Semiannual Groundwater Monitoring Report
Fourth Quarter 2008 and First Quarter 2009
Lockheed Martin Corporation, Beaumont Site 2
Beaumont, California

Prepared for:

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Prepared by:

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TC# 23522-0103 / September 2009

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LOCKHEED MARTIN

September 23, 2009

Mr. Daniel Zogaib
Southern California Cleanup Operations
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Subject: Submittal of the *Semiannual Groundwater Monitoring Report, Fourth Quarter 2008 and First Quarter 2009, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California*

Dear Mr. Zogaib:

Please find endosed one (1) hard copy of the body of the report and two (2) CDs of the report and appendices of the *Semiannual Groundwater Monitoring Report, Fourth Quarter 2008 and First Quarter 2009, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California*.

If you have any questions regarding this submittal, please contact me at 408.756.9595 or denise.kato@lmco.com.

Sincerely,

Denise Kato

Denise Kato
Remediation Analyst Senior Staff

Enclosures

Copy with Enc:
- Gene Matsushita, LMC (1 pdf and 1 hard copy)
- John Eisenbeis, Camp, Dresser, McKee (1 pdf)
- Thomas J . Villeneuve, Tetra Tech, Inc. (1 pdf and 1 hard copy)

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Semiannual Groundwater Monitoring Report
Third Quarter 2008 and First Quarter 2009
Lockheed Martin Corporation, Beaumont Site 2
Beaumont, California

September 2009
23522-0103

Prepared for
Lockheed Martin Corporation
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Prepared by
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1.0 INTRODUCTION

This Semiannual Groundwater Monitoring Report (Report) prepared by Tetra Tech, Inc. (Tetra Tech), on behalf of Lockheed Martin Corporation (LMC), presents the results of the Fourth Quarter 2008 and First Quarter 2009 groundwater quality monitoring activities of the Beaumont Site 2 (Site) Groundwater Monitoring Program (GMP). The Site is located southwest of the City of Beaumont, Riverside County, California (Figure 1-1). Currently, the Site is inactive with the exception of ongoing investigative activities performed under Consent Order (88/89 034) with the Department of Toxic Substances Control (DTSC).

The objectives of this Report are to:

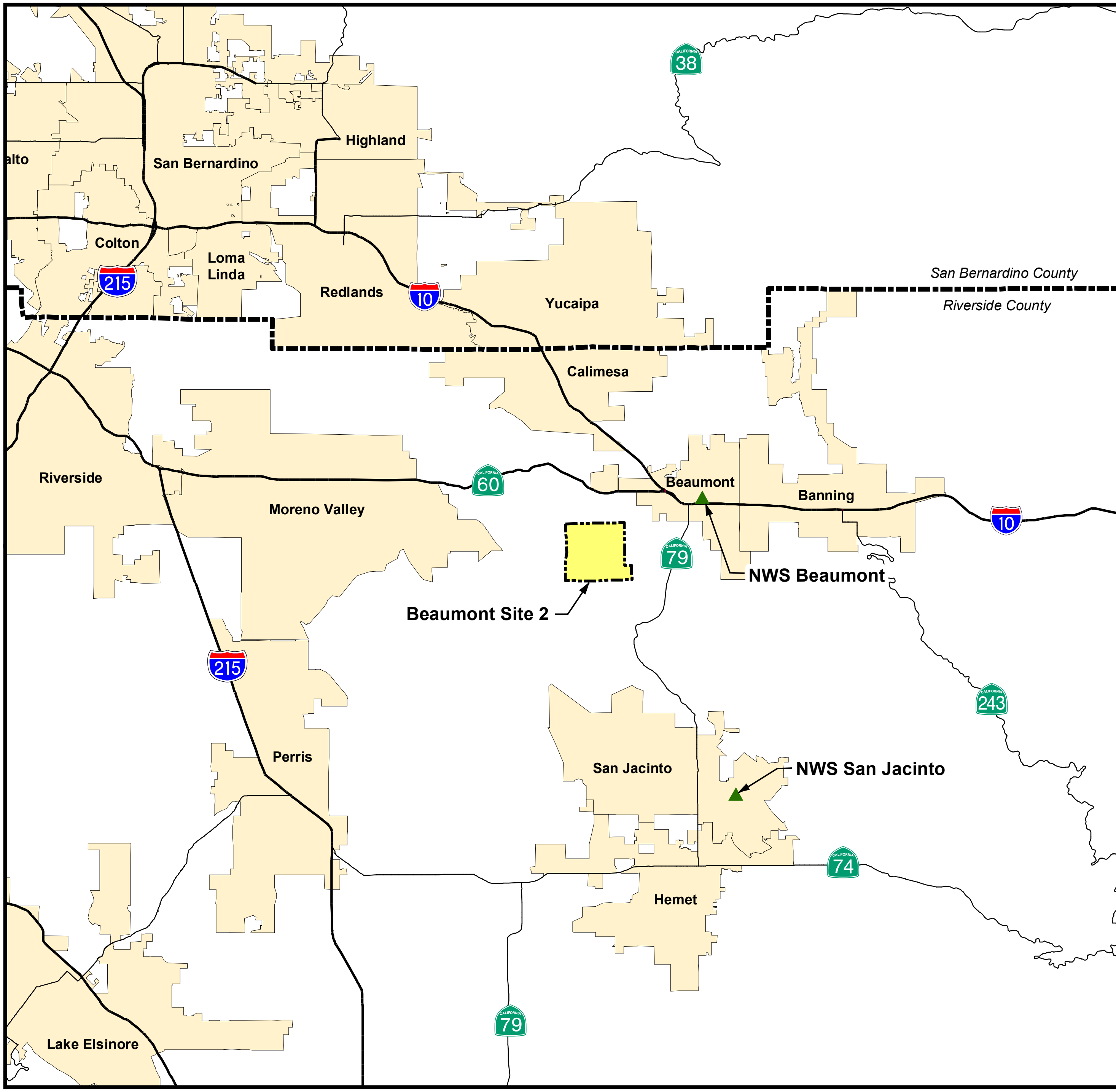
- Briefly summarize the Site history;
- Document the water quality monitoring procedures and results;
- Analyze and evaluate the water quality monitoring data generated.

This Report is organized into the following sections: 1) Introduction, 2) Summary of Monitoring Activities, 3) Groundwater Monitoring results, and 4) Summary and Conclusions. A summary of recent environmental activities and the current conceptual site model (CSM) can be found in Appendix A.

1.1 SITE BACKGROUND

The Site is a 2,668 acre parcel located southwest of Beaumont, California. The parcels that comprise the Site were owned by individuals and the United States (U.S.) government prior to 1958. Between 1958 and 1960, portions of the Site were purchased by the Grand Central Rocket Company (GCR) and utilized as a remote test facility for early space and defense program efforts. In 1960, Lockheed Aircraft Corporation (LAC) purchased one-half interest in GCR. GCR became a wholly-owned subsidiary of LAC in 1961. The remaining parcels of land that comprise the Site were purchased from the U.S. government between 1961 and 1964. In 1963, Lockheed Propulsion Company (LPC) became an operating division of LAC and was responsible for the operation of the Site until its closure in 1974. The Site was utilized by GCR and LPC from 1958 to 1974 for small rocket motor assembly, testing operations, propellant incineration, and minor disposal activities. Ogden Labs is known to have leased portions of the Site in the 1970s (Radian, 1986a).

In 1989, the DTSC issued a consent order requiring LMC to cleanup contamination at the Site related to past testing activities (CDHS, 1989). Based on investigative and cleanup activities performed at the Site, the DTSC issued a no further remedial action letter to LMC in 1993.



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Adapted from:

U.S. Census Bureau TIGER line data, 2000.

LEGEND

National Weather Service Station

Beaumont Site 2 Property Boundary

Beaumont Site 2

Figure 1-1
Regional Location of Beaumont Site 2

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Based on regulatory interest in perchlorate and 1,4-dioxane, a groundwater sample was collected from an inactive groundwater production well (identified as W2-3) at the Site in January 2003. The sample was analyzed for volatile organic compounds (VOCs), perchlorate, and 1,4-dioxane to determine the potential presence and concentration of those chemicals in groundwater. The analytical results indicated that VOCs and 1,4-dioxane were not present at or above their respective method detection limits (MDLs). However, perchlorate was reported at a concentration of 4,080 micrograms per liter (µg/L), which exceeded the California Department of Public Health drinking water notification level (DWNL) which existed at that time of 6 µg/L. In October 2007 the DWNL was replaced by the California Department of Public Health Maximum Contaminant Level (MCL) Based on the detection of perchlorate in the groundwater sample collected, the DTSC reopened the Site for further assessment.

Four primary historical operational areas have been identified at the Site (Figure 1-2). Each operational area was responsible for various activities associated with rocket motor assembly, testing, and propellant incineration. A brief description of each operational area follows:

Historical Operational Area J (Area J) –Final Assembly

Rocket motor casings with solid propellant were transported to Building 250 where final assembly of the rocket hardware was conducted. The building was used from 1970 to 1974 for final assembly and shipment of short range attack missile rocket motors. Rocket motor assembly operations included installation of the nozzle and headcap, pressure check of the motor, installation of electrical systems, and preparations for shipment. During plant closure in 1974, all usable parts of this facility were dismantled, taken off the Site, and sold (Radian, 1986a).

Historical Operational Area K (Area K) – Test Bays and Miscellaneous Facilities

The primary features included a large earthen structure known as the “Prism,” conditioning chambers, a centrifuge, and 4 test bays and 2 associated bunkers.

The Prism was reportedly built between 1984 and 1990 and was used to test radar by General Dynamics (Tetra Tech, 2007a). Details concerning construction of the Prism are not available, but it appears to have been constructed with soils from near the test bays.

The conditioning chambers were used to examine the effects of extreme temperatures on rocket motors and to meet specification requirements (Radian, 1986a). A centrifuge was located in the northwestern portion of Area K, where rocket motors were tested in order to determine if the solid propellant would separate from its casing under increased gravitational forces.

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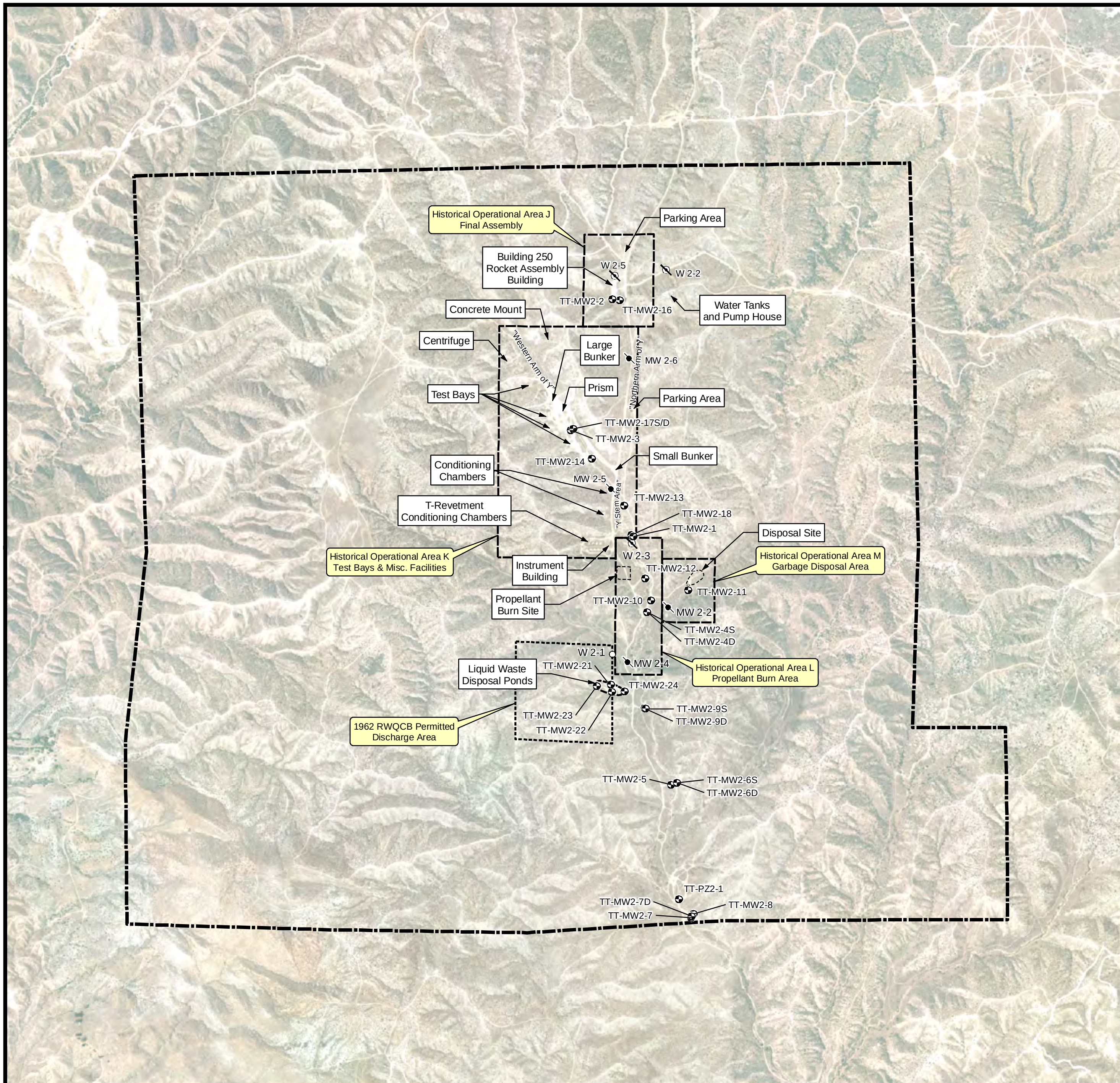

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Adapted from: March 2007 aerial photograph.

LEGEND

Groundwater Monitoring Well Location

Destroyed Production Well Location

Destroyed Monitoring Well Location

Reported Production Well Location

Beaumont Site 2 Property Boundary

Historical Operational Area Boundary

RWQCB Permitted Discharge Area

Liquid Waste Disposal Area

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Disposal and Propellent Burn Site perimeters are estimated (Radian, 1986a).

Beaumont Site 2

Figure 1-2
Historical Operational Areas and Site Features

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Previously, only 3 test bays were known; however, a former employee reported during a recent interview that a fourth test bay [located north of the other 3 bays] was also previously used in Area K. The initial testing activities had a history of explosions that destroyed complete test areas, especially during the period when GCR operated at the Site (Radian, 1986a). While vestiges from 3 test bays are currently visible at the Site, the fourth was reportedly destroyed by such an explosion during testing. Also reportedly, after motor failure, the area was checked to recover unburned propellant.

