance Project Plan, Revision 1, Santa Susana Field Laboratory, Ventura County, California,* December.
- U.S. EPA, 2017, *U.S. EPA National Functional Guidelines for Organic Superfund Methods Data Review,* OLEM 9355.0-136 EPA-540-R-2017-002, January.
- U.S. EPA, 2017, *U.S. EPA National Functional Guidelines for Inorganic Superfund Methods Data Review,* OLEM 9355.0-135 EPA-540-R-2017-001, January.
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA publication SW-846, Third Edition, Final Updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), and V (2015).
- *Multi Agency Radiological Laboratory Analytical Protocols, MARLAP, Manual*, EPA 402-B-04-001A, July 2004.
- *Evaluation of Radiochemical Data Usability, ES/ER-MS-5,* April 1997.

The following provides an overview of the data set and findings of the data package validation effort.

Summary

The SSFL data set consists of 14 EPA Level IV sample delivery groups (SDGs) with a total of 77 water samples. SDGs 160-26903-1, 160-27060-1, 280-106860-1, and 280-106978-1 underwent a Level IV EPA validation and comprised more than 20% of the overall data per an analysis for this sampling effort. The remaining SDGs underwent an EPA Level III validation.

Table A-1 shows the number and type of samples collected for the SSFL Energy Technology Engineering Center (ETEC) groundwater 2018 sampling effort. Attachment 1 is a comprehensive sample ID table compiled from the provided chain-of-custody forms.

Table A-1. Samples collected for SSFL ETEC groundwater sampling, 2018.

Sample Type	Number of Samples
Field Samples	40 Samples (16 were designated on the chain-of-custody forms as MS/MSD)
Trip Blanks	8 Samples
Rinsates	14 Samples
Field Blank	1 Sample
Field Duplicates	14 Samples

The samples were analyzed for volatile organic compounds (VOCs), 1,4-dioxane, 1,2,3-trichloropropane, gasoline-range organics (GRO), diesel-range organics (DRO), dissolved and total metals including mercury, perchlorate, nitrate, fluoride, and radiochemical (RAD) analyses (tritium and total/dissolved for the remaining RAD analyses). Table A-2 shows the requested analyses, analytical methods, and number of samples analyzed for each analysis compiled from the chain-of-custody forms.

Table A-2. Summary of analyses for SSFL ETEC groundwater sampling, 2018.

Analysis	Method		Number of Samples Analyzed
Volatile Organic Compounds (VOCs)	USEPA SW-846 Method 8260B		65
1,4-Dioxane	USEPA SW-846 Method 8260B Selective Ion Monitoring (SIM)		13
1,2,3-Trichloropropane	EPA Method 524.2 SIM		4
Gasoline-Range Organics	USEPA SW-846 Method 8015B		22
Diesel-Range Organics	USEPA SW-846 Method 8015B		16
Perchlorate	USEPA SW-846 Method 6860		16
Nitrate as N	EPA Method 300.0		7
Fluoride	EPA Method 300.0		11
Metals (Total & Dissolved)	USEPA SW-846 Method 6010C USEPA SW-846 Method 6020A USEPA SW-846 Method 7470A		47 Total Metals 47 Dissolved Metals
Radiochemical Analyses (Total & Dissolved)	Isotopic U	Method A-01-R U	32 Total Isotopic U 32 Dissolved Isotopic U
	Gamma Spectroscopy	EPA Method 900.1	32 Total Gamma Spectroscopy 32 Dissolved Gamma Spectroscopy
	Gross Alpha/Beta	EPA Method 900.0	33 Total Gross Alpha/Gross Beta 33 Dissolved Gross Alpha/Beta
	Strontium-90 (Sr-90)	EPA Method 905.0	32 Total Sr-90 32 Dissolved Sr-90
	Tritium	EPA Method 906.0	11 Tritium
	Radium-226 (Ra-226)	EPA Method 903.0	32 Total Ra-226 32 Dissolved Ra-226
	Radium-228 (Ra-228)	EPA Method 904.0	32 Total Ra-228 32 Dissolved Ra-228

Data Quality Summary

Anions (Fluoride and Nitrate as N) by EPA Method 300.0:

The SSFL anions data set consists of 7 water samples analyzed for nitrate as N and 11 water samples analyzed for fluoride, which resulted in 18 data points. All 18 data points are considered usable for evaluating site conditions and indicated that:

- 6 data points for nitrate as N and 7 data points for fluoride (13 data points, 72.2% of the total) were either non-detect and identified as "U" or were evaluated and remain unqualified. These results can be considered qualitative data.
- 4 fluoride and 1 nitrate data points (5 data points, 27.8% of the total) were qualified with a "J" validation flag and can be considered as quantitative data.

Perchlorate by USEPA SW-846 Method 6860:

The SSFL perchlorate data set consists of 16 water samples. All 16 data points are considered usable for evaluating site conditions and indicated that:

- 13 perchlorate data points (81.3% of the total) were either non-detect and identified as "U" or were evaluated and remain unqualified. These results can be considered qualitative data.
- 3 perchlorate data points (18.7% of the total) were qualified with a "J" or "J-"validation flag and can be considered quantitative data.

