Revised

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

Prepared for:

LOCKHEED MARTIN

Prepared by:

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LOCKHEED MARTIN

May 11, 2009

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

Subject: Submittal of Final *Semiannual Groundwater Monitoring Report Second Quarter 2008 and Third Quarter 2008 Lockheed Martin Corporation, Beaumont Site 2*

Dear Mr. Zogaib:

Please find enclosed two (2) CDs containing the entire report with Figures 1-2, 2-1, 2-2, 2-3, 3-7, and 3-9 revised consistent with the DTSC comment provided with the conditional approval letter dated May 6, 2009; also enclosed is one (1) paper set of revised figures, consistent with your approval of submission of change pages provided by email of May 7, 2009.

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

Sincerely,

Denise Kato
Remediation Analyst Senior Staff

Enclosures

Copy with Enc:
Beaumont Library (1 pdf)
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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LOCKHEED MARTIN

March 30, 2009

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

Subject: Submittal of Final *Semiannual Groundwater Monitoring Report Second Quarter 2008 and Third Quarter 2008 Lockheed Martin Corporation, Beaumont Site 2*

Dear Mr. Zogaib:

Please find enclosed 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 Second Quarter 2008 and Third Quarter 2008 Lockheed Martin Corporation, Beaumont Site 2 Beaumont, California*.

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

Sincerely,

Denise Kato
Remediation Analyst Senior Staff

Enclosures

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Beaumont Library (1 pdf)
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BUR065 Beau 2 Transmittal of Q2 & Q3 2008 GWMR

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

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 Second Quarter 2008 and Third Quarter 2008 groundwater quality monitoring activities of the Beaumont Site 2 (Site) Groundwater Monitoring Program (GMP). Groundwater monitoring is done in accordance with the approved Groundwater Sampling and Analysis Plan (SAP) (Tetra Tech, 2007b).

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:

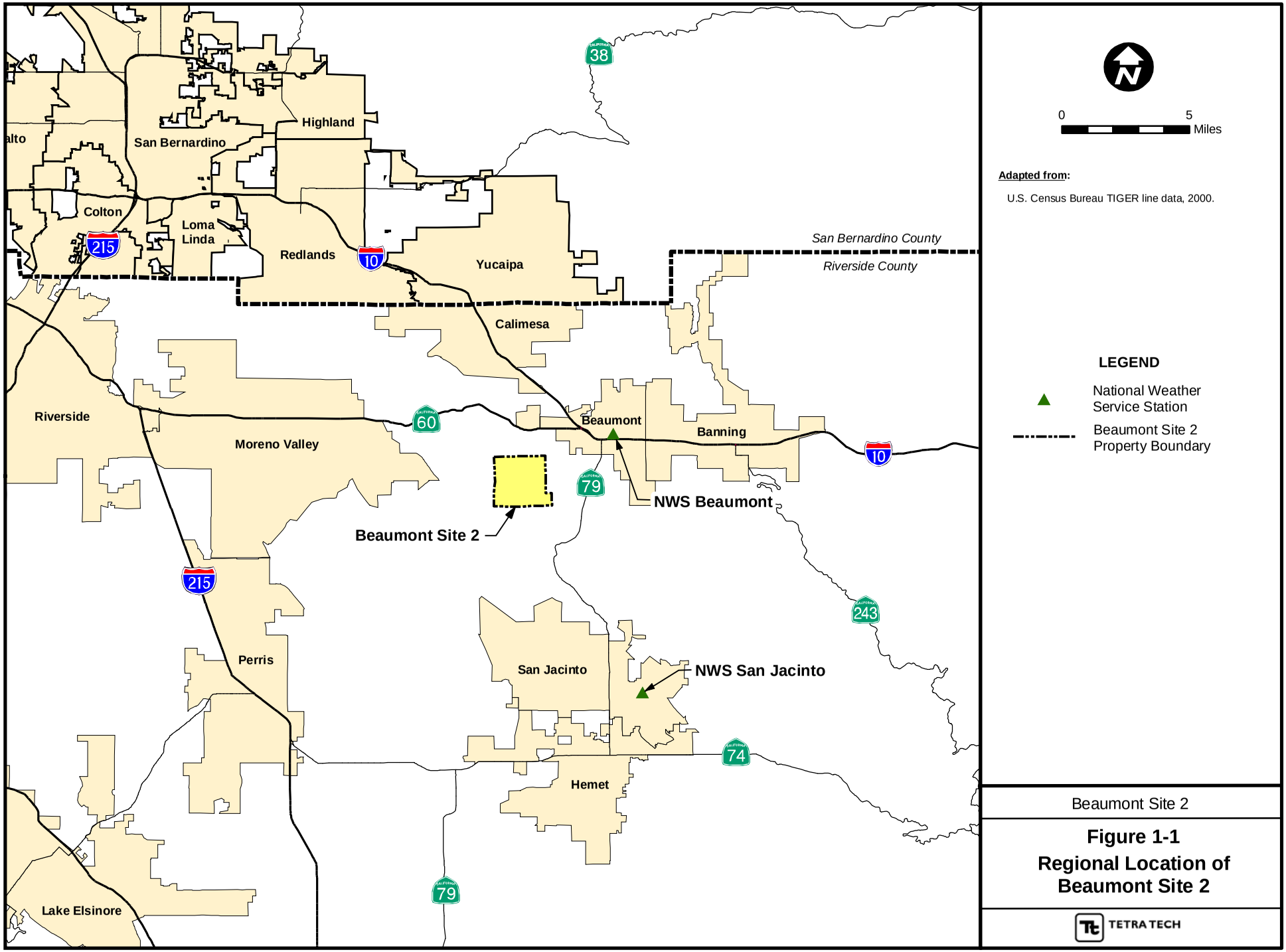
- Briefly summarize the Site history;
- Document the water quality monitoring procedures and results;
- Analyze and evaluate the water quality monitoring data generated; and
- Re-evaluate the current Site GMP.