Historical Operational Area L (Area L) – Propellant Burn Area

Solid propellant was reportedly transported to the burn area and set directly on the ground surface for burning (Radian, 1986a). No pits or trenches were dug as part of the burning process. The solid propellant was saturated with diesel fuel to initiate combustion. Reportedly, the solid propellant would burn rapidly. There is no evidence or physical features that identify the precise location of burning activities. Two production wells were located in this area (W2-1 and W2-3). W2-1 was reported to have been part of the agricultural homestead. The origin of W2-3 is unknown. The use of the wells is unknown. A waste discharge permit from 1962 was recently discovered indicating that up to 5,000 gallons per year of waste water from rocket testing operations could be discharged into small surface depressions located in a small side canyon just south of Area L.

Historical Operational Area M (Area M) – Garbage Disposal Site

A garbage disposal area was located adjacent to a small creek at the Site (Radian, 1986a). Scrap metal, paper, wood, and concrete materials were disposed of at the disposal site by LPC. Hazardous materials, including explosives and propellants, were never disposed of at the disposal site by LPC according to employee interviews. Ogden Labs, a company that tested valves and explosive items, also used this disposal site. Reportedly, Ogden Labs disposed hazardous waste at the disposal site. In 1972, a Lockheed Safety Technician was exposed to toxic vapors of unsymmetrical dimethyl hydrazine (u-DMH) from a pressurized gas container located within the disposal site. Based on potential exposure risks to occupants, LPC's safety group required Ogden Labs to take measures to remove any potentially hazardous materials at the disposal site. Shortly thereafter, a disposal company was contracted by Ogden Labs to clean up the disposal site (Radian, 1986a).

2.0 SUMMARY OF MONITORING ACTIVITIES

Section 2 summarizes the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events conducted at the Site. The results from these monitoring events are discussed in Section 3.0.

2.1 GROUNDWATER LEVEL MEASUREMENTS

The Fourth Quarter 2008 groundwater level measurements were collected from 33 monitoring wells and 1 piezometer on December 04, 2008. The First Quarter 2009 groundwater level measurements were collected from 56 monitoring wells and 1 piezometer between February 25, 2009 and March 2, 2009. Figure 2-1 presents a site map showing the well locations. Copies of the field data sheets from the water quality monitoring events are presented in Appendix B. A summary of well construction details is presented in Appendix C.

2.2 GROUNDWATER SAMPLING

The GMP has a quarterly, semiannual, and annual frequency. Both groundwater and surface water are sampled as part of the GMP. The annual event is the major monitoring event and the quarterly and semiannual events are smaller, minor events. All new wells are sampled quarterly for 1 year after which they are evaluated and reclassified. The semiannual event includes, horizontal extent, vertical distribution, increasing contaminant, and guard wells, and are sampled during the second and fourth quarter of each year. In addition to the quarterly and semi annual wells, the annual event includes background wells and takes place during the second quarter of each year. The groundwater monitoring schedule is reviewed and modified as necessary annually during the Second Quarter groundwater monitoring event. Modifications are done in accordance with the approved SAP. Fourth Quarter 2008 and First Quarter 2009 follow the schedule proposed in the Second and Third Quarter 2007 monitoring report (Tetra Tech, 2008a) which was presented to the DTSC in March 2008 and approved with no comments to the proposed schedule. During the Fourth Quarter 2008 monitoring event 26 groundwater samples and 2 surface water samples were collected between November 14 and December 1, 2008. During the First Quarter 2009 monitoring event 8 groundwater samples and 1 surface water samples were collected between March 11 and May 5, 2009. Additionally 5 storm water samples were collected during a storm event on February 16, 2009. Table 2-1 and 2-2 lists the wells monitored for the Fourth Quarter 2008 and First Quarter 2009 monitoring events, analytical methods, sampling dates, and Quality Assurance/Quality Control (QA/QC) samples collected. Figures 2-2 and 2-3 illustrate the well locations sampled. Groundwater sampling, analytical, and QA/QC procedures for the monitoring event were described in the Groundwater Monitoring Well Installation Work Plan (Tetra Tech, 2004a) and the Groundwater Sampling and Analysis Plan (Tetra Tech, 2007b).

The following water quality field parameters were observed and recorded on field data sheets (Appendix B) during well purging activities: water level, temperature, pH, electrical conductivity (EC), turbidity, dissolved oxygen (DO) and oxidation reduction potential (ORP). Collection of water quality parameters was initiated when at least 1 discharge hose / pump volume had been removed and purging was considered complete when the above parameters had stabilized, or the well was purged dry (evacuated). Stabilization of water quality parameters was used as an indication that representative formation water had entered the well and was being purged. The criteria for stabilization of these parameters are as follows: water level ± 0.1 foot, pH ± 0.1, and EC ± 3%, turbidity < 10 nephelometric turbidity units (NTUs) (if > 10 NTUs ± 10%), DO ± 0.3 mg/L and ORP ± 10 mV. Sampling instruments and equipment were maintained, calibrated, and operated in accordance with the manufacturer’s specifications, guidelines, and recommendations. Groundwater samples were collected from the monitoring wells by low-flow purging and sampling through a dedicated double valve sampling pump or a portable bladder pump.

For the Fourth Quarter 2008 and First Quarter 2009 monitoring events, every effort was made to collect groundwater samples in order of increasing perchlorate and TCE concentration. Samples were placed in appropriate EPA method specified containers. A sample identification label was affixed to each sample container, and sample custody was maintained by a chain-of-custody record. Groundwater samples collected for the monitoring events were chilled and transported to EMAX Laboratories Inc. and E. S. Babcock & Sons, Inc., state-accredited analytical laboratories, via courier, thus maintaining proper temperatures and sample integrity. Trip blanks (LTBs) were collected for the monitoring events to assess cross-contamination potential of water samples while in transit. Equipment blanks (LEBs) were collected when sampling with non-dedicated equipment to assess cross-contamination potential of water samples via sampling equipment.

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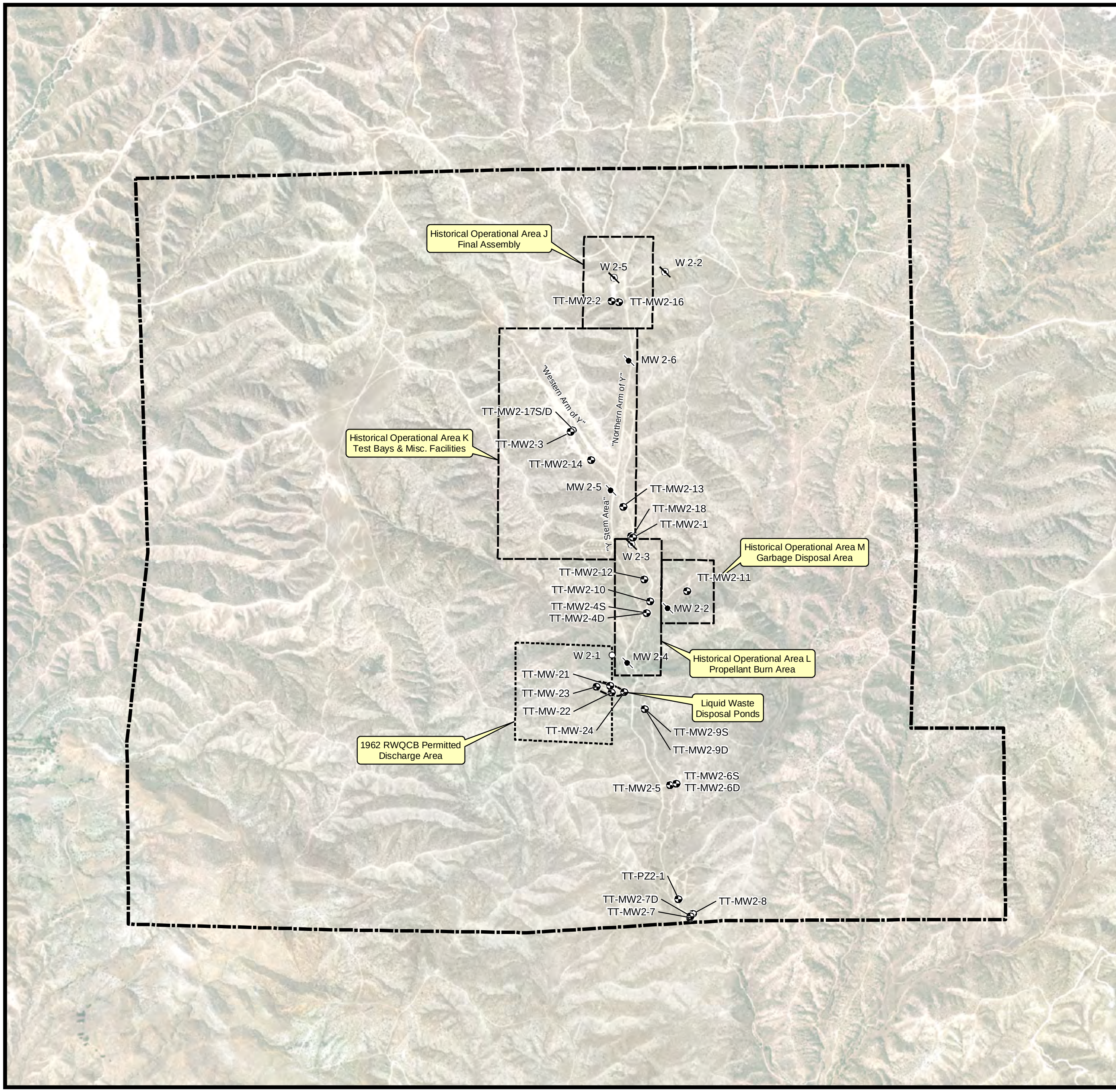

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Adapted from: March 2007 aerial photograph.

LEGEND

- Groundwater Monitoring Well Location
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Beaumont Site 2 Property Boundary
- Historical Operational Area Boundary
- RWQCB Permitted Discharge Area
- Liquid Waste Disposal Area

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 2-1

Site Map

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Table 2-1 Sampling Schedule and Analysis Method - Fourth Quarter 2008

Monitoring Well Location	Sample Date	VOCs (EPA 8260B)	Perchlorate (EPA 314.0)	Comments and QA /QC Samples
WS-1-Top	11/17/08	-	X	
WS-1-Bottom	11/17/08	-	X	
TT-MW2-1	11/20/08	-	X	Duplicate
TT-MW2-4S	11/14/08	-	X	MS/MSD
TT-MW2-5	11/19/08	-	X	
TT-MW2-6S	11/19/08	-	X	Duplicate
TT-MW2-6D	11/19/08	-	X	
TT-MW2-7	11/18/08	-	X	Duplicate
TT-MW2-7D	11/18/08	X	X	
TT-MW2-8	11/20/08	-	X	
TT-MW2-9S	11/19/08	-	X	
TT-MW2-9D	11/14/08	-	X	
TT-MW2-10	11/14/08	-	X	
TT-MW2-11	11/25/08	-	X	
TT-MW2-12	11/17/08	-	X	
TT-MW2-13	11/19/08	-	X	
TT-MW2-14	12/01/08	-	X	
TT-MW2-17S	11/19/08	-	X	
TT-MW2-17D	11/25/08	-	X	
TT-MW2-18	12/01/08	-	X	
TT-MW2-19S	11/18/08	-	X	
TT-MW2-19D	11/17/08	-	X	
TT-MW2-20S	11/17/08	-	X	
TT-MW2-20D	11/17/08	-	X	
TT-MW2-21	11/18/08	X	X	
TT-MW2-22	11/25/08	X	X	Duplicate
TT-MW2-23	11/17/08	X	X	
TT-MW2-24	11/25/08	X	X	
			Fourth Quarter 2008: Total Sample Locations:	28
			Total Samples Collected:	28

Notes:
EPA - United States Environmental Protection Agency.
QA/QC - Quality assurance / quality control
VOCs - Volatile Organic Compounds
MS / MSD- Matrix Spike / Matrix Spike Duplicate.
"-" Not analyzed

Table 2-2 Sampling Schedule and Analysis Method - First Quarter 2009

Monitoring Well Location	Sample Date	VOCs (EPA 8260B)	Perchlorate (EPA 331.0)	Perchlorate (EPA 314.0)	1,4-Dioxane (8270 SIM)	RDX (EPA 8330)	RDX (EPA 529)	Comments and QA /QC Samples
WS-1 (1)	3/12/2009	-	X	-	-	-	-	
SW-01	NA	-	-	-	-	-	-	Dry
SW-02	2/16/2009	X	-	X	-	-	-	
SW-03	2/16/2009	X	-	X	-	-	-	
SW-04	NA	-	-	-	-	-	-	Dry
SW-05	2/16/2009	X	-	X	-	-	-	Duplicate
SW-06	2/16/2009	X	-	X	-	-	-	
SW-07	2/16/2009	X	-	X	-	-	-	MS/MSD
TT-MW2-13	03/11/09	-	-	-	-	X	X	
TT-MW2-19S	03/12/09	-	X	-	-	-	-	
TT-MW2-19D	03/12/09	-	X	-	-	-	-	
TT-MW2-20S	03/12/09	-	X	-	-	-	-	
TT-MW2-20D	03/12/09	-	X	-	-	-	-	
TT-MW2-22	03/20/09	-	-	-	X	-	-	
TT-MW2-24	05/05/09	-	-	-	-	-	X	
TT- PZ-1	04/27/09	X	X	-	-	-	-	
First Quarter 2009: Total Sample Locations:								16
Total Samples Collected:								14

Notes:
- EPA - United States Environmental Protection Agency.
- QA/QC - Quality assurance / quality control
- VOCs - Volatile Organic Compounds
- RDX - Research Department composition X
- MS / MSD- Matrix Spike / Matrix Spike Duplicate.
- (1) Former WS-1-Bottom location
- "-" Not analyzed