Total and Dissolved Metals by USEPA SW-846 Methods 6010C, 6020A, and 7470A:

The SSFL metals data set consists of 47 water samples analyzed for total metals and dissolved metals and resulted in 2,538 data points. All 2,538 data points are considered usable for evaluating site conditions and indicated that:

- 2,092 total and dissolved metals data points (82.4% of the total) were either qualified with a "U" validation flag due to blank detections, were non-detect, or were detected in the samples and can be considered as qualitative data.
- 446 total and dissolved metals data points (17.6% of the total) were qualified with a "UJ", "J+", "J-", or "J" validation flag and can be considered as quantitative data.

Gasoline-Range Organics (GRO) and Diesel-Range Organics (DRO) by USEPA SW-846 Method 8015B:

The SSFL GRO and DRO data set consists of 22 GRO samples and 16 DRO samples, which resulted in 38 data points. All 38 data points are considered usable for evaluating site conditions and indicated that:

- 17 GRO data points and 6 DRO data points (60.5% of the total) were either non-detect and identified as "U" or were evaluated and remain unqualified. These results can be considered as qualitative data.
- 10 DRO and 5 GRO data points (39.5% of the total) were qualified with a "J" or "UJ" validation flag and can be considered as quantitative data.

1,4-Dioxane by USEPA SW-846 Method 8260B SIM and 1,2,3-Trichloropropane by EPA Method 524.2:

The SSFL 1,4-dioxane data set consists of 13 water samples and the 1,2,3-trichloropropane data set consists of 4 water samples. All 17 data points are considered usable for evaluating site conditions and indicated that:

- 4 data points for 1,2,3-trichloropropane (100% of the total) were non-detect and can be considered as qualitative data.
- 4 data points for 1,4-dioxane results (30.8% of the total) were either non-detect and identified as "U" or were evaluated and remain unqualified. These results can be considered as qualitative data.
- 9 data points for 1,4-dioxane results (69.2% of the total) were qualified with a "J" or "UJ" and can be considered as quantitative data.

Volatile Organic Compounds by USEPA SW-846 Method 8260B:

The SSFL VOC data set consists of 65 water samples, which resulted in 1,365 data points. All 1,365 data points are considered usable for evaluating site conditions and indicated that:

- 1,295 data points (94.9% of the total) were non-detect, qualified "U" due to method, trip, or field blank detections, or were detections above the quantitation limit and can be considered qualitative data.
- 70 data points (5.1% of the total) were qualified "UJ" or "J" and can be considered quantitative data.

Radiochemical Analyses:

The SSFL radiochemical data set consists of 32 samples for total and dissolved isotopic uranium and strontium-90 (Sr-90), 32 samples for total and dissolved gamma spectroscopy, 33 samples for total and dissolved gross alpha/gross beta, 32 samples for total and dissolved strontium-90 (Sr-90), 11 samples for tritium, and 32 samples for total and dissolved radium-226 (Ra-226) and radium-228 (Ra-228), which resulted in 1,439 data points. All 1,439 data points are considered usable for evaluating site conditions and indicated that:

- 1,416 data points (98.4% of the total) were statistical non-detects or were considered as truly present in the samples and can be considered qualitative data.
- 23 data points (1.6% of the total) were qualified with a "UJ" or "J" validation flag and can be considered as quantitative data.

Trip Blanks and Field Blanks:

Eight trip blank samples and one field blank sample were collected for the SSFL ETEC groundwater 2018 sampling effort and are listed in Table A-3.

Table A-3. Trip/field blanks for SSFL ETEC groundwater sampling, 2018.

Sample Delivery Group (SDG)	Sample ID	Analysis	Quality Control (QC) Type
280-106660-1	DD-139_022218_78_L	VOC	Trip Blank
280-106726-1	DD-144_022218_78_L	VOC	Trip Blank
280-106848-1	DS-46_022718_78_L	VOC, 1,4-Dioxane, GRO	Trip Blank
280-106589-1	PZ-108_021918_78_L	VOC and GRO	Trip Blank
280-106810-1	PZ-120_022618_78_L	VOC and 1,4 Dioxane	Trip Blank
280-106620-1	RD-33B_022018_78_L	VOC and GRO	Trip Blank
280-106976-1	RD-34B_030118_78_L	VOC, GRP, 1,4-Dioxane,and 1,2,3-Trichloropropane	Trip Blank
	RD-34B_030118_19_L	VOC, Metals, Perchlorate, GRO, DRO, RAD Analyses, Anions, 1,4-Dioxane, 1,2,3-Trichloropropane, & Tritium	Field Blank
280-106860-1	RD-98_022818_78_L	VOC and GRO	Trip Blank

The following compounds were detected in the trip blank and field blank samples:

- GRO in samples RD-34B_030118_78_L, RD-33B_022018_78_L, DS-46_022718_78_L, and RD-98_022818_78_L.
- Acetone, U-2333/234, total and dissolved boron, total and dissolved calcium, and total strontium in RD-34B_030118_19_L.

No data qualification has been warranted based on these detections.