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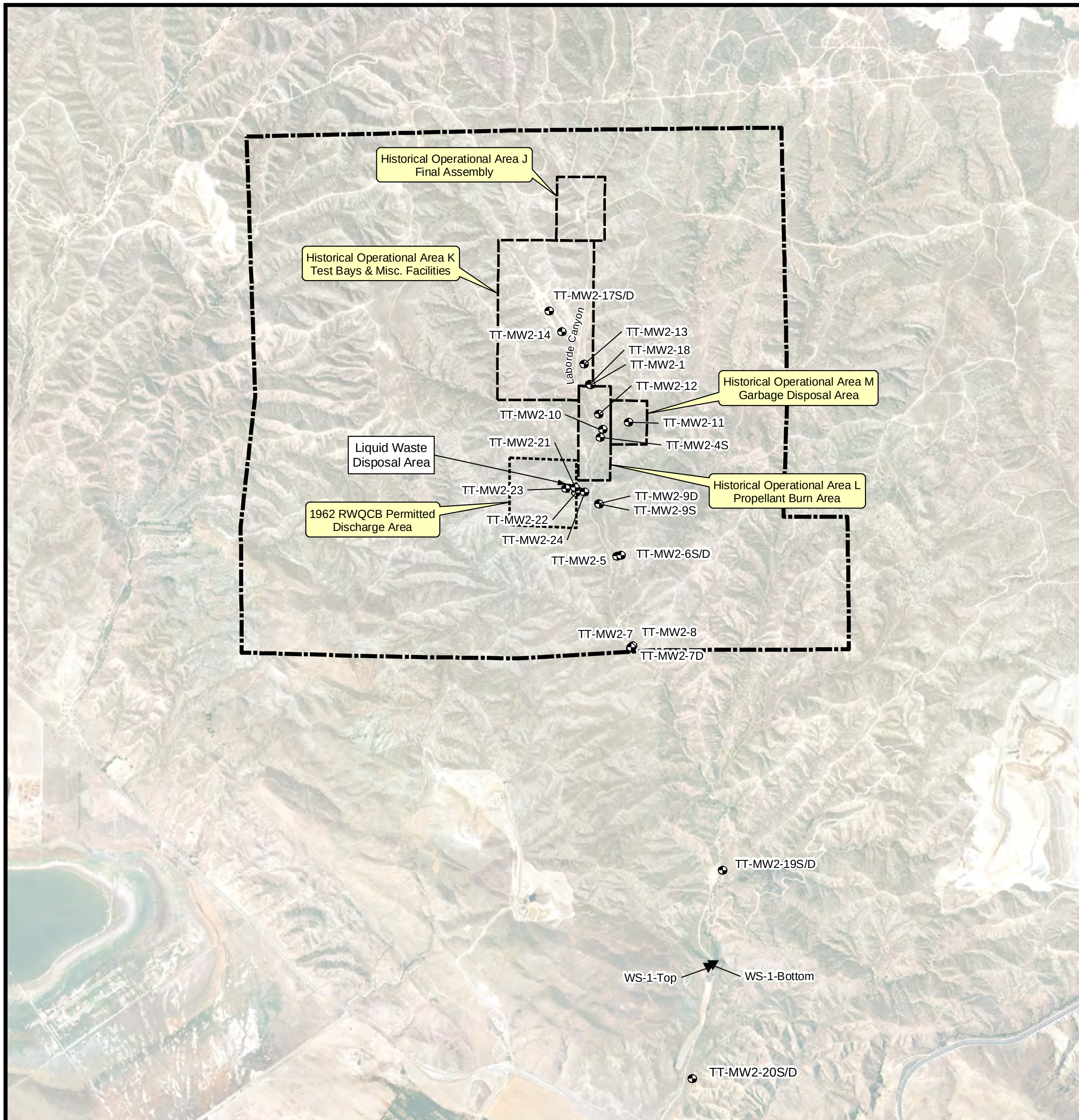

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Feet

Adapted from: April 2007 aerial photograph.

LEGEND

- Groundwater Monitoring Well Location
- Surface Water Sampling Location
- Historical Operational Area Boundary
- RWQCB Permitted Discharge Area
- Liquid Waste Disposal Area
- Beaumont Site 2 Property Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 2-2

Fourth Quarter 2008 Sample Locations

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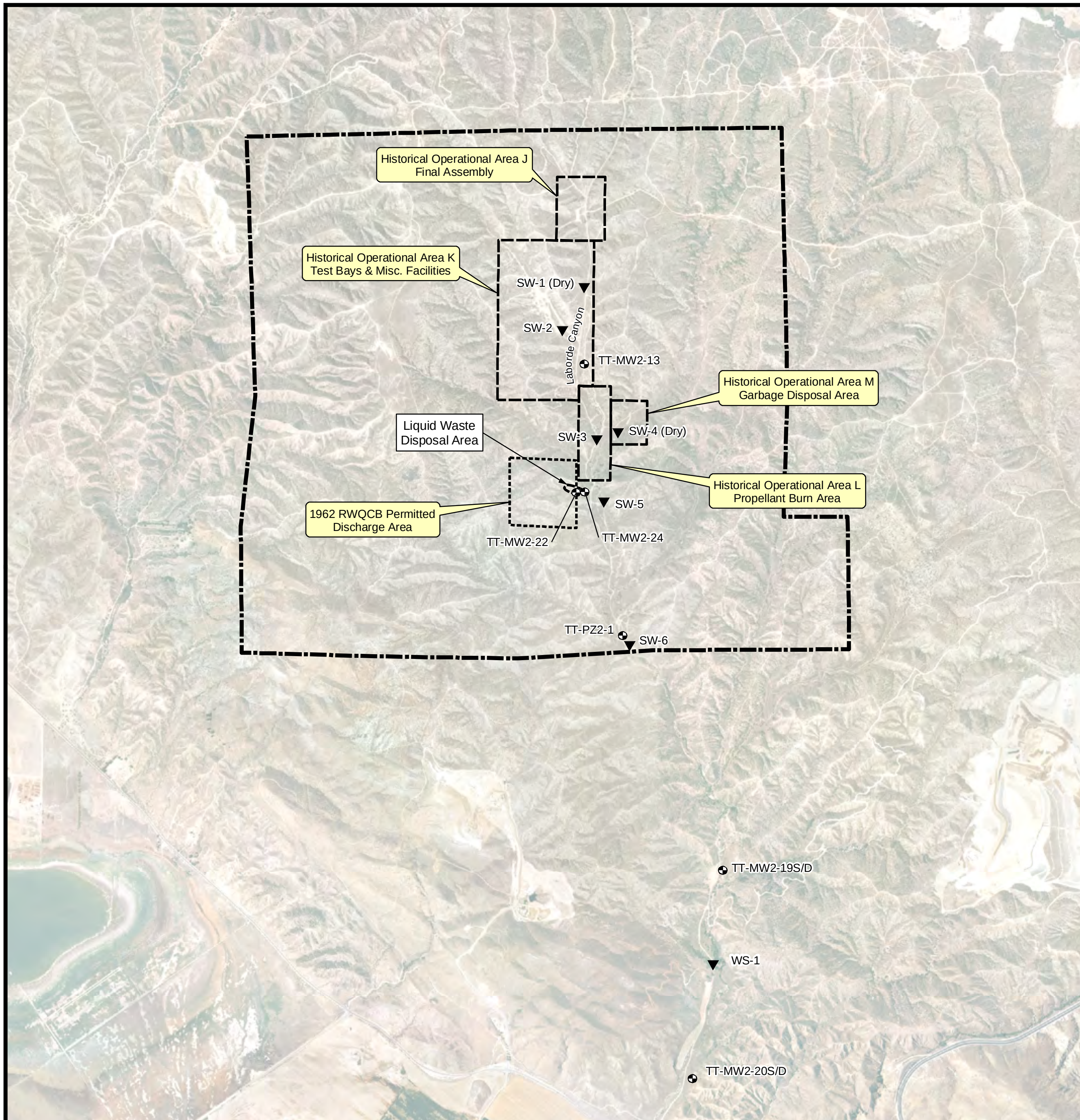

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Feet

Adapted from: April 2007 aerial photograph.

LEGEND

Groundwater Monitoring Well Location

Surface Water Sampling Location

Historical Operational Area Boundary

RWQCB Permitted Discharge Area

Liquid Waste Disposal Area

Beaumont Site 2 Property Boundary

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 2-3

First Quarter 2009 Sample Locations

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2.3 SURFACE WATER SAMPLING

Surface water locations SW-01 through SW-07 are located in the ephemeral creek bed that runs through Laborde Canyon. Surface water runoff collects in the creek during periods of heavy precipitation and runs south through the Site and the former Wolfskill property, eventually crossing under Gilman Hot Springs Road. Water is present in the creek bed only during periods of heavy, prolonged precipitation. WS-1-Top and WS-1-Bottom are located at a spring on the former Wolfskill property. Sample location WS-1-Top is a hand dug shallow depression located upslope from the actual spring. The sampling location was chosen because the presence of water was indicated by heavy vegetation, primarily cattails, which would indicate near surface water. The depression was hand dug at the time of the initial sampling to facilitate collection of sufficient water for analysis and has contained water since that time. Sample location WS-1-Bottom is collected from a location where surface water flows out of the area of heavy vegetation prior to crossing the access road.

Surface water samples were collected from 2 locations during Fourth Quarter 2008, WS-1-Top and WS-1-Bottom, and from 1 location during First Quarter 2009, WS-1 the former WS-1-Bottom location. Samples were tested for perchlorate. Additionally, storm water samples were collected from 5 locations, SW-02, SW-03, SW-05, SW-06, and SW-07, during a storm event on February 16, 2008. Storm water samples were tested for VOCs, and perchlorate. No other surface water samples were collected during this reporting period. Figure 2-4 presents the surface and storm water sampling locations.

2.4 ANALYTICAL DATA QA/QC

The groundwater samples collected were analyzed using approved EPA methods. Since the analytical data were obtained by following EPA-approved method criteria, the data were validated using the EPA-approved evaluation methods described in the National Functional Guidelines (EPA, 1999 and EPA, 2004).

Quality control parameters used in validating data results include: holding times, field blanks, laboratory control samples, method blanks, duplicate environmental samples, spiked samples, and surrogate and spike recovery data.

2.5 HABITAT CONSERVATION

All monitoring activities were performed in accordance with the U.S. Fish and Wildlife Service approved Habitat Conservation Plan (HCP) [USFWS, 2005] and subsequent clarifications (LMC, 2006a and 2006b) of the HCP. Groundwater sampling activities were conducted with light duty vehicles and as specified in the Low Affect HCP do not require biological monitoring.

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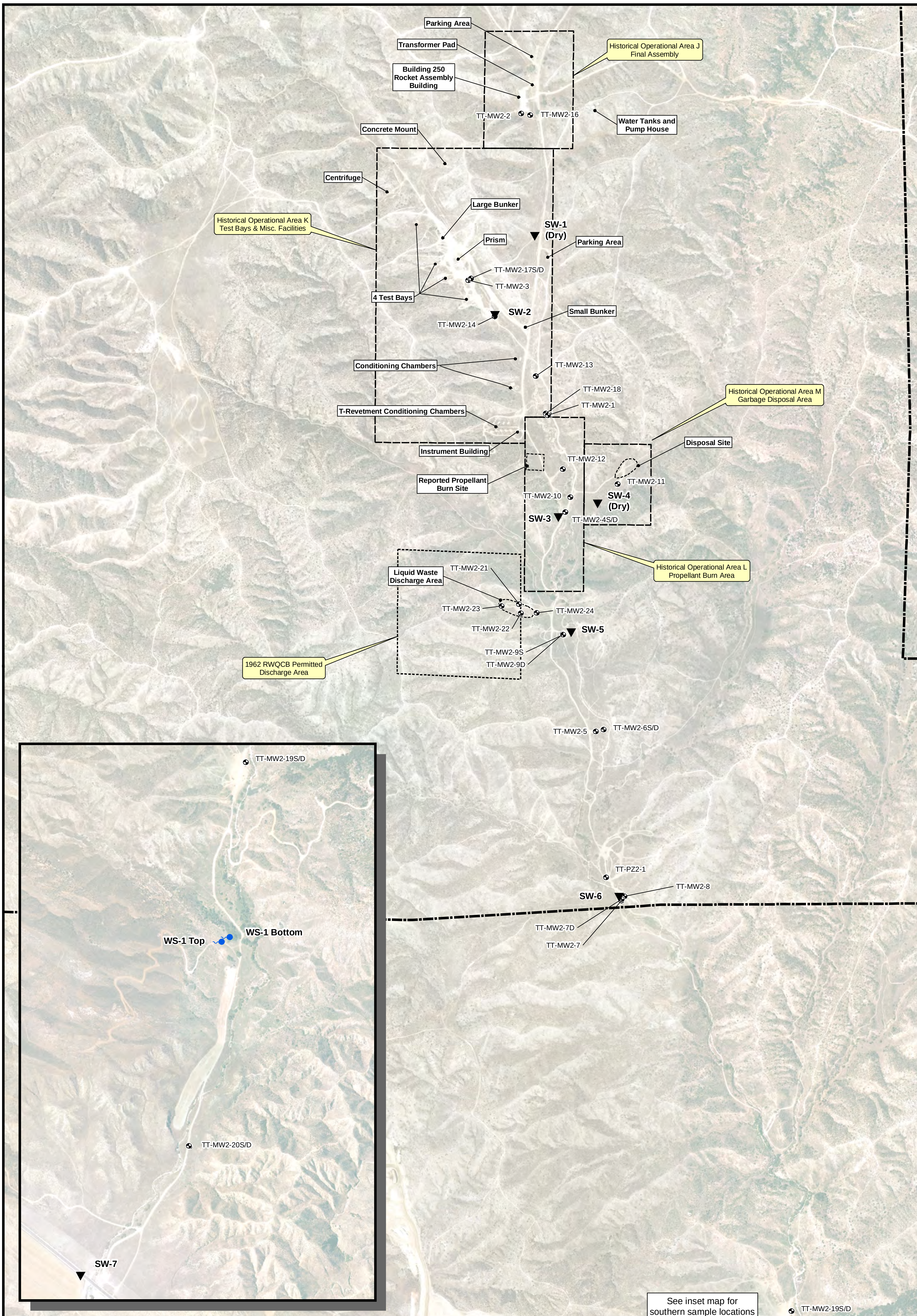

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Surface Water Sampling Location	RWQCB Permitted Discharge Area
Spring Sampling Location	Historical Operational Area Boundary
Monitoring Well Location	Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 2-4

Surface and Storm Water Sampling Locations

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3.0 GROUNDWATER MONITORING RESULTS

The results of the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events are presented in the following subsections. These subsections include tabulated summaries of the groundwater elevation and water quality data, groundwater elevation maps, and analyte results figures.

3.1 GROUNDWATER ELEVATION

Based on the groundwater levels measured during the Fourth Quarter 2008 and First Quarter 2009 monitoring events, depth to groundwater at the Site ranges from about 61 feet bgs in the northern portion (elevation of 2,076 feet msl, TT-MW2-16) to about 18 feet bgs in the southern portion (elevation of 1,818 feet msl, TT-MW2-8). A tabulated summary of groundwater depths and elevations is presented in Table 3-1. Changes in groundwater elevations from the previous monitoring event for wells monitored for the Fourth Quarter 2008 and First Quarter 2009 monitoring events are shown on Figures 3-1 and 3-2, respectively, and hydrographs for individual wells are presented in Appendix D.

In comparison to the Third Quarter 2008 quarterly monitoring event, groundwater levels measured during the Fourth Quarter 2008 monitoring event decreased in QAL/wSTF screened monitoring wells an average of 0.46 feet and decreased in STF screened monitoring wells an average of 0.26 feet.

In comparison to the Fourth Quarter 2008 quarterly monitoring event, groundwater levels measured during the First Quarter 2009 monitoring event decreased in QAL/wSTF screened monitoring wells an average of 0.03 feet and decreased in STF screened monitoring wells an average of 0.16 feet.