Field Duplicates:

Fourteen pairs of field duplicates were collected during the SSFL ETEC groundwater 2018 sampling effort and are listed in the following table.

Table A-4. Field duplicates for SSFL ETEC groundwater sampling, 2018.

SDG#	Parent ID	Field Duplicate ID	Analysis
280-106589-1	DD-145_021918_01_L	DD-145_021918_36_L	GRO
	RD-20_022018_01_L	RD-20_022018_36_L	Nitrate
160-26984-1	DS-47_022318_01_L	DS-47_022318_36_L	Rad Suite
	RD-90_022218_01_L	RD-90_022218_36_L	Tritium
160-27060-1 (RAD) 280-106860-1 (VOCs)	RD-59C_022818_01_L	RD-59C_022818_36_L	RAD Analyses and VOC
280-106620-1	RD-33B_022018_01_L	RD-33B_022018_36_L	Perchlorate
	RD-63_022118_01_L	RD-63_022118_36_L	VOC and GRO
	RD-96_022118_01_L	RD-96_022118_36_L	Metals and DRO
280-106660-1	DD-139_022218_01_L	DD-139_022218_36_L	VOC

SDG#	Parent ID	Field Duplicate ID	Analysis
280-106810-1	DD-143_022618_01_L	DD-143_022618_36_L	Metals
280-106848-1	DD-140_022718_01_L	DD-140_022718_36_L	VOC
280-106860-1	RD-59B_022818_01_L	RD-59B_022818_36_L	Metals and Fluoride
280-106976-1	RD-14_030218_01_L	RD-14_030218_36_L	1,2,3-Trichloropropane
	RD-34A_030218_01_L	RD-34A_030218_36_L	1,4-Dioxane

The field duplicate precision for perchlorate (42.8% relative percent difference, RPD) in field duplicate pair RD-33B_022018_01_L/ RD-33B_022018_36_L exceeded the 35% RPD criterion. The remaining field duplicate precision criteria were met.

Data Validation Qualifications

Qualifications were assigned in accordance with the *U.S. EPA Contract Laboratory Program National Functional Guidelines* and resulted from preparation and chain-of-custody issues; poor initial and continuing calibration criteria; positive blank detections; poor laboratory control sample (LCS), laboratory control sample duplicate (LCSD), matrix spike (MS), matrix spike duplicate (MSD), and serial dilution sample (SDS) performance; and results reported below the quantitation limits. Table A-5 summarizes the findings and data qualifications assigned to SSFL ETEC Groundwater 2018 data results. Please refer to Attachment B for definitions of the data validation qualifiers.

Table A-5. Summary of data validation qualifications for SSFL ETEC groundwater sampling, 2018.

Analyte	**Total # of**	**Analyte**	**Total # of**
Nitrate as N	7	6	"U" or No Qualification
		1	**J**
Fluoride	11	7	"U" or No Qualification
		4	**J**
Perchlorate	16	13	"U" or No Qualification
		1	**J-**
		2	**J**
Metals	2538	2092	"U" or No Qualification
		13	**UJ**
		23	**J+**
		1	**J-**
		409	**J**
GRO	22	17	"U" or No Qualification
		4	**J**
		1	**UJ**
DRO	16	6	"U" or No Qualification
		10	**J**
1,2,3-Trichloropropane	4	4	"U"
1,4-Dioxane	13	4	"U" or No Qualification
		5	**UJ**
		4	**J**
VOCs	1365	1295	"U" or No Qualification
		38	**UJ**
		32	**J**
Radiochemical Data (including Tritium)	1439	1416	"U" or Positively Detected in the Sample
		18	**UJ**
		5	**J**

Data Review Process

Data produced by the analytical laboratories were subject to multiple review steps to coincide with the start of distinct tasks. These steps were performed in a timely manner to ensure appropriate feedback and correction of errors. These steps included:

- Cross-reference check of sample chain-of-custody documents against the laboratory acknowledgement of sample receipt form. The laboratory acknowledgement of sample receipt was typically transmitted to the data manager via e-mail 2 to 3 days after sample receipt and log-in and included a summary of the requested analyses to be performed per sample. Sample log-in errors were identified and corrected at this step.

- Tracking of sample collection, receipt, and laboratory SDG numbers on a sample tracking spreadsheet. This spreadsheet also included field QC sample information and well sample location coordinates.

- Laboratory consultation with the project chemists on data quality issues during sample analyses such as missed holding times, poor spike recoveries, etc. These issues were discussed between the project chemists and the laboratory and were resolved based on technical merit and determined if usable in the evaluation.

Upon receipt of the laboratory report (delivered via e-mail), a preliminary review of the data was performed. This review consisted of:

- Reconciliation of the reported analyses against the analyses that were requested on the chain-of-custody documents.

- Review of the laboratory case narratives. The case narrative identified and explained quality issues encountered during the analysis of the samples. Quality issues may include (but not be limited to) expired holding times, poor spike recoveries in matrix or batch-specific QC samples, instrument calibration exceedances, and blank contamination.

- Review of the laboratory-specific QC data. These data were provided by the laboratory in summary form. Any unanticipated deviations from the project or method-specific criteria were reconciled with the laboratory at this stage.

Data Quality Indicators

This section summarizes the validation performed. Individual SDG validation reports with specific sample details are provided in Attachment 2.

Achievement of the Data Quality Objectives (DQOs) was determined in part by the use of Data Quality Indicators (DQIs). The DQIs for measurement data are expressed in terms of what are collectively referred to as the PARCCS parameters (Precision, Accuracy, Representativeness, Comparability, Completeness, and Sensitivity). The DQIs provide a mechanism for ongoing control to evaluate and measure data quality throughout the project. These criteria are defined in the sections below.

Precision

Precision is the measurement of the ability to obtain the same value on re-analysis of a sample through the entire analytical process. The closer the measurement results, the greater the precision. Precision has

nothing to do with accuracy or true values of the sample. Instead, it is focused on random errors inherent in the analysis that stem from the measurement process and are compounded by the non-homogeneous nature of some samples. Precision is measured by analyzing two portions of the sample (sample and duplicate) and then comparing the results. This comparison can be expressed in terms of relative percent difference (RPD). RPD is calculated as the absolute difference between the two measurements divided by the average of the two measurements.

$$\mathbf{RPD = [(A-B)/\frac{A+B}{2}] \times 100}$$

A condition with this formula is that it depends on the average of the two measurements, and the magnitude of the calculated RPD is intimately linked to the magnitude of the results. When sample results are close to the reporting limit (RL), the RPD is greater but does not necessarily indicate that the precision is out of control limits, just that the sample concentrations are low.

RPD as a measure of precision works very well in those cases where the same level of analyte is present in all samples; however, it does not work well as a quantitative tool when varying levels are present. Another option that is used for evaluating the differences between sample results that are close to the RL is calculating the absolute difference between the results. In this situation, the difference between the sample results is compared to the RL and if the difference is greater, the sample results are qualified as estimated "J/UJ." Sample results are also qualified as estimated “J/UJ” if the RPD is outside of criteria.

Because of the limitations with the use of RPDs for field duplicate precision evaluation, precision is also calculated on spike samples, either on an MS and MSD or on an LCS/LCSD. For spike samples, a known concentration of analyte has been added to each sample and evaluations of RPD can be made that are more applicable to variations in environmental measurements. The drawback is that the precision measurement is applicable only to the particular spike level used.

For the groundwater samples, precision was evaluated by reviewing RPD results for MS/MSDs, LCS/LCSDs, laboratory duplicates, and field duplicates.

Laboratory RPD control limits are presented in the Water Quality Sampling and Analysis Plan (WQSAP) (Haley & Aldrich 2010) or are laboratory specific. For laboratory duplicates, if one or both of the sample results were less than five times the RL, a control limit of the absolute difference value equal to the RL was used for comparison. The field duplicate RPD criterion is 35%.

Based on laboratory and/or field duplicate precision criteria during the validation process, qualifiers were applied to applicable sample results.

Accuracy

Accuracy is a concept from quantitative analysis that attempts to address the question of how close the analytical result is to the true value of the analyte in the sample. Accuracy is determined through a spike procedure, where a known amount of the target analyte is added to a portion of the sample and then the sample and the spiked sample are analyzed. The quantitative measure of accuracy is percent recovery (%R), calculated as follows:

$$\text{Percent Recovery} = \frac{(\text{Total Analyte Found} - \text{Analyte Originally Present})}{\text{Analyte Added}} \times 100$$

Each measurement performed on a sample is subject to random and systematic error. Accuracy is related to the systematic error. Attempts to assess systematic error are always complicated by the inherent random error of the measurement.

Analytical accuracy for the entire data collection activity is difficult to assess because several sources of error exist. Errors can be introduced by any of the following:

- Sampling procedure
- Field contamination
- Sample preservation and handling
- Sample matrix
- Sample preparation
- Analytical techniques.

Accuracy is maintained to the extent possible by adhering to the EPA method and approved field and analytical standard operating procedures.

The following QC samples are used to assess laboratory accuracy:

- Matrix Spikes: These are samples with a known amount of a target analyte added to them. Analysis of the sample that has been spiked and comparison with the results from the unspiked sample (background) gives information about the ability of the test procedure to generate a correct result from the sample.
- Post-Digestion Spikes: Post-digestion spikes are performed after the sample has been prepared and is ready for analysis. These are also termed "analytical spikes." The technique is used in conjunction with an MS to provide data that can separate interferences produced as part of the sample preparation from interferences that are innate qualities of the sample.
- Laboratory Control Samples: LCSs consist of a portion of analyte-free water spiked with target analytes at a known concentration.
- Surrogates: Surrogate recovery is a QC measure limited to use in organics analysis. Surrogates are compounds added to every sample at the beginning of the sample preparation to monitor the success of the sample preparation and analytical procedures on an individual sample basis. Individual compounds used as surrogates are selected based on their ability to mimic the behavior of specific target analytes held to be particularly sensitive to the sample preparation manipulations.
- Interference Check Samples: Interference check sample analysis is a QC measure unique to metals analysis using inductively coupled plasma atomic emission spectrometry. This QC sample verifies the analytical instrument's ability to overcome interferences typical of those found in samples.
- Calibrations: Method requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable quantitative data for metals. Initial calibration

demonstrates that the instrument is capable of acceptable performance at the beginning of the analytical run. Continuing calibrations demonstrate that the initial calibration is still valid by checking the performance of the instrument on a continuing basis.