3.2 GROUNDWATER FLOW

Groundwater contour maps for first groundwater and the STF HSU from Fourth Quarter 2008 groundwater levels are presented in Figures 3-3 and 3-4 and from First Quarter 2009 groundwater levels are presented in Figures 3-5 and 3-6, respectively. Hydrographs for individual wells are presented in Appendix D.

Table 3-1 Groundwater Elevation Data - Fourth Quarter 2008 and First Quarter 2009

Well ID	HSU	Measuring Point Elevation (feet msl)	Fourth Quarter 2008				First Quarter 2009			
			Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Third Quarter 2008 (feet)	Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Fourth Quarter 2008 (feet)
TT-MW2-1	QAL / WSTF	2035.21	12/04/08	56.97	1978.24	-0.18	03/02/09	57.27	1977.94	-0.30
TT-MW2-2	STF	2137.75	12/04/08	69.80	2067.95	-0.02	03/02/09	69.98	2067.77	-0.18
TT-MW2-3	QAL / WSTF	2094.66	12/04/08	70.25	2024.41	0.00	03/02/09	70.54	2024.12	-0.29
TT-MW2-4S	STF	1986.94	12/04/08	50.54	1936.40	-0.14	02/25/09	50.52	1936.42	0.02
TT-MW2-4D	STF	1987.17	12/04/08	57.30	1929.87	-0.16	02/25/09	57.40	1929.77	-0.10
TT-MW2-5	QAL / WSTF	1911.31	12/04/08	39.42	1871.89	-0.43	02/25/09	39.71	1871.60	-0.29
TT-MW2-6S	QAL / WSTF	1908.00	12/04/08	35.88	1872.12	-0.52	02/25/09	36.11	1871.89	-0.23
TT-MW2-6D	STF	1908.07	12/04/08	36.82	1871.25	-0.45	02/25/09	37.10	1870.97	-0.28
TT-MW2-7	QAL / WSTF	1839.25	12/04/08	20.01	1819.24	-1.16	02/25/09	19.42	1819.83	0.59
TT-MW2-7D	STF	1838.96	12/04/08	18.30	1820.66	-0.65	02/25/09	17.86	1821.10	0.44
TT-MW2-8	QAL / WSTF	1836.32	12/04/08	17.91	1818.41	-0.76	02/25/09	17.21	1819.11	0.70
TT-MW2-9S	QAL / WSTF	1938.38	12/04/08	38.30	1900.08	-0.95	02/25/09	37.96	1900.42	0.34
TT-MW2-9D	STF	1938.78	12/04/08	42.40	1896.38	-0.39	02/25/09	42.52	1896.26	-0.12
TT-MW2-10	QAL / WSTF	2001.57	12/04/08	57.67	1943.90	-0.03	02/25/09	57.66	1943.91	0.01
TT-MW2-11	QAL / WSTF	2004.51	12/04/08	50.90	1953.61	-1.73	03/02/09	49.52	1954.99	1.38
TT-MW2-12	STF	2016.26	12/04/08	50.37	1965.89	-0.06	03/02/09	50.50	1965.76	-0.13
TT-MW2-13	QAL / WSTF	2049.39	12/04/08	66.12	1983.27	-0.21	03/02/09	66.46	1982.93	-0.34
TT-MW2-14	QAL / WSTF	2074.78	12/04/08	66.19	2008.59	-0.53	03/02/09	66.49	2008.29	-0.30
TT-MW2-16	QAL / WSTF	2137.20	12/04/08	60.90	2076.30	-0.79	03/02/09	61.08	2076.12	-0.18
TT-MW2-17S	QAL / WSTF	2095.55	12/04/08	70.97	2024.58	0.06	03/02/09	71.24	2024.31	-0.27
TT-MW2-17D	QAL / WSTF	2095.33	12/04/08	71.15	2024.18	0.07	03/02/09	71.45	2023.88	-0.30
TT-MW2-18	STF	2035.32	12/04/08	56.88	1978.44	-0.15	03/02/09	57.18	1978.14	-0.30
TT-MW2-19S	QAL / WSTF	1698.34	12/04/08	45.62	1652.72	6.95	03/02/09	45.36	1652.98	0.26
TT-MW2-19D	STF	1698.37	12/04/08	28.10	1670.27	31.93	03/02/09	25.51	1672.86	2.59
TT-MW2-20S	QAL / WSTF	1587.77	12/04/08	33.18	1554.59	-1.20	03/02/09	34.01	1553.76	-0.83
TT-MW2-20D	STF	1587.48	12/04/08	32.44	1555.04	-1.22	03/02/09	33.23	1554.25	-0.79
TT-MW2-21	STF	1978.45	12/04/08	65.96	1912.49	0.02	02/25/09	66.11	1912.34	-0.15
TT-MW2-22	STF	1975.86	12/04/08	64.91	1910.95	0.06	02/25/09	65.00	1910.86	-0.09
TT-MW2-23	STF	1995.17	12/04/08	82.57	1912.60	0.02	02/25/09	82.72	1912.45	-0.15

Notes:

NA - Not applicable
msl - Mean sea level
HSU - Hydrostratigraphic Unit
STF - San Timoteo formation
WSTF - weathered San Timoteo formation
QAL / WSTF - Quaternary alluvium / weathered San Timoteo formation
#.## - Denotes an increase in groundwater elevation
- #.## - Denotes a decrease in groundwater elevation

Table 3 1 Groundwater Elevation Data - Fourth Quarter 2008 and First Quarter 2009 (Continued)

			Fourth Quarter 2008				First Quarter 2009			
Well ID	HSU	Measuring Point Elevation (feet msl)	Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Third Quarter 2008 (feet)	Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Fourth Quarter 2008 (feet)
TT-MW2-24	QAL / WSTF	1964.26	12/04/08	53.68	1910.58	0.00	02/25/09	53.66	1910.60	0.02
TT-MW2-25	STF	1966.96	12/04/08	63.68	1903.28	NA	02/25/09	63.87	1903.09	-0.19
TT-MW2-26	QAL / WSTF	1944.43	12/04/08	36.88	1907.55	NA	02/25/09	36.55	1907.88	0.33
TT-MW2-27	QAL / WSTF	1948.27	12/04/08	48.79	1899.48	NA	02/25/09	48.86	1899.41	-0.07
TT-MW2-28	QAL / WSTF	1995.65	-	-	-	-	03/02/09	60.87	1934.78	NA
TT-MW2-29A	QAL / WSTF	2147.77	-	-	-	-	03/02/09	Dry	Dry	NA
TT-MW2-29B	QAL / WSTF	2147.90	-	-	-	-	03/02/09	121.87	2026.03	NA
TT-MW2-29C	STF	2147.83	-	-	-	-	03/02/09	127.74	2020.09	NA
TT-MW2-30A	QAL / WSTF	2074.37	-	-	-	-	03/02/09	72.92	2001.45	NA
TT-MW2-30B	QAL / WSTF	2074.41	-	-	-	-	03/02/09	75.36	1999.05	NA
TT-MW2-30C	STF	2074.35	-	-	-	-	03/02/09	77.63	1996.72	NA
TT-MW2-31A	STF	2036.11	-	-	-	-	03/02/09	58.50	1977.61	NA
TT-MW2-31B	STF	2036.15	-	-	-	-	03/02/09	66.43	1969.72	NA
TT-MW2-32	QAL / WSTF	2004.87	-	-	-	-	03/02/09	53.43	1951.44	NA
TT-MW2-33A	QAL / WSTF	2070.54	-	-	-	-	03/02/09	61.22	2009.32	NA
TT-MW2-33B	STF	2070.54	-	-	-	-	03/02/09	66.01	2004.53	NA
TT-MW2-33C	STF	2070.54	-	-	-	-	03/02/09	64.08	2006.46	NA
TT-MW2-34A	QAL / WSTF	2066.84	-	-	-	-	03/02/09	65.74	2001.10	NA
TT-MW2-34B	QAL / WSTF	2066.85	-	-	-	-	03/02/09	72.83	1994.02	NA
TT-MW2-34C	STF	2066.84	-	-	-	-	03/02/09	74.53	1992.31	NA
TT-MW2-35A	STF	2003.20	-	-	-	-	03/02/09	51.87	1951.33	NA
TT-MW2-35B	STF	2003.20	-	-	-	-	03/02/09	55.03	1948.17	NA
TT-MW2-36A	QAL / WSTF	2100.99	-	-	-	-	03/02/09	78.98	2022.01	NA
TT-MW2-36B	QAL / WSTF	2101.04	-	-	-	-	03/02/09	79.68	2021.36	NA
TT-MW2-36C	STF	2100.88	-	-	-	-	03/02/09	79.66	2021.22	NA
TT-MW2-37A	STF	1963.62	-	-	-	-	03/02/09	61.86	1901.76	NA
TT-MW2-37B	QAL / WSTF	1963.67	-	-	-	-	03/02/09	64.78	1898.89	NA
TT- PZ2-1	QAL / WSTF	1847.06	12/04/08	19.10	1827.96	-0.40	02/25/09	18.63	1828.43	0.47

Notes:

NA - Not applicable
msl - Mean sea level
HSU - Hydrostratigraphic Unit
STF - San Timoteo formation
WSTF - weathered San Timoteo formation
QAL / WSTF - Quaternary alluvium / weathered San Timoteo formation
#.## - Denotes an increase in groundwater elevation
- #.## - Denotes a decrease in groundwater elevation

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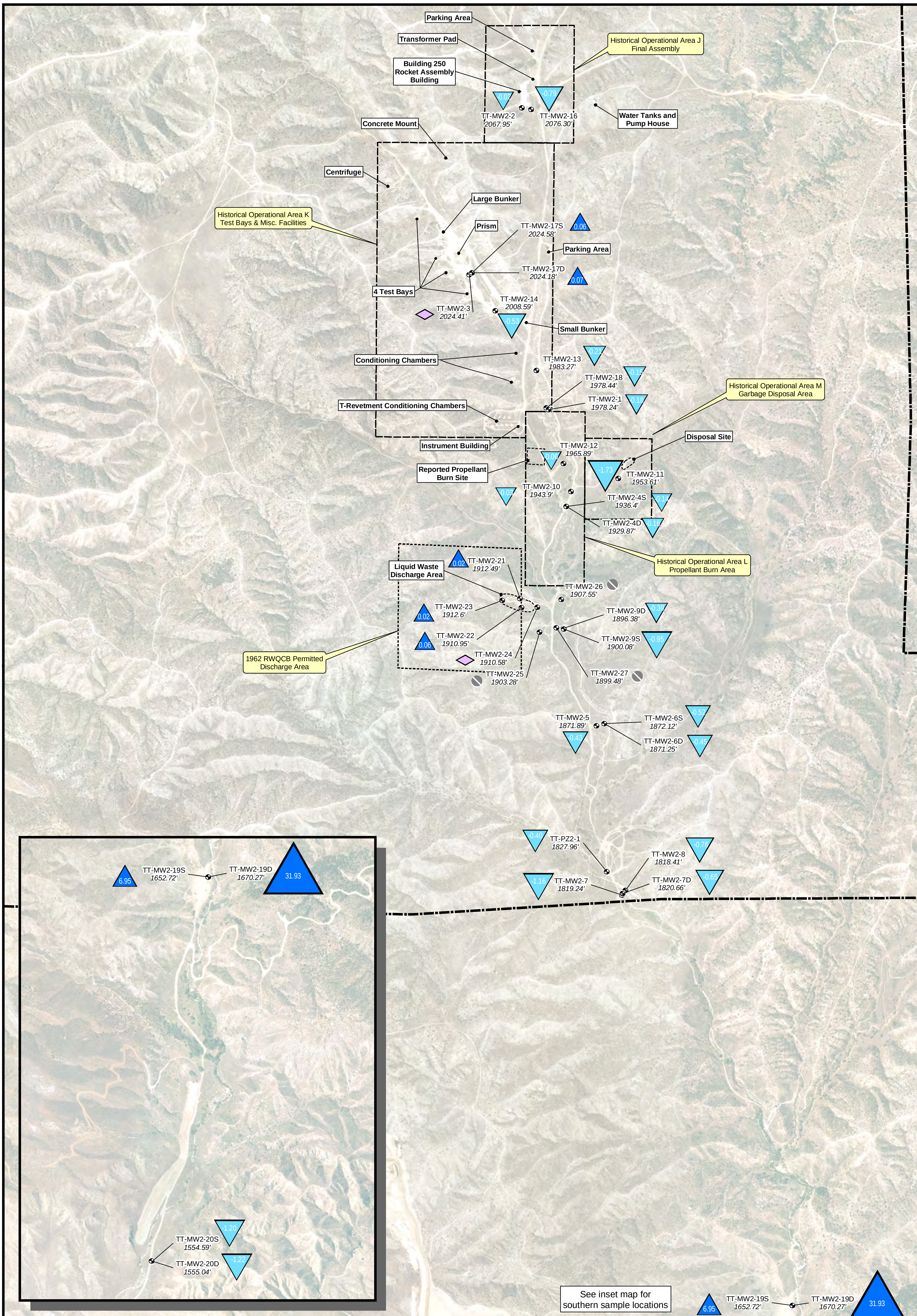

LEGEND

- Monitoring Well Location
- 0.21 Groundwater Elevation Increase *
- -0.11 Groundwater Elevation Decrease *
- Groundwater Elevation Unchanged
- Groundwater Change Data Unavailable
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

* (feet) compared to Third Quarter 2008.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-1