- Internal Standards: Internal standards measure the gas chromatograph/ mass spectrometer sensitivity and response stability during each analysis.

- Serial Dilution: Serial dilutions are performed on at least one sample from every batch of analyses for metals to determine if physical or chemical interferences exist in the analyte determinations.

For the groundwater samples, accuracy was evaluated by reviewing the %R values and relative response factors of initial and continuing calibration (percent difference or percent drift [%D] for organic analyses), the initial and continuing calibration recoveries for inorganic analyses, internal standards, surrogate spikes (organic analyses only), MS/MSD, LCS/LCSD, inductively coupled plasma (ICP) interferences, and by performing serial dilution checks during metals analyses, in conjunction with method blank, calibration blank, equipment rinsate blank, and trip blank results. These QC results assist in identifying the type and magnitude of effects that may have contributed to system error introduced from field and/or laboratory procedures.

Qualifiers were applied to applicable sample results during the validation process based on laboratory accuracy results. Results were qualified based on calibrations, surrogates, internal standards, ICP serial dilutions, LCS/LCSD recoveries, and MS/MSD recoveries.

Sample preservation, handling, and holding times are additional measures of accuracy of the data. Holding times are defined as the amount of time that elapses from collection of the sample in the field to the start of the analysis. Preservation is defined as techniques used to maintain the target analytes at concentrations representative of the source sampled.

In summary, sample results that have been qualified as estimated "J, J+, J-, or UJ" due to accuracy criteria are usable for project decisions. No sample results were rejected.

Blank Contamination

Blanks are used to determine the level of laboratory and field contamination introduced into the samples, independent of the level of target analytes found in the sample source. Sources of sample contamination can include the containers and equipment used to collect the sample; preservatives added to the sample; cross contamination from other samples in transport coolers and laboratory sample storage refrigerators; standards used to calibrate instruments; glassware and reagents used to prepare samples for analysis; airborne contamination in the laboratory preparation area; and the analytical instrument sample introduction equipment. Each analyte group has its own particular suite of common laboratory contaminants. Active measures must be performed to continually measure the ambient contamination level and steps taken to discover the source of the contamination and to eliminate or minimize the levels. Random spot contamination can also occur from analytes that are not common laboratory problems but that can arise as a problem for a specific project or over a short period of time. Field blanks, equipment blanks, trip blanks, and laboratory method blanks are analyzed to identify possible sources of contamination.

The data validation reports discuss the specific results that were qualified as non-detect “U” based on field and laboratory blank contamination.

Representativeness, Comparability, and Sensitivity

Representativeness, comparability, and sensitivity are achieved by using EPA-approved sampling procedures and analytical methodologies. By following the procedures described in the WQSAP and Appendix B (Haley & Aldrich 2010a, 2010b) for this sampling event and future sampling events, sample analysis should yield results representative of environmental conditions at the time of sampling. Similarly, reasonable comparability of analytical results for this and future sampling events can be achieved if approved EPA analytical methods and standardized reporting units are employed.

Representativeness

Representativeness is a qualitative term that expresses the degree to which the sample data accurately and precisely represent the environmental conditions corresponding to the location and depth interval of sample collection. Requirements and procedures for sample collection are designed to maximize sample representativeness.

Representativeness also can be monitored by reviewing field documentation and/or performing field audits. For this report, a detailed review was performed on the chain-of-custody forms, laboratory sample confirmation logs, and data validation packages.

The most significant measure of representativeness is the accuracy of the sampling network and selection of appropriate locations and depths, etc. Field sampling accuracy was attained through adherence to the approved WQSAP and Appendix B (Haley & Aldrich 2010a, 2010b) for sample location and collection and by using approved standard operating procedures for field data collection. The data should represent, as near as possible, the actual field conditions at the time of sampling.

Representativeness has been achieved by the performed field work and laboratory analyses. The analytical data generated are viewed to be a representative characterization of the project area. No sample results were rejected.

Comparability

Comparability is a qualitative term that expresses the confidence with which a data set can be compared with another. Strict adherence to standard sample collection procedures, analytical detection limits, reporting units, and analytical methods assures that data from like samples and sample conditions are comparable. This comparability is independent of laboratory personnel, data reviewers, or sampling personnel. Comparability criteria are met for the project if, based on data review, the sample collection and analytical procedures are determined to have been followed, or defined to show that variations did not affect the values reported.

To ensure comparability of data generated for the site, standard sample collection procedures were utilized by North Wind. Department of Toxic Substances Control (DTSC)-approved analytical methods were performed by Test America Laboratories. Similar methods and concentration levels to those used for previous sampling events also allow for comparable data. Utilizing such procedures and methods enables the current data to be comparable with previous and future data sets generated.