Fourth Quarter 2008 Changes in Groundwater Elevations

TETRA TECH

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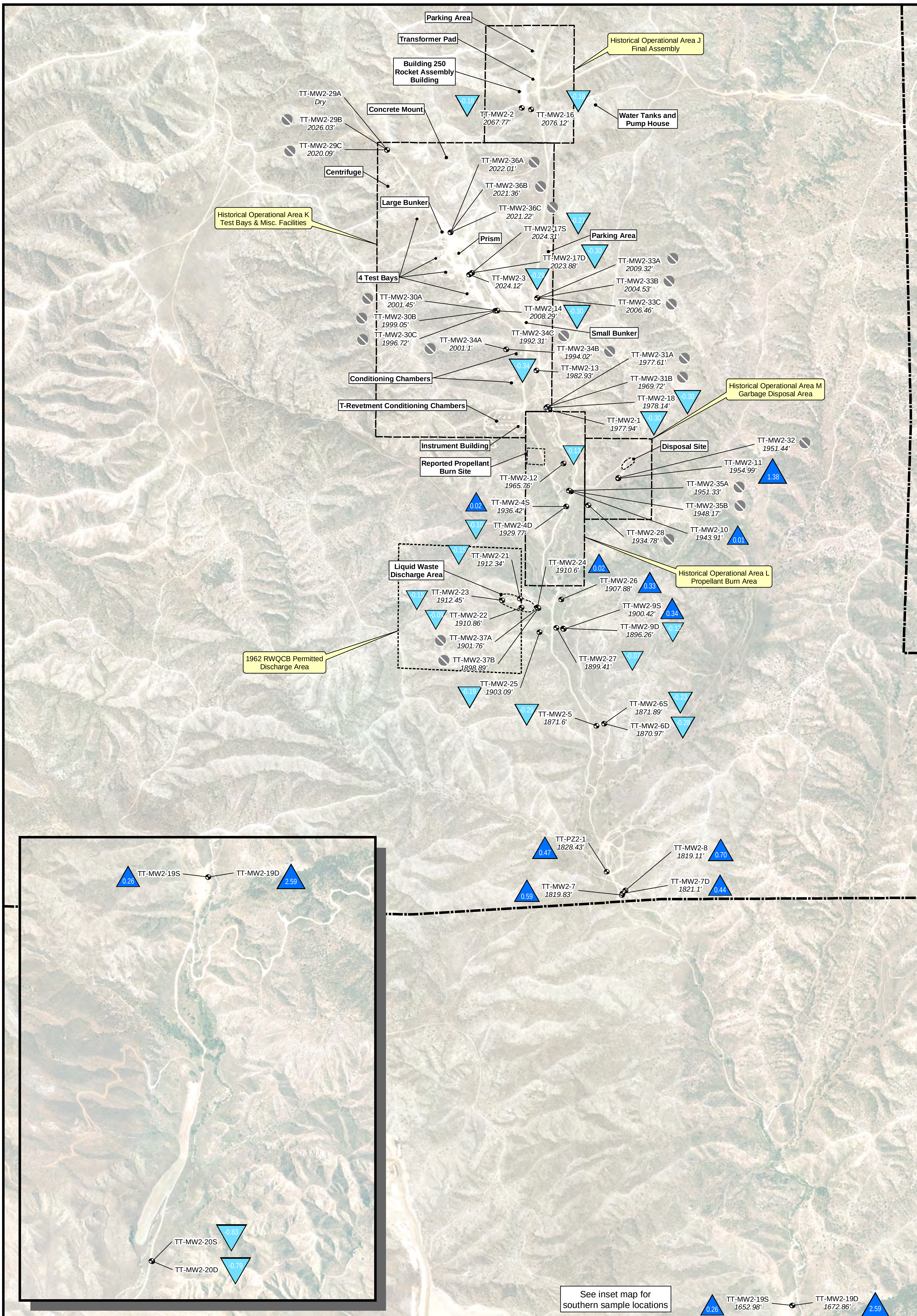

LEGEND

- Monitoring Well Location
- 0.21 Groundwater Elevation Increase *
- 0.11 Groundwater Elevation Decrease *
- Groundwater Change Data Unavailable
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

N

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

* (feet) compared to Fourth Quarter 2008.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-2

First Quarter 2009 Changes in Groundwater Elevations

TETRA TECH

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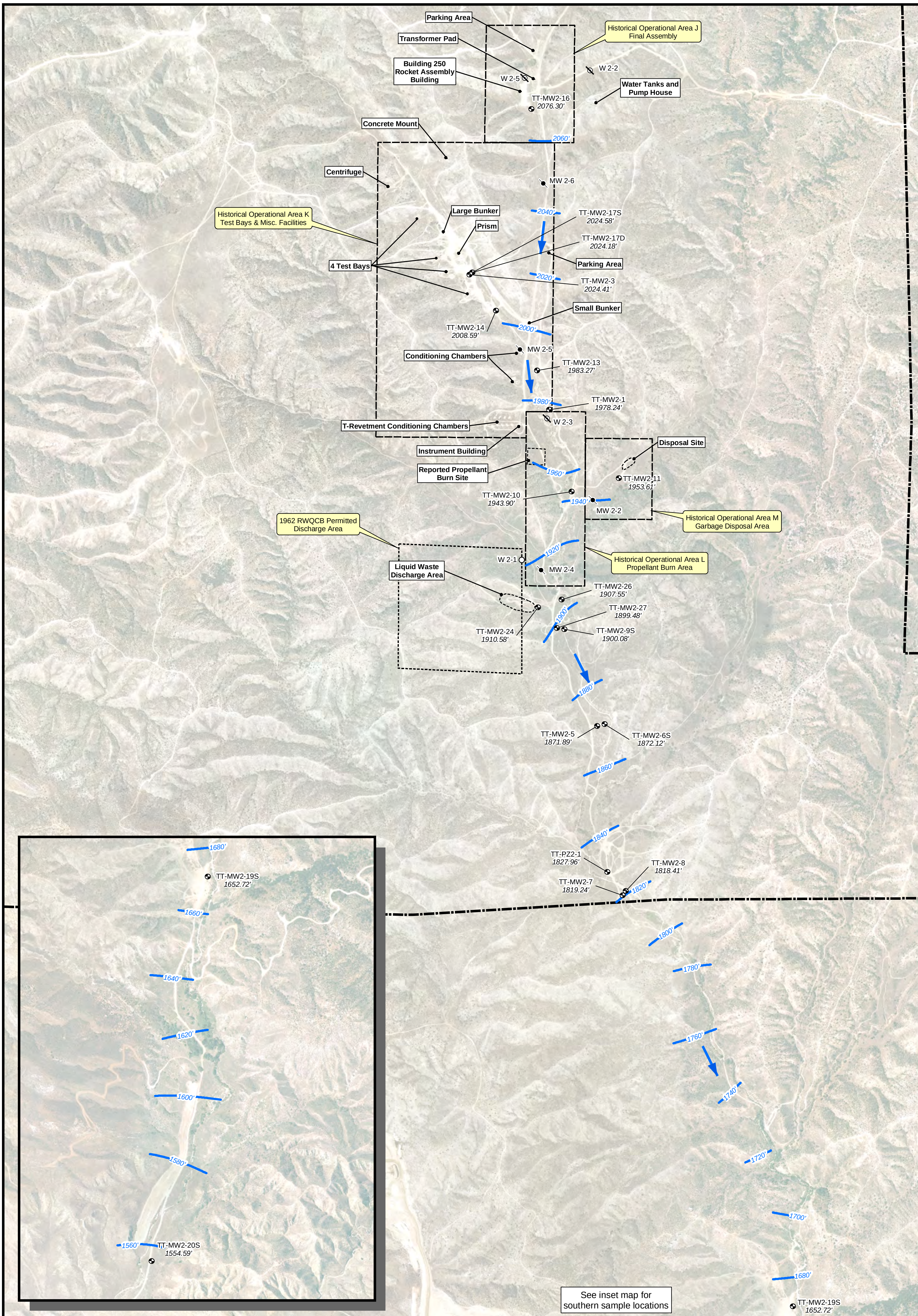

LEGEND

- Monitoring Well Location with Groundwater Elevation (feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Goundwater Elevation Contour
- Groundwater Flow Direction
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

N

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

20-foot groundwater interval.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-3

Fourth Quarter 2008 Groundwater Contours for First Groundwater

TETRA TECH

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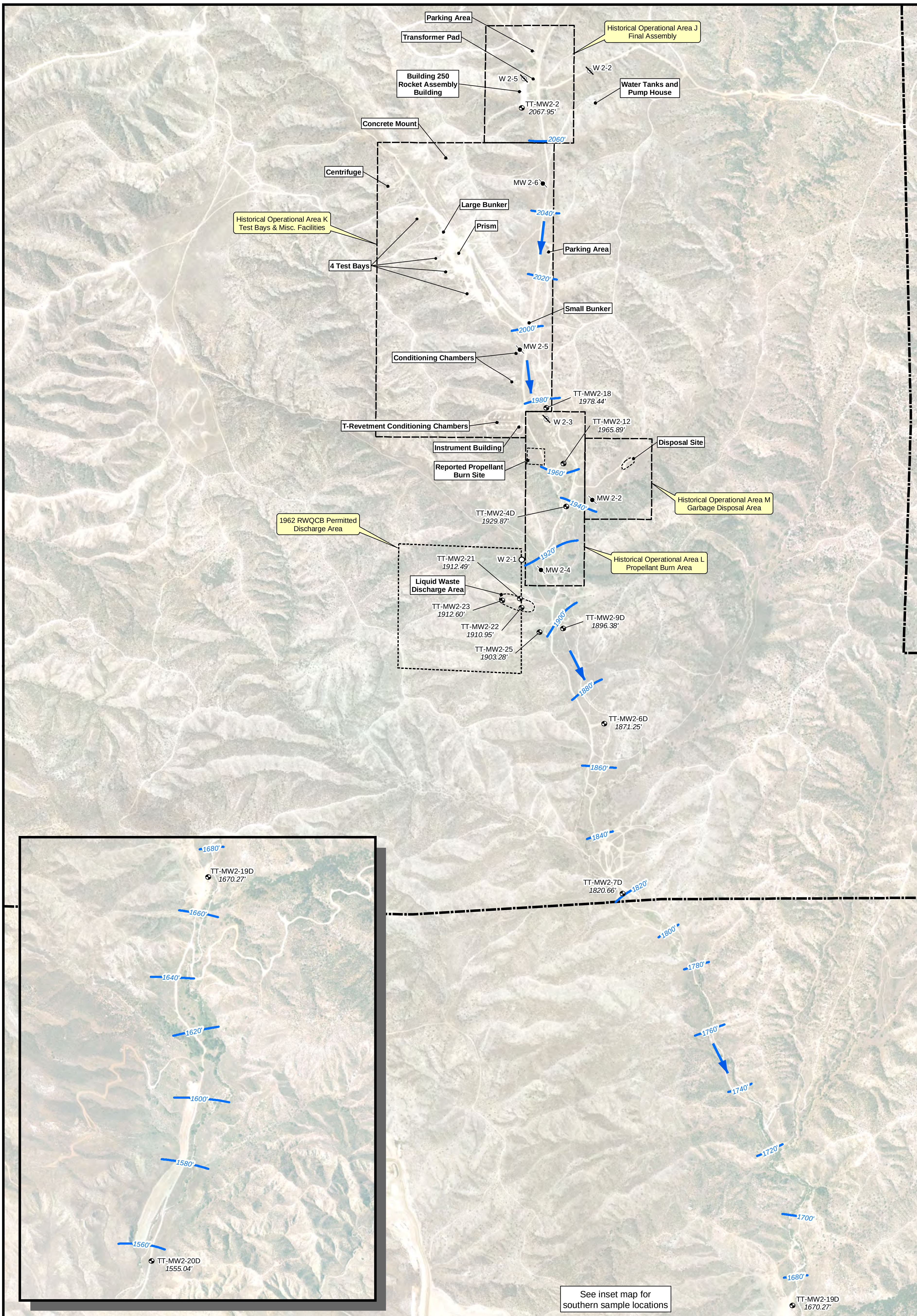

LEGEND

- Monitoring Well Location with Groundwater Elevation (feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000
Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

20-foot groundwater interval.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-4

Fourth Quarter 2008 Groundwater Contours for San Timoteo Formation

TETRA TECH

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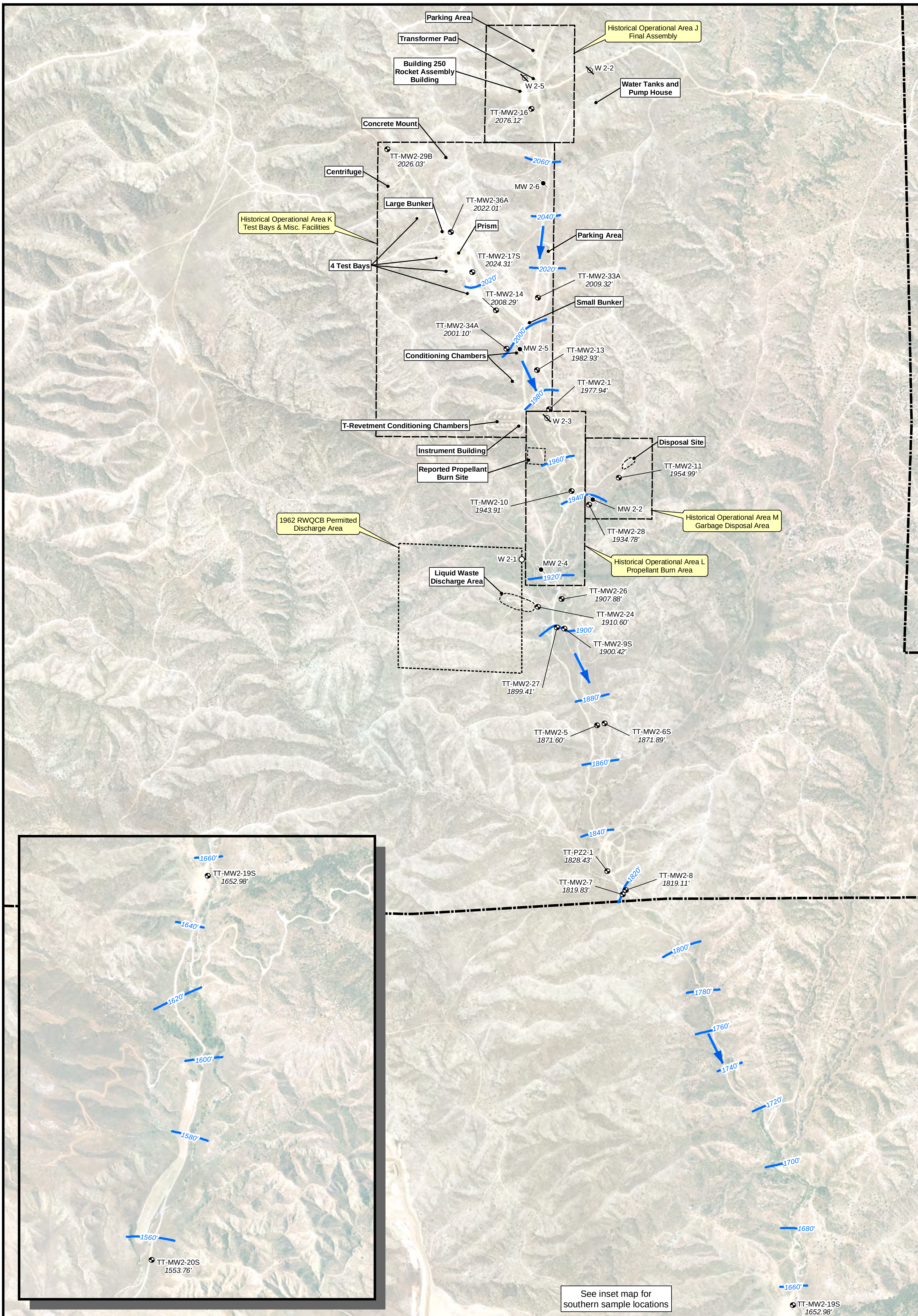

LEGEND

- Monitoring Well Location with Groundwater Elevation (Feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000
Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

20-foot groundwater interval.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-5

First Quarter 2009 Groundwater Contours for First Groundwater

TETRA TECH

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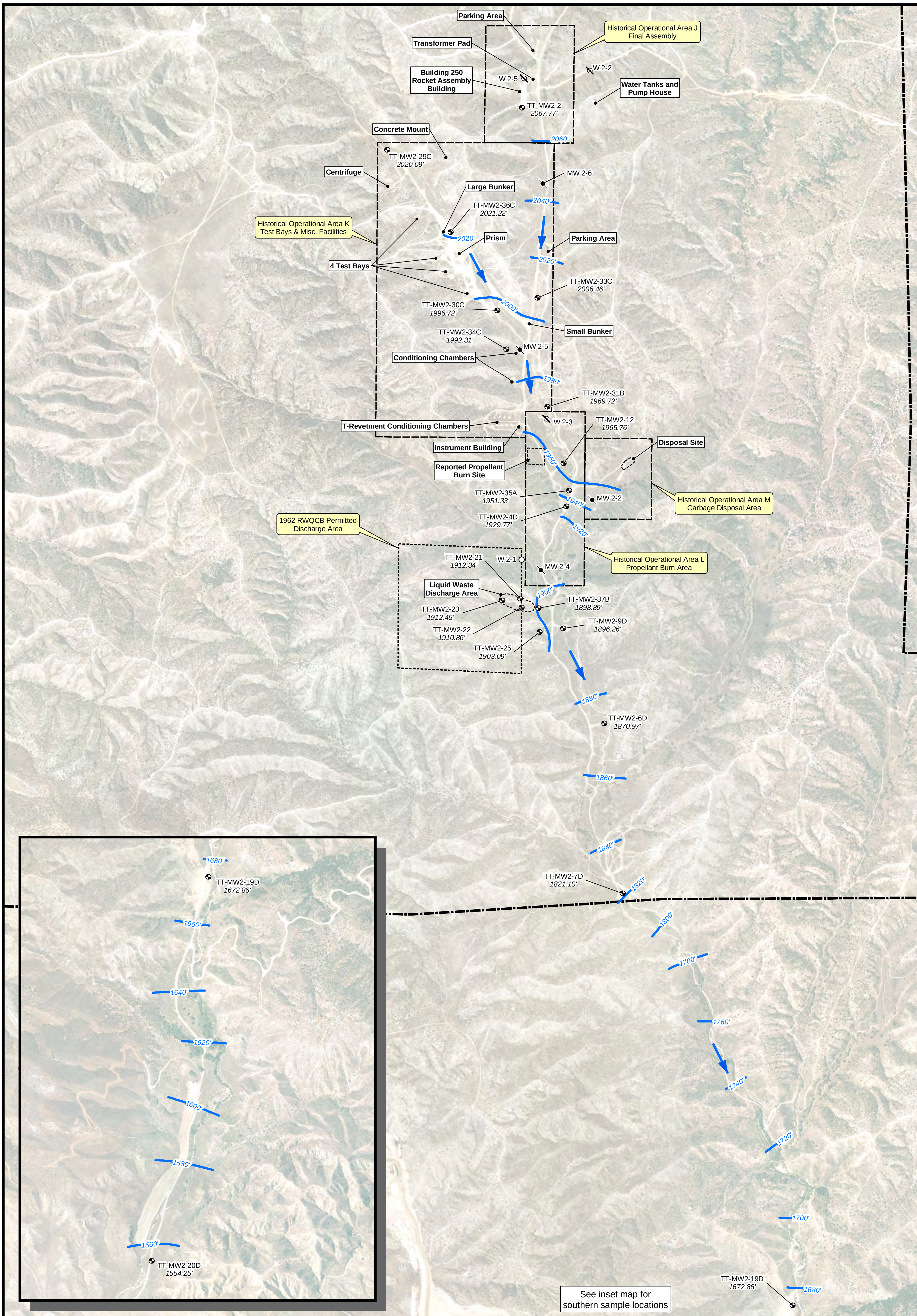


LEGEND

- Monitoring Well Location with Groundwater Elevation (Feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation cContour
- Groundwater Flow Direction
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000
Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

20-foot groundwater interval.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-6

First Quarter 2009 Groundwater Contours for San Timoteo Formation

TETRA TECH

3.3 GROUNDWATER GRADIENTS

The horizontal groundwater gradients calculated between TT-MW2-16 and TT-MW2-6S from the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events for the QAL/wSTF HSU were 0.030 ft/ft. The horizontal groundwater gradients calculated between TT-MW2-2 and TT-MW2-6D for the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events for the STF HSU was 0.029 ft/ft

Vertical groundwater gradients are calculated from individual clusters of wells. Well clusters are used to measure the differences in static water level at different depths within the aquifer. The vertical gradient is a comparison of static water level between wells at different depths within the aquifer and is an indication of the vertical flow, (downward – negative gradient, upward – positive gradient), of groundwater. Vertical groundwater gradients at the Site are generally downward. The vertical gradients range from negative 0.27 to positive 0.18. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-2 and in Appendix E.

Table 3-2 Summary of Horizontal and Vertical Groundwater Gradient

Horizontal Groundwater Gradients (feet / foot), approximating a flowline perpendicular to groundwater contours

-	Overall	Overall
-	STF	QAL/WSTF
-	**TT-MW2-2**	**TT-MW2-16**
	to	to
	TT-MW2-6D	**TT-MW2-6S**
Fourth Quarter (December) 2008	0.029	0.030
First Quarter (March) 2009	0.029	0.030

Vertical Groundwater Gradients (feet / foot)

-	Area J	Area K	Area K	Area L	Southern portion of Site 2	Southern portion of Site 2	Southern portion of Site 2	Former Wolfskill Property	Former Wolfskill Property
deep screen	**TT-MW2-2** (STF)	**TT-MW2-17D** (QAL/WSTF)	**TT-MW2-18** (STF)	**TT-MW2-4D** (STF)	**TT-MW2-9D** (STF)	**TT-MW2-6D** (STF)	**TT-MW2-7D** (STF)	**TT-MW2-19D** (STF)	**TT-MW2-20D** (STF)
shallow screen	**TT-MW2-16** (QAL/WSTF)	**TT-MW2-17S** (QAL/WSTF)	**TT-MW2-1** (QAL / WSTF)	**TT-MW2-4S** (STF)	**TT-MW2-9S** (QAL/WSTF)	**TT-MW2-6S** (QAL/WSTF)	**TT-MW2-7** (QAL/WSTF)	**TT-MW2-19S** (QAL/WSTF)	**TT-MW2-20S** (QAL/WSTF)
Fourth Quarter (December) 2008	-0.1748	-0.0158	0.0059	-0.2612	-0.1377	-0.0456	0.0341	0.1579	0.0106
First Quarter (March) 2009	-0.1751	-0.0171	0.0060	-0.2660	-0.1538	-0.0485	0.0303	0.1787	0.0117

Notes:

STF - San Timoteo Formation

QAL/WSTF - Quaternary Alluvium and weathered San Timoteo Formation

3.4 ANALYTICAL DATA SUMMARY

Groundwater samples collected during the Fourth Quarter 2008 monitoring event were tested for VOCs and perchlorate. VOCs and perchlorate are contaminants of potential concern at the Site. Groundwater samples collected during the First Quarter 2009 monitoring event were tested for VOCs and perchlorate and select wells were sampled for Research Department composition X (RDX) and 1,4-dioxane.

Summaries of validated laboratory analytical results for analytes detected above their respective MDLs during the monitoring events are presented in Tables 3-3 and 3-4. A complete list of the analytes tested along with validated sample results by analytical method are provided in Appendix F. VOC and perchlorate sample results above the published MCL (federal or state, whichever is lower) or DWNL are bolded in Tables 3-3 and 3-4. Tables 3-5 and 3-6 present a summary of validated organic and inorganic analytes detected during the monitoring events. Laboratory analytical data packages, which include all environmental, field QC, and laboratory QC results, are provided in Appendix G. A consolidated laboratory data summary table is presented in Appendix H.

3.4.1 Data Quality Review

The quality control samples were reviewed as described in the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003b). The data for the groundwater sampling activities were contained in 13 analytical data packages generated by EMAX Laboratories Inc. and E. S. Babcock & Sons, Inc (Appendix G). These data were reviewed using the current versions of the National Functional Guidelines for Organic and Inorganic Data Review documents.

Holding times, field blanks, laboratory control samples, method blanks, duplicate environmental samples, spiked samples, and spike recovery data were reviewed. Within each environmental sample the sample specific quality control spike recoveries were examined. These data examinations include comparing statistically calculated control limits to percent recoveries of all spiked analytes and duplicate spiked analytes. Relative Percent Difference (RPD) control limits are compared to actual spiked (MS/MSD) RPD results. Surrogate recoveries were examined for all organic compound analyses and compared to their control limits.

Environmental samples were analyzed by the following methods: Methods E314.0 and E332.0 for Perchlorate, Methods SW8330 and E529.1 for RDX, Method SW8270C M for 1,4-Dioxane, and Method SW8260B for VOCs. Unless discussed below, all data results met required criteria, are of known precision and accuracy, did not require any qualification, and may be used as reported.

Trip blank contamination caused 0.4 percent of the SW8260B data to be qualified for blank contamination. The laboratory analyzed blanks to determine if laboratory or field operations introduced cross contamination into the sampling or analytical process. Analyte detections in the method or field blank indicate detections not native to the environmental sample. Similar detections between the blank and associated environmental samples are qualified with a “B” qualifier. Because the “B” qualified detections were likely caused by laboratory or field contamination, the detected numerical results are considered not usable and the result for the sample analyses should be considered “not detected”.

Method E529.1 had holding time errors that qualified as estimated 100 percent of the total E529.1 data. The method for RDX (E529.1) has an extraction holding time of 7 days from the time the sample is collected. An unforeseen laboratory error caused the extraction to occur 1 day late. A single day holding time violation has a minor effect on the data quality. The data is usable.

Method SW8330 for RDX had a surrogate recovery slightly above the control limit that qualified the 1 sample result as estimated.

All data qualified as estimated are usable for the intended purpose.

Table 3-3 Summary of Detected Validated Organic and Inorganic Analytes - Fourth Quarter 2008

Sample Location	Sample Date	Per chlorate	Benzene	Carbon Disulfide	Chloro methane	Chloro form	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	c-1,2-Dichloro ethene	Methylene Chloride	1,1,2-Trichloro ethane	Trichloro ethene
All results reported in µg/L unless otherwise stated													
WS-1-Top	11/17/2008	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-1-Bottom	11/17/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-1	11/20/2008	**7,530**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-4S	11/14/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-5	11/19/2008	**862**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-6S	11/19/2008	**151**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-6D	11/19/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-7	11/18/2008	**437**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-7D	11/18/2008	<2.5	<0.2	5	0.36 Jq	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2
TT-MW2-8	11/20/2008	**263**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-9S	11/19/2008	**555**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-9D	11/14/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-10	11/14/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-11	11/25/2008	**267**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-12	11/17/2008	1.06 Jq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-13	11/19/2008	**3,360**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-14	12/1/2008	**40,100**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-17S	11/19/2008	**1,610**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-17D	11/25/2008	**18,900**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-18	12/1/2008	**12,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19S	11/18/2008	2.46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19D	11/17/2008	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20S	11/17/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20D	11/17/2008	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-21	11/18/2008	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.9 Bk	<0.2	0.59 Jq
TT-MW2-22	11/25/2008	<0.5	0.66 Jq	0.28 Jq	<0.2	3.8	2.7	**2.4**	**22**	0.38 Jq	4.9	<0.2	**350**
TT-MW2-23	11/17/2008	<0.5	<0.2	0.81 Jq	0.22 Jq	<0.2	<0.2	<0.2	<0.2	<0.2	0.69 BJkq	<0.2	<0.2
TT-MW2-24	11/25/2008	**142,000**	<0.2	<0.2	0.26 Jq	3	0.72 Jq	**0.71 Jq**	1.9	<0.2	<0.5	0.45 Jq	**85**
Method Detection Limit		0.50	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.50	0.20	0.20
MCL (unless noted) / DWNL		6	1	160 (1)	-	-	5	0.5	6	6	5	5	5

Notes: Only analytes positively detected in samples are presented in this table. For a complete list of constituents analyzed, refer to the laboratory data package.

µg/L - Micrograms per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
Bold - MCL or DWNL exceeded.
< # - Method detection limit concentration is shown.

NA - Not analyzed
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
k - The analyte was found in the field blank.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-4 Summary of Detected Validated Organic and Inorganic Analytes - First Quarter 2009

Sample Location	Sample Date	Perchlorate	1,4-Dioxane	RDX	Acetone	Carbon Disulfide
All results reported in µg/L unless otherwise stated						
SW-2	2/16/2009	**42.4**	NA	NA	<5.0	<0.36
SW-3	2/16/2009	<0.5	NA	NA	<5.0	<0.36
SW-5	2/16/2009	2.27	NA	NA	6.7 Jq	0.49 Jq
SW-6	2/16/2009	1.59 Jq	NA	NA	5.7 Jq	0.49 Jq
SW-7	2/16/2009	<0.5	NA	NA	7.6 Jq	0.49 Jq
WS-1 (2)	3/12/2009	0.29	NA	NA	NA	NA
TT-MW2-13	3/11/2009	NA	NA	**0.80 Je**	NA	NA
TT-MW2-19S	3/12/2009	**3.1**	NA	NA	NA	NA
TT-MW2-19D	3/12/2009	<0.071	NA	NA	NA	NA
TT-MW2-20S	3/12/2009	<0.071	NA	NA	NA	NA
TT-MW2-20D	3/12/2009	<0.071	NA	NA	NA	NA
TT-MW2-22	3/20/2009	NA	**35**	NA	NA	NA
TT-MW2-24	5/5/2009	NA	NA	**4.7**	NA	NA
TT- PZ2-1	4/27/2009	NA	NA	NA	<5.0	<0.36
TT- PZ2-1	4/28/2009	**240**	NA	NA	NA	NA
Method Detection Limit		0.071	0.20	0.20	5.00	0.36
MCL (unless noted) / DWNL		6	3 (1)	0.3 (1)	-	160 (1)

Notes: Only analytes positively detected in samples are presented in this table.
For a complete list of constituents analyzed, refer to the laboratory data package.