Sensitivity

Sensitivity is related to the ability to compare analytical results with project-specific levels of interest, such as risk-based screening levels or action levels. Analytical detection limits for the various sample analytes should be below the level of interest to allow an effective comparison.

Detection Limits

The method detection limit (MDL) study attempts to answer the question, "What is the lowest level of analyte in a sample that will result in a signal different than zero?" The study is based upon repetitive analysis of an interference-free sample spiked with a known amount of the target analyte. The MDL is a measure of the ability of the test procedure to generate a positive response for the target analyte in the absence of any other interferences from the sample.

The RL is generally defined as the lowest concentration at which an analyte can be detected in a sample and its concentration reported with a reasonable degree of accuracy and precision. For samples that do not pose a particular matrix problem, the RL is typically about three to five times higher than the MDL.

Laboratory results are reported according to rules that provide established certainty of detection and RLs. The result for an analyte is flagged with a "U" if that analyte was not detected, or qualified with a "J" flag if associated QC results fall outside the appropriate tolerance limits. Also, if an analyte is present at a concentration between the MDL and the RL, the analytical result is flagged with a "J," indicating an estimated quantity. Qualifying the result as an estimated concentration reflects increased uncertainty in the reported value.

Qualifiers were applied to applicable sample results by the laboratory and during the validation process based on sample results being reported as detected below the RL/MDL. Details of the validation and specific sample analytes qualified are discussed in the data validation reports.

In summary, for the collected groundwater samples, results for some of the analytes were qualified as estimated due to RL criteria. For the data validated in the 2018 groundwater sampling, RLs for a majority of the sample results were low enough to compare to the RL objectives stated in the WQSAP (Haley & Aldrich 2010a, 2010b). RLs above those stated in these documents are considered usable for project purposes.

Data Completeness

Completeness of the data collection program is defined as the percentage of samples planned for collection as listed in the WQSAP and Appendix B (Haley & Aldrich 2010a, 2010b) versus the actual number of samples collected during the field program (see Equation A).

Completeness for acceptable data is defined as the percentage of acceptable data obtained judged to be valid versus the total quantity of data generated (see Equation B). Acceptable data include both data that pass all the QC criteria (unqualified data) and data that may not pass all the QC criteria but had appropriate corrective actions taken (qualified but usable data).

Equation A.

$$\%\text{Completeness} = C_x \frac{100}{n}$$

Where:

C = actual number of samples collected
n = total number of samples planned

Equation B.

$$\%\text{Completeness} = V_x \frac{100}{n'}$$

Where:

V = number of measurements judged valid
n' = total number of measurements made

The overall completeness goal, as defined in the WQSAP and Appendix B (Haley & Aldrich 2010a, 2010b), for this sampling event is 90% for each analytical test for all project data.

The completeness goal achieved for acceptable data was 100% of the groundwater sample results for the number of measurements judged to be valid versus the total number of measurements made for all samples analyzed. No sample results were rejected. The completeness goal for the number of measurements judged to be valid was met for 2018 groundwater monitoring sampling. The data reported and not rejected are suitable for their intended use for characterization of groundwater in Area IV of SSFL.

Assessment of Data Usability and Reconciliation with the Site-Wide WQSAP Goals

One hundred percent of the data validated for the 2018 groundwater sampling, and reported in this quality assurance summary, are suitable for their intended use for site characterization. No sample results were rejected.

The RLs reported generally met the expected limits proposed by the analytical laboratories in their subcontract agreements with North Wind except for the analytes identified previously. Sample results that were qualified as estimated are usable for project decisions. The field duplicate precision criteria were met. Decisions based on results close to the RL should be made with a degree of caution.

The achievement of the completeness goal for the number of samples collected was met. The completeness goal for the number of sample results acceptable for use provides sufficient quality data to support project decisions for the wells that were sampled during this sampling event.