RDX - Research Department composition X
µg/L - Micrograms per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - DWNL
(2) - Former WS-1-Bottom location
" - " MCL/DWNL not established.
Bold - MCL or DWNL exceeded.
< # - Method detection limit concentration is shown.
NA - Not analyzed
J - The analyte was positively identified, but the concentration is an estimated value.
e - A holding time violation occurred.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-5 Summary Statistics of Validated Organic and Inorganic Analytes Detected Fourth Quarter 2008

Compounds Detected	Total Number of Samples Analyzed (1)	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	Corresponding MCL (unless noted) / DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
Organic Analytes:									
Benzene	5	1	0	1	μg/L	0.66	μg/L	0.66	μg/L
Carbon Disulfide	5	3	0	160 (2)	μg/L	0.28	μg/L	5	μg/L
Chloromethane	5	3	0	-	μg/L	0.22	μg/L	0.36	μg/L
Chloroform	5	2	0	-	μg/L	3	μg/L	3.8	μg/L
1, 1-Dichloroethane	5	2	0	5	μg/L	0.72	μg/L	2.7	μg/L
1, 2-Dichloroethane	5	2	2	0.5	μg/L	0.71	μg/L	2.4	μg/L
1, 1-Dichloroethene	5	2	1	6	μg/L	1.9	μg/L	22	μg/L
cis-1, 2-Dichloroethene	5	1	0	6	μg/L	0.38	μg/L	0.38	μg/L
Methylene Chloride	5	1	0	5	μg/L	4.9	μg/L	4.9	μg/L
1, 1, 2-Trichloroethane	5	1	0	5	μg/L	0.45	μg/L	0.45	μg/L
Trichloroethene	5	3	2	5	μg/L	0.59	μg/L	350	μg/L
Inorganic Analytes:									
Perchlorate	28	15	13	6	μg/L	1.06	μg/L	142,000	μg/L

Notes: Only analytes positively detected in groundwater or surface water samples are presented in this table.
For a complete list of constituents analyzed, refer to the laboratory data package.
(1) - Number of detections exclude sample duplicates, trip blanks, and equipment blanks.
(2) - California Department of Public Health state drinking water notification level.
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health state drinking water notification level.
" - " MCL/DWNL not established.
μg/L - Micrograms per liter.

Table 3-6 Summary Statistics of Validated Organic and Inorganic Analytes Detected First Quarter 2009

Compounds Detected	Total Number of Samples Analyzed (1)	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	Corresponding MCL (unless noted) / DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
Organic Analytes:									
RDX	2	2	2	0.3 (2)	μg/L	0.8	μg/L	4.7	μg/L
1,4-Dioxane	1	1	1	3 (2)	μg/L	35	μg/L	35	μg/L
Acetone	6	3	0	-	μg/L	5.7	μg/L	7.6	μg/L
Carbon Disulfide	6	3	0	160 (2)	μg/L	0.49	μg/L	0.49	μg/L
Inorganic Analytes:									
Perchlorate	11	6	3	6	μg/L	1.59	μg/L	240	μg/L

Notes: Only analytes positively detected in groundwater or surface water samples are presented in this table.
For a complete list of constituents analyzed, refer to the laboratory data package.
(1) - Number of detections exclude sample duplicates, trip blanks, and equipment blanks.
(2) - California Department of PublicHealth state drinking water notification level.
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health state drinking water notification level.
" - " MCL/DWNL not established.
RDX - Research Department composition X
μg/L - Micrograms per liter.

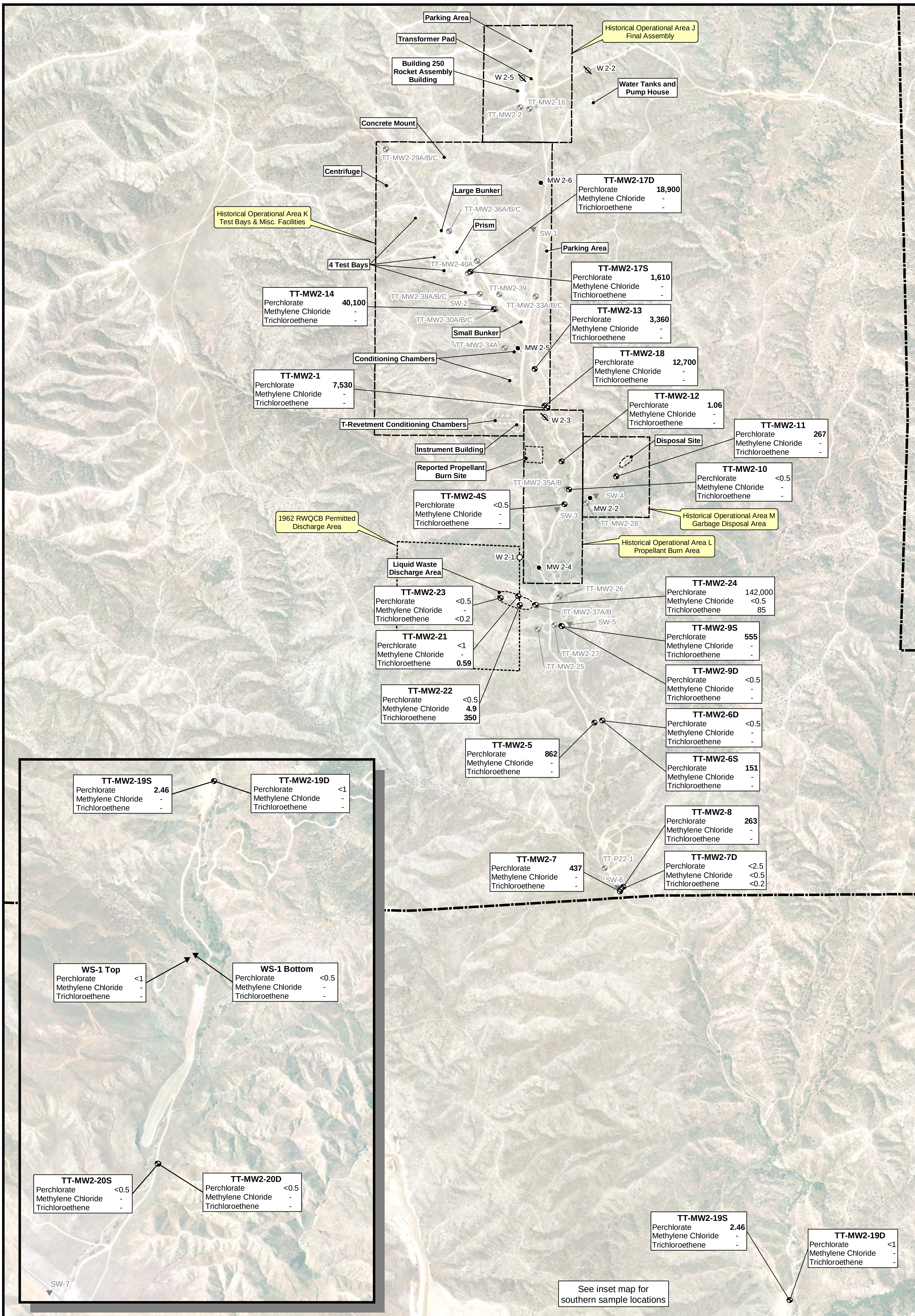
3.5 CHEMICALS OF POTENTIAL CONCERN

COPCs evaluation and trend analysis are performed annually as part of the Second Quarter monitoring event. The analytes detected were screened against the MCLs or DWNLs (if an MCL is not established). The analytes were organized and evaluated in 2 groups, organic and inorganic analytes, and divided into primary and secondary COPCs. Analytical results from the Fourth Quarter 2008 and First Quarter 2009 sampling events are consistent with the COPC list identified from data presented in Second Quarter 2008 (Table 3-7). Laboratory analytical results from the Fourth Quarter 2008 and First Quarter 2009 monitoring events are presented in the following 2 subsections. Data which are B qualified because of association with either laboratory or field contamination is not included in the COPC evaluation. Figures 3-7 and 3-8 present summaries of COPC laboratory results for groundwater samples collected for the Fourth Quarter 2008 and First Quarter 2009.

Table 3-7 Groundwater Chemicals of Potential Concern

Analyte	Classification
Perchlorate	Primary
Trichloroethene	Primary
RDX	Secondary
Notes: RDX - Research Department composition X	

X:\GIS\Lockheed Q408-Q109\COPC_Q408.mxd



LEGEND

- Groundwater Monitoring Well Location
- Surface Water Sampling Location
- Monitoring Well Location (Not Sampled)
- Surface Water Location (Not Sampled)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Note: Bold indicates corresponding MCL exceeded.

Concentrations shown are in micrograms per liter (µg/L)

MCL - Maximum Contaminant Level

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

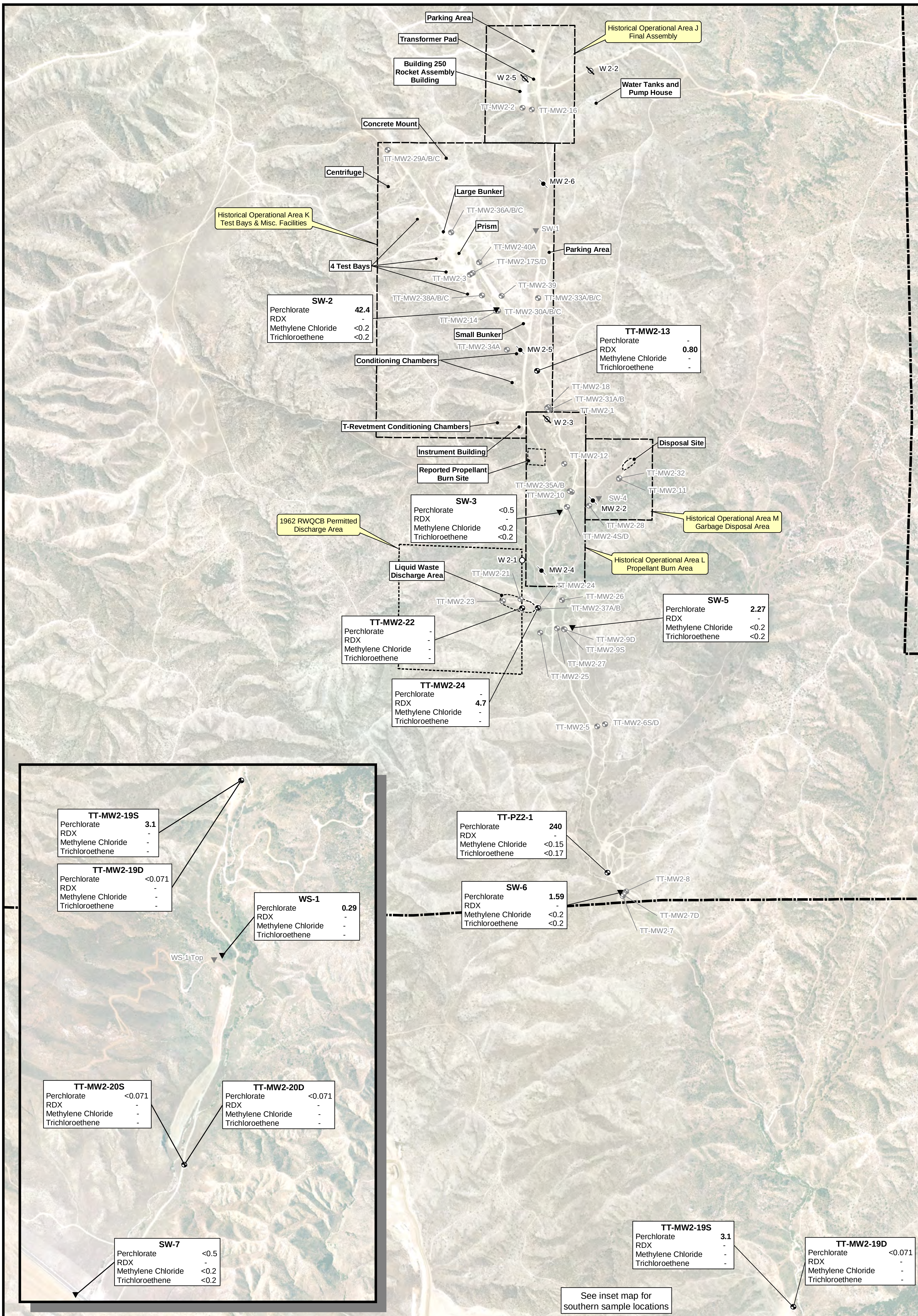
Beaumont Site 2

Figure 3-7

COPC Sampling Results - Fourth Quarter 2008

TETRA TECH

X:\GIS\Lockheed Q408-Q109\COPC_Q109.mxd



LEGEND

- Groundwater Monitoring Well Location
- Surface Water Sampling Location
- Monitoring Well Location (Not Sampled)
- Surface Water Location (Not Sampled)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Note: Bold indicates corresponding MCL exceeded.
Concentrations shown are in micrograms per liter (µg/L)
MCL - Maximum Contaminant Level

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.
Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

Figure 3-8

COPC Sampling Results - First Quarter 2009

TETRA TECH

3.5.1 Organic Analytes

Five organic analytes (1,4-dioxane, 1,2-DCA, 1,1-DCE, RDX, and TCE) were detected above a published MCL or DWNL during the Fourth Quarter 2008 and First Quarter 2009 monitoring events. Tables 3-3 and 3-4 presents a summary of validated organic analyte concentrations reported in groundwater samples collected during the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events respectively.

1,4-dioxane was reported in groundwater samples collected from 1 monitoring well, TT-MW2-22, located in the former Liquid Waste Discharge Area (LWDA) sampled during the First Quarter 2009 monitoring events at a concentration of 35 µg/L. 1,4-dioxane has not previously been detected above the MDL at the Site. The DWNL for 1,4-dioxane is 3 µg/L.

1,2-DCA was reported in groundwater samples collected from 2 monitoring wells, TT-MW2-22 and TT-MW2-24, located in the former LWDA sampled during the Fourth Quarter 2008 monitoring event at concentrations of 2.4 µg/L and 0.71 µg/L respectively. The MCL for 1,2-DCA is 0.5 µg/L.

1,1-DCE was reported in groundwater samples collected from 2 monitoring wells, TT-MW2-22 and TT-MW2-24, located in the former LWDA sampled during the Fourth Quarter 2008 monitoring event at concentrations of 22 µg/L and 1.9 µg/L respectively. The MCL for 1,1-DCE is 6 µg/L.

RDX was reported in groundwater samples collected from 2 monitoring wells in 2 locations during the First Quarter 2009 monitoring event, TT-MW2-13 located in Area K and TT-MW2-24 located in the former LWDA, at concentrations of 0.80 µg/L and 4.7 µg/L respectively. The DWNL for RDX is 0.3 µg/L.

TCE was reported in groundwater samples collected from 3 monitoring wells, TT-MW2-21, TT-MW2-22, and TT-MW2-24, located in the former LWDA sampled during the Fourth Quarter 2008 monitoring event at concentrations ranging from 0.59 to 350 µg/L. The MCL for TCE is 5 µg/L. Time-series graphs of TCE are provided in Appendix I.

Methylene chloride was reported in groundwater samples collected from 1 monitoring well, TT-MW2-22 located in the former LWDA sampled during the Fourth Quarter 2008 monitoring event at a concentration of 4.9 µg/L. Methylene chloride has previously been reported in groundwater samples collected from monitoring well TT-MW2-22 at concentration up to 220 µg/L. The MCL for methylene chloride is 5 µg/L.