Attachment A

SDG and Field Sample ID Table

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SDG	Well or Piezometer ID	Sample	Analyses	QC
160-26868-1	PZ-105	PZ-105_021918_01_L	N	
	DD-145	DD-145_021918_01_L	N	
	DD-145	DD-145_021918_19R_L	N	Rinsate
	C-8	C-8_021918_19R_L	N	Rinsate
280-106589-1	TB	PZ-108_021918_78_L	V, G	Trip Blank
	PZ-108	PZ-108_021918_01_L	V, M	
	PZ-105	PZ-105_021918_01_L	V, M, G	
	DD-145	DD-145_021918_01_L	V, M, G	MS/MSD DRO
	DD-145	DD-145_021918_36_L	G	Field Duplicate
	RD-23	RD-23_021918_01_L	V	
	C-8	C-8_021918_01_L	V, M	
	RS	DD-145_021918_19R_L	V, M, G	Rinsate
	RS	C-8_021918_19R_L	V, M, G	Rinsate
	RD-21	RD-21_022018_01_L	V, P, M	MS/MSD VOCs
	RD-20	RD-20_022018_01_L	V, N	
	RD-20	RD-20_022018_36_L	N	Field Duplicate
280-106620-1	TB	RD-33B_022018_78_L	V, G	Trip Blank
	RD-33B	RD-33B_022018_01_L	V, P, M	
	RD-33B	RD-33B_022018_36_L	P	Field Duplicate
	RD-33C	RD-33C_022118_01_L	V, P, M, G	MS/MSD Perchlorate
	RD-63	RD-63_022118_01_L	V, G	
	RD-63	RD-63_022118_36_L	V, G	Field Duplicate
	RD-96	RD-96_022118_01_L	V, P, M, G	MS/MSD GRO
	RD-96	RD-96_022118_36_L	M, G	Field Duplicate
280-106660-1	TB	DD-139_022218_78_L	V	Trip Blank
	DD-139	DD-139_022218_01_L	V, P, M	
	DD-139	DD-139_022218_36_L	V	Field Duplicate
	DD-142	DD-142_022218_01_L	V, M	MS/MSD Metals
	PZ-109	PZ-109_022218_01_L	V	
	DD-144	DD-144_022218_01_L	V, M	
	DS-43	DS-43_022218_01_L	V, M	
280-106726-1	TB	DD-144_022218_78_L	V	Trip Blank
	RS	DD-144_022218_19R_L	V, P, M	Rinsate
	RS	DS-43_022218_19R_L	V, M	Rinsate
	DS-44	DS-44_022318_01_L	V, M	
	DS-47	DS-47_022318_01_L	V, M	
	RS	DS-44_022318_19R_L	V, M	Rinsate
	RS	DS-47_022318_19R_L	V, M	Rinsate

SDG	Well or Piezometer ID	Sample	Analyses	QC
280-106810-1	TB	PZ-120_022618_78_L	V, D	Trip Blank
	PZ-120	PZ-120_022618_01_L	V, M	
	RD-07	RD-07_022618_01_L	V, M	MS/MSD VOCs
	DD-143	DD-143_022618_01_L	V, M	
	DD-143	DD-143_022618_36_L	M	Field Duplicate
	RS	RD-07_022618_19R_L	V, M	Rinsate
	RS	DD-143_022618_19R_L	V, M	Rinsate
	RD-65	RD-65_022718_01_L	V, D	MS/MSD 1,4-Dioxane
280-106848-1	TB	DS-46_022718_78_L	G, D	Trip Blank
	DS-46	DS-46_022718_01_L	V, M, D	MS/MSD VOCs
	DD-140	DD-140_022718_01_L	V, M, D	MS/MSD Metals
	DD-140	DD-140_022718_36_L	V	Field Duplicate
	DD-141	DD-141_022718_01_L	V, P, M, G	MS/MSD GRO
	RD-29	RD-29_022718_01_L	V	
	RS	DD-141_022718_19R_L	V, P, M, G, D	Rinsate
	RS	RD-29_022718_19R_L	V, M	Rinsate
280-106860-1	TB	RD-98_022818_78_L	V, G	Trip Blank
	RD-98	RD-98_022818_01_L	V	
	RD-59B	RD-59B_022818_01_L	V, P, M, F	MS/MSD VOCs
	RD-59B	RD-59B_022818_36_L	M, F	Field Duplicate
	RD-59C	RD-59C_022818_01_L	V, P, M, F	MS/MSD Metals & Fluoride
	RD-59C	RD-59C_022818_36_L	V	Field Duplicate
	RD-59A	RD-59A_022818_01_L	V, P, M, F	
	RD-19	RD-19_022818_01_L	V, M, G, F	
	RS	RD-98_022818_19R_L	V	Rinsate
280-106873-1	FB	RD-34B_030118_19_L	G, P, M, N, F	Field Blank
280-106976-1	TB	RD-34B_030118_78_L	V, G, D, TCP	Trip Blank
	RD-33A	RD-33A_030118_01_L	V, M, P, F, D	
	RD-34B	RD-34B_030118_01_L	V, M,	
	FB	RD-34B_030118_19_L	V, G, D, TCP	Field Blank
	RS	RD-34B_030118_19R_L	V, M, F, D	Rinsate
	RD-54A	RD-54A_030118_01_L	V, P,M, G	
	RS	RD-54A_030118_19R_L	V, P, M, G	Rinsate
	RD-17	RD-17_030218_01_L	V, M	
	RS	RD-17_030218_19R_L	V, M	Rinsate
	RD-14	RD-14_030218_01_L	V, G, F, TCP	MS/MSD TCP
	RD-14	RD-14_030218_36_L	TCP	Field Duplicate

SDG	Well or Piezometer ID	Sample	Analyses	QC
	RD-34A	RD-34A_030218_01_L	V, M, G, F, D	
	RD-34A	RD-34A_030218_36_L	D	Field Duplicate*
	RD-34C	RD-34C_030218_01_L	V, M, F, D	
160-26903-1	RD-20	RD-20_022018_01_L	R, T	
	RD-33B	RD-33B_022018_01_L	R, T	
	RD-33C	RD-33C_022118_01_L	R, T	
	RD-63	RD-63_022118_01_L	R, T	
160-26984-1	RD-96	RD-96_022118_01_L	R	
	RD-95	RD-95_022218_01_L	T	MS/MSD Tritium
	RD-90	RD-90_022218_01_L	T	
	RD-90	RD-90_022218_36_L	T	Field Duplicate
	DD-144	DD-144_022218_01_L	T	
	RS	DD-144_022218_19R_L	T	Rinsate
	RS	DS-43_022218_19R_L	T	Rinsate
	DS-44	DS-44_022318_01_L	R	"MS/MSD RAD (Except 901.1)
	DS-47	DS-47_022318_01_L	R	
	DS-47	DS-47_022318_36_L	R	Field Duplicate
	RS	DS-47_022318_19R_L	R	Rinsate
	RS	DS-44_022318_19R_L	R	Rinsate
160-27060-1	PZ-120	PZ-120_022618_01_L	R	
	RD-07	RD-07_022618_01_L	R	
	DD-143	DD-143_022618_01_L	R	
	RS	RD-07_022618_19R_L	R	Rinsate
	RS	DD-143_022618_19R_L	R	Rinsate
	DD-141	DD-141_022718_01_L	R	
	RS	DD-141_022718_19R_L	R	Rinsate
	RD-59A	RD-59A_022818_01_L	R	
	RD-59C	RD-59C_022818_01_L	R	
	RD-59C	RD-59C_022818_36_L	R	Field Duplicate
	RD-59B	RD-59B_022818_01_L	R	MS/MSD RAD (Except 901.1)
	RD-19	RD-19_022818_01_L	R	
	RD-98	RD-98_022818_01_L	R	
	RS	RD-98_022818_19R_L	R	Rinsate
160-27088-1	RD-33A	RD-33A_030118_01_L	R	
	RD-34B	RD-34B_030118_01_L	R	

SDG	Well or Piezometer ID	Sample	Analyses	QC
	FB	RD-34B_030118_19_L	R, T	Field Blank
	RS	RD-34B_030118_19R_L	R	Rinsate
	RD-54A	RD-54A_030118_01_L	R	
	RS	RD-54A_030118_19R_L	R	Rinsate
	RD-14	RD-14_030218_01_L	R	
	RD-34A	RD-34A_030218_01_L	R	
	RD-34C	RD-34C_030218_01_L	R	

Note: Sample ID table compiled from the chain-of-custody forms
TB = trip blank
RS = rinsate
FB = field blank

T = tritium
V = volatile organic compounds (VOCs)
G = gasoline range organics (GRO) and/or diesel range organics (DRO)
M = metals, P = perchlorate
N = nitrate as N, F = fluoride
R = radiochemical analyses
D = 1,4-dioxane
TCP = 1,2,3-trichloropropane

Attachment B

Data Validation Qualifier Definitions

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Inorganic Data Validation Qualifiers

Flag	Definition
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

Organic Data Validation Qualifiers

Flag	Definition
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.
NJ	Presumptively present at an estimated quantity (use with Tentatively Identified Compounds (TICs) only). A TIC is a compound not specified on the Target Compound List (TCL). A mass spectral library search is used to identify the compound.

Radiochemical Data Validation Qualifiers

Flag	Definition
	The analysis was performed, and radioactivity was detected (e.g., the radioanalytical result is statistically positive at the 95% confidence interval and is above its MDC). **NOTE:** *The radionuclide is considered to be present in the sample.*
U	The analysis was performed, but no radioactivity was detected (i.e., the radioanalytical result was not statistically positive at the 95% confidence interval and/or the result was below its MDC). The "U" qualifier flag is also applicable to any result reported as zero (0) (± an associated uncertainty). **NOTE:** *The radionuclide is not considered to be present in the sample.*
UJ	The analysis was performed, but the result is highly questionable due to analytical and/or laboratory quality control anomalies. The use of such a result is strongly discouraged. Analytical and quality control anomalies include such items as: significant blank contamination, known photopeak interferences and/or photopeak resolution problems, known matrix interferences, unacceptable laboratory control sample recoveries, serious instrument calibration problems, improper sample preservation, etc. The "UJ" qualifier flag could designate a possible false positive result in the case of a result that is statistically positive at the 95% confidence level. The "UJ" qualifier flag could indicate the result is considered an estimated non-detect (a non-detect that may be due to loss of analyte from lack of sample preservation, holding time exceedances, etc.). The specific use of the "UJ" flag is included by the validator in the text of the validation report. **NOTE:** *The radionuclide may or may not be present in the sample and the result is considered highly questionable.*
J	The analysis was performed, and radioactivity was detected (i.e., the radionuclide result is statistically positive at the 95% confidence interval and is above its MDC). However, the result is questionable due to analytical and/or laboratory quality control anomalies/ irregularities and should therefore be used only as an estimated (approximated) quantity. Analytical and/or quality control anomalies include such items as: laboratory duplicate imprecision, unsatisfactory analytical yields, insufficient laboratory control sample recoveries, unacceptable PE sample results, instrument calibration problems, improper sample preservation, etc. **NOTE:** *The radionuclide is considered to be present in the sample; however, the result may not be an accurate representation of the amount of activity actually present in the sample.*
R	The analysis result is unusable and was rejected due to severe analytical and/or quality control problems. **NOTE:** *The radionuclide may or may not be present, and the result is known to be inaccurate or imprecise.*

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