Other organic analytes detected at low levels and below their respective MCLs or DWNLs during the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events were acetone, benzene, carbon disulfide, chloromethane, chloroform, 1,1-DCA, cis-1,2 DCE, and 1,1,2-trichloroethane (1,1,2-TCA). None of these compounds exceeded their MCL or DWNL, and generally they were not detected consistently from monitoring event to event.

3.5.2 Organic COPCs

Based on the analysis above and the concentrations detected during previous groundwater monitoring events, TCE and methylene chloride have been identified as primary COPCs at the Site. Based on the limited and relatively low RDX concentrations reported in groundwater samples collected from the Site, RDX is regarded as a secondary COPCs. The remaining 11 organic analtyes were either detected below their respective MCL or DWNL or at relatively low concentrations. Their distribution and concentration in groundwater will continue to be monitored and the results evaluated.

3.5.3 Inorganic Analytes

One inorganic analyte, perchlorate, was detected in groundwater above a published MCL or DWNL. Tables 3-3 and 3-4 present a summary of validated inorganic analyte concentrations reported in groundwater samples collected during the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events.

Perchlorate was reported in groundwater samples collected from 15 of 28 locations sampled during the Fourth Quarter 2008 groundwater monitoring event and 6 of 11 locations sampled during the First Quarter 2009 monitoring event, at concentrations up to 142,000 and 240 µg/L, respectively. The California MCL for perchlorate is 6 µg/L. Time-series graphs of perchlorate are provided in Appendix I.

3.5.4 Inorganic COPCs

Based on the analysis above and the concentrations detected during previous groundwater monitoring events, perchlorate is the only inorganic primary COPC identified at the Site. No secondary COPCs were identified. Metals will continue to be evaluated on an annual basis and as additional monitoring points are added to the network.

3.6 NEW MONITORING WELLS

Thirty three groundwater monitoring wells, TT-MW-25 through TT-MW2-40, were installed between October 2008 and March 2009 as part of the Site 2 Dynamic Site Investigation (DSI). Following completion of the well construction and development activities, as part of the installation process groundwater samples were collected from the newly installed monitoring wells and analyzed for perchlorate and VOCs with select wells analyzed for RDX. A complete description of the monitoring well installation activities and results will be presented in the Site 2 Dynamic Site Investigation Report currently in preparation.

3.7 SURFACE WATER SAMPLING RESULTS

Surface water samples were collected for perchlorate at 2 locations, WS-1-Top and WS-1-Bottom, from a spring on the former Wolfskill property during the Fourth Quarter 2008 monitoring event and from 1 location, WS-1 the former WS-1-Bottom location, during the First Quarter 2009 monitoring event (Figure 2-4). The first sample, WS-1-Top, was collected from a small depression dug at the top section of the spring. The second sample, WS-1-Bottom, was collected at the bottom section of the spring where water flows across the road. During Fourth Quarter 2008 perchlorate was not detected above the MCL in either WS-1-Top or WS-1-Bottom. During First Quarter 2009 perchlorate was not detected above the MCL in WS-1. The MCL for perchlorate is 6 µg/L.

Storm water samples were collected from 5 locations during a storm event on February 16, 2009. Storm water samples were tested for VOCs, and perchlorate. Perchlorate was detected in 3 samples at concentrations ranging from 1.59 µg/L to 42.4 µg/L. No other surface water samples were collected during this reporting period.

Table 3-8 presents a summary of validated organic and inorganic analyte concentrations reported in surface water and storm water samples collected during the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events.

Table 3-8 Summary of Detected Organic and Inorganic Analytes in Surface Water and Storm Water

Sample Name	Sample Date	Perchlorate	Acetone
All results reported in µg/L unless otherwise stated			
SW-2	2/16/2009	42.4	<5
SW-3	2/16/2009	<0.5	<5
SW-5	2/16/2009	2.27	6.7 Jq
SW-6	2/16/2009	1.59 Jq	5.7 Jq
SW-7	2/16/2009	<0.5	7.6 Jq
WS-1-Top	11/17/2008	<0.5	NA
WS-1-Bottom	11/17/2008	<1	NA
WS-1 (1)	3/12/2009	0.29	NA
Method Detection Limit		0.05	5
MCL (unless noted) / DWNL		6	-

Notes:
Only analytes positively detected in samples are presented in this table.
For a complete list of constituents analyzed, refer to the laboratory data package.
µg/L - Micrograms per liter
MCL - California Department of Public Health Maximum Contaminant Level.
DWNL - California Department of Public Health drinking water notification level.
(1) - Former WS-1-Bottom location
" - " MCL/DWNL not established.
Bold – MCL or DWNL exceeded.
< # - Method detection limit concentration is shown.
NA - Not analyzed
J - The analyte was positively identified, but the concentration is an estimated value.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

3.8 HABITAT CONSERVATION

Consistent with the U.S. Fish and Wildlife Service (USFWS) approved HCP (USFWS, 2005) and subsequent clarifications (LMC, 2006a and 2006b) of the HCP describing environmental activities proposed at the Site, all field activities were performed under the supervision of a Section 10A permitted or sub-permitted biologist who monitored each work location. Groundwater sampling activities were conducted with light duty vehicles and, as specified in the Low Affect HCP, do not require biological monitoring. No impact to SKR occurred during the performance of the field activities related to the Fourth Quarter 2008 and First Quarter 2009 monitoring events.

4.0 SUMMARY AND CONCLUSIONS

This section summarizes the results of the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events. During the Fourth Quarter 2008 monitoring event 33 monitoring well locations and 1 piezometer were measured for groundwater levels and 26 monitoring wells and 2 surface water locations were sampled for groundwater quality. During the First Quarter 2009 monitoring event 56 monitoring well locations and 1 piezometer were measured for groundwater levels and 8 monitoring wells, 1 surface water locations, and 5 storm water locations were sampled for groundwater quality.

4.1 GROUNDWATER ELEVATION AND FLOW

During the Fourth Quarter 2008 and First Quarter 2009 monitoring events, depth to water at the Site ranged from approximately 61 feet bgs (elevation of 2,076 feet msl) upgradient in the northern most well to 18 feet bgs (elevation of 1,818 feet msl) downgradient in the southern most well.

Based on the measured groundwater elevations, the current CSM, and the southward sloping topography at the Site, groundwater flow in the QAL/wSTF and STF HSUs appears to be southerly and generally follow the topography of Laborde Canyon. Groundwater flow will be refined as additional data are acquired.

Generally, groundwater elevation at the Site is relatively stable and demonstrated a limited seasonal rise and fall. The exception is the shallow wells near the property boundary that demonstrate stronger seasonal fluctuations. There are limited data, but the overall long term trend appears to correspond to the long term precipitation pattern.

4.1.1 Groundwater Gradients

Horizontal groundwater gradients across the Site are relatively constant. The horizontal groundwater gradients calculated between TT-MW2-16 and TT-MW2-6S from the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events for the QAL/wSTF HSU were 0.030 ft/ft. The horizontal groundwater gradients calculated between TT-MW2-2 and TT-MW2-6D for the Fourth Quarter 2008 and First Quarter 2009 groundwater monitoring events for the STF HSU was 0.029 ft/ft.

Generally the vertical gradients are downward on the Site and upward from the Site boundary south. The vertical gradients range from negative 0.27 to positive 0.18. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-2 and in Appendix E.

4.2 WATER QUALITY MONITORING

Groundwater samples collected during the Fourth Quarter 2008 and First Quarter 2009 monitoring events were tested for VOCs and perchlorate. Select wells were tested for 1,4 dioxane and RDX. Based on the historical operations at the Site and groundwater monitoring results, perchlorate TCE, and methylene chloride were identified as a primary COPCs; and RDX was identified as a secondary COPC.

Historically perchlorate has not been detected in the groundwater above the MCL (6.0 µg/L) in Area J. In Area K, perchlorate in the groundwater was detected at concentrations ranging from 1,610 to 40,100 µg/L during Fourth Quarter 2008. Previously perchlorate has been detected as high as 79,300 µg/L. A source of perchlorate was identified in Area K. In Area L, downgradient of both Areas J and K, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 1.06 µg/L during Fourth Quarter 2008. Previously perchlorate has been detected as high as 9.98 µg/L. There are currently no indications that a source of perchlorate is present in Area L; the perchlorate detected in the groundwater in this Area appears to have originated in Area K. In Area M, the Garbage Disposal area, perchlorate in the groundwater was detected at a concentration of 267 µg/L during Fourth Quarter 2008. Previously perchlorate has been detected as high as 469 µg/L. In the former LWDA, downgradient of the operational areas (areas J, K, L, and M), perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 142,000 µg/L during Fourth Quarter 2008. Previously perchlorate has been detected as high as 158,000 µg/L which is the highest concentration detected at the Site. In the lower section of Laborde Canyon, downgradient of the operational areas and the former LWDA, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 862 µg/L during Fourth Quarter 2008. Previously perchlorate has been detected as high as 1,070 µg/L in the lower section of Laborde Canyon and as high as 519 µg/L at the southern Site boundary. On the former Wolfskill property, south of the southern Site boundary, perchlorate has been detected in TT-MW1-19S during the Fourth Quarter 2008 and First Quarter 2009 monitoring events at concentrations of 2.46 µg/L and 3.1 µg/L respectively. Perchlorate has not been detected above the MDL in other wells located on the former Wolfskill property.

TCE was reported in groundwater samples collected from monitoring wells TT-MW2-21, TT-MW2-22, and TT-MW2-24 located in the former LWDA at concentrations of 0.59, 350, and 85 µg/L, respectively during the Fourth Quarter 2008. The TCE MCL is 5 µg/L. Additionally, TCE has been previously detected at concentrations over the MCL in areas K and M. Based on the data available at this time, the extent of the TCE plumes in groundwater appear to be isolated to 3 small areas, and it does not extend off Site.

Historically methylene chloride has been reported in groundwater samples collected from TT-MW2-14 and TT-MW2-22 located in area K and the former LWDA at concentrations exceeding the MCL of 5 µg/L. Methylene chloride concentrations initially have ranged as high as 380 µg/L and 220 µg/L but have declined steadily and are now below the MCL. Repeated detections seems to indicate its presence is not spurious or related to undetected laboratory cross-contamination. Based on the data available at this time, the extent of the methylene chloride plumes in groundwater appear to be isolated to 2 small areas, and it does not extend off Site.

Historically RDX has been reported in the groundwater samples from monitoring wells TT-MW2-1 and TT-MW2-13 in Areas K and L at concentrations exceeding the DWNL of 0.3 µg/L. RDX concentrations in these wells have ranged from 0.28 µg/L to 1.6 µg/L with the most recent detections below the MDL and 0.80 in TT-MW2-1 and TT-MW2-13 respectively. Additional sampling for RDX has been conducted in monitoring wells located upgradient, downgradient, and in wells screened in a deeper interval in comparison to TT-MW2-1 and TT-MW2-13 and has not been detected above the MDL. TT-MW2-24, located at the former Liquid Waste Discharge Area, was tested for RDX during First Quarter 2009. RDX was detected at a concentration of 4.7 µg/L. RDX was initially tested for as part of a screening for emerging contaminants. The origin of the RDX is unknown. Based on the data available at this time, the extent of the RDX plume in groundwater appears to be isolated to these small areas and does not extend off-Site.

4.3 GROUNDWATER MONITORING PROGRAM AND THE GROUNDWATER QUALITY MONITORING NETWORK

Eighteen quarters of water quality monitoring have been conducted at the Site since the September 2004 well installation activities. Groundwater samples have been routinely analyzed for VOCs and perchlorate. Selected testing for CAM 17 metals, general minerals, 1,4-dioxane, RDX, NDMA, 1,2,3-TCP and hexavalent chromium has also been performed. A groundwater monitoring sampling and analysis plan (SAP) was prepared to optimize and better define the GMP at the Site (Tetra Tech, 2007b). In concurrence with the DTSC, groundwater monitoring will be performed in accordance with the SAP.

Perchlorate, TCE, and methylene chloride have been identified as primary COPCs. All monitored wells will be tested for perchlorate semiannually, and select wells will be sampled for VOCs annually. Because of the detection of 1,4-dioxane in TT-MW2 22, located in the former LWDA, additional testing for 1,4-dioxane in the monitoring wells located in, and downgradient of, the former LWDA is proposed. Because of the continued detection of RDX above the MCL in TT-MW2-13 and the recent detection of RDX in TT-MW2 24 sampling for RDX will continue to be conducted annually in monitoring wells TT-MW2-1, TT-MW2-13, and TT-MW2-24.

Because of previous detections of arsenic above the MCL, unfiltered metals will be tested for in all monitored wells annually until background levels for metals can be determined. Filtered metals will be collected for ecological risk assessment in water table monitoring wells where the water level is less than 25 feet below ground surface, or where the well screen is deeper than 25 feet below ground surface.

The analytical scheme is evaluated annually during the Second Quarter of each year and changes may be proposed to accommodate expanded Site knowledge or changing Site conditions. The classifications of the wells in the network and the corresponding sampling frequency is also be evaluated annually during the Second Quarter of each year and modified to accommodate expanded Site knowledge or changing Site conditions.

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6.0 ACRONYMS AND ABBREVIATIONS

ARCH	air rotary casing hammer
bgs	below ground surface
btoc	below top of casing
BOS	bottom of screen
CAM	California Assessment Manual
CDHS	California Department of Health Services
COPCs	chemical(s) of potential concern
CSM	Conceptual Site Model
DTSC	Department of Toxic Substances Control
DWNL	drinking water notification level
EC	electrical conductivity
EPA	United States Environmental Protection Agency
ft/ft	feet per foot
ft/day	feet per day
GCR	Grand Central Rocket Company
GMP	Groundwater Monitoring Program
HCP	Habitat Conservation Plan
HSA	hollow stem auger
HSUs	hydrostratigraphic units
K	hydraulic conductivity.
LAC	Lockheed Aircraft Corporation
LEBs	Lockheed equipment blanks
LMC	Lockheed Martin Corporation
LPC	Lockheed Propulsion Company
LR	Linear Regression
LTBs	Lockheed trip blanks
MW	monitoring well
MCLs	maximum contaminant levels
MDLs	method detection limits

mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
µg/L	micrograms/liter
NA	not applicable
NDMA	N-nitrosodimethylamine
NWS	National Weather Service
PW	production well
PVC	polyvinyl chloride
PZ	piezometer
QAL	Quaternary alluvium
QA/QC	quality assurance/quality control
RDX	Research Department composition X
SAP	sampling and analysis plan
SKR	Stephens' Kangaroo rat
SS	stainless steel
STF	San Timoteo formation
SVOCs	semi-volatile organic compounds
TCE	trichloroethene
1,2,3-TCP	1,2,3-trichloropropane
TOC	top of casing
TOS	top of screen
Unk.	unknown
u-DMH	unsymmetrical dimethyl hydrazine
U.S.	United States
USFWS	United States Fish and Wildlife Service
VOCs	volatile organic compounds
WCA	West Coast Analytical Services, Inc.
wSTF	weathered San Timoteo formation