This Report is organized into the following sections: 1) Introduction, 2) Summary of Monitoring Activities, 3) Groundwater Monitoring results, 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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38
Highland
San Bernardino
alto
Colton
Loma Linda
215
Redlands
10
Yucaipa
San Bernardino County
Riverside County
Calimesa
Riverside
60
Moreno Valley
Beaumont
Banning
10
79
NWS Beaumont
Beaumont Site 2
215
243
Perris
San Jacinto
NWS San Jacinto
74
Hemet
79
Lake Elsinore
0
5
Miles
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
TETRA TECH

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 Health Services 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 Health Maximum Contaminant Level (MCL) of 6 µg/L. Based on the detection of perchlorate in the groundwater sample collected, the DTSC reopened the Site for further assessment.

Four (4) 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 four test bays and two 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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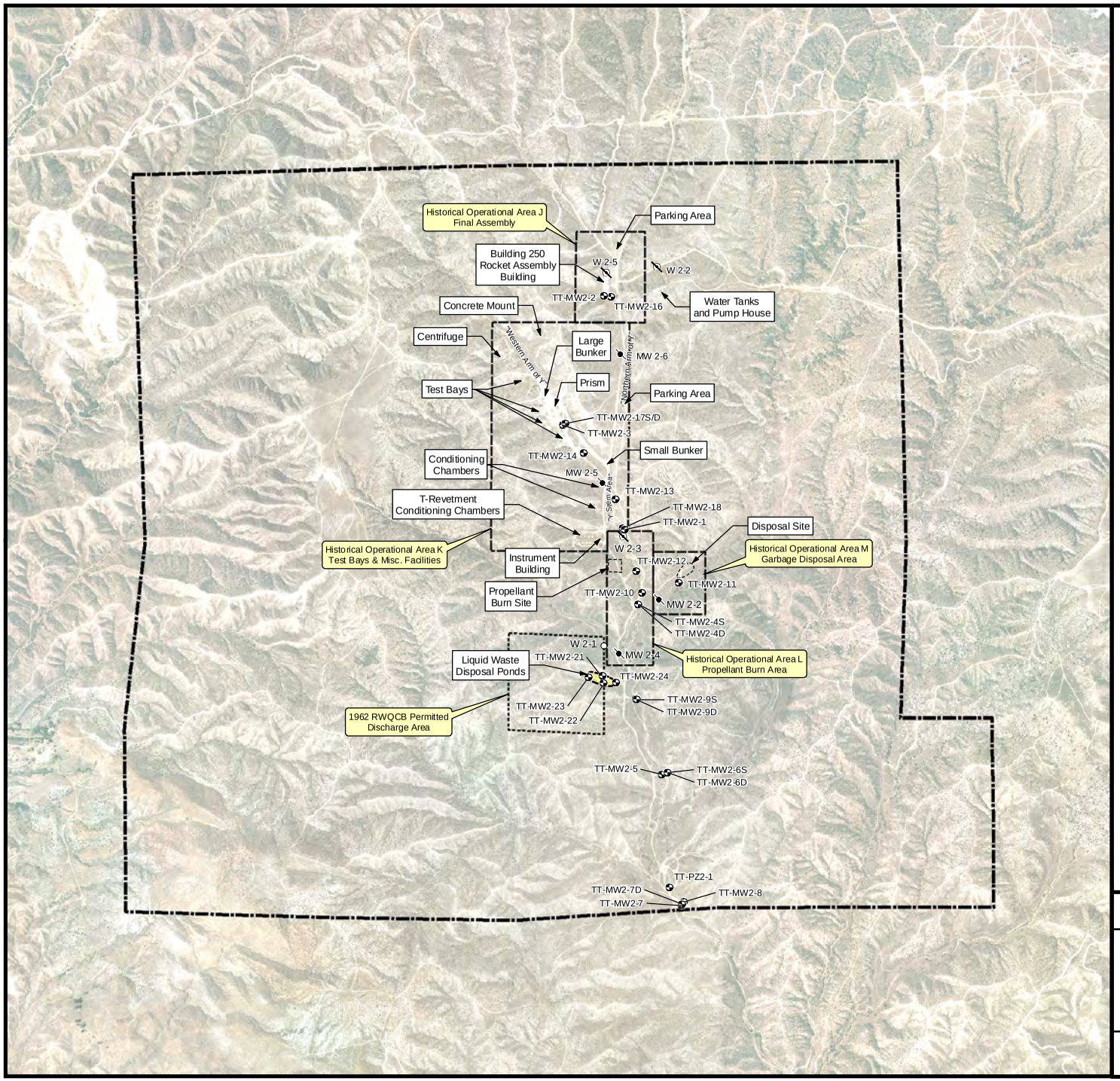

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Adapted from: March 2007 aerial photograph.

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

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Figure 1-2
Historical Operational Areas and Site Features

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Previously, only three test bays were known; however, a former employee reported during a recent interview that a fourth test bay [located north of the other three 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 three 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 Second Quarter 2008 and Third Quarter 2008 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 Second Quarter 2008 groundwater level measurements were collected from 28 monitoring wells and one (1) piezometer on May 15, 2008. The Third Quarter 2008 groundwater level measurements were collected from 30 monitoring wells and one (1) piezometer on August 11, 2008. 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 one 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 2nd and 4th quarter of each year. In addition to the quarterly and semi annual wells, the annual event includes background wells and takes place during the 2nd 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. Second Quarter 2008 and Third Quarter 2008 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. During the Second Quarter 2008 monitoring event 26 groundwater samples and two (2) surface water samples were collected between May 20 and May 29, 2008. During the Third Quarter 2008 monitoring event nine (9) groundwater samples and two (2) surface water samples were collected between August 26 and September 2, 2008. Table 2-1 and 2-2 lists the wells monitored for the Second Quarter 2008 and Third Quarter 2008 monitoring events, analytical methods, sampling dates, and Quality Assurance/Quality Control (QA/QC) samples collected. 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 SAP. Figures 2-2 and 2-3 illustrate the well locations sampled.

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 one (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 double valve sampling pumps. Dedicated double valve sampling pumps are installed in all of the monitoring wells on the Site with the exception of TT-MW2-3, where a portable bladder pump is used, and TT-MW2-19S which was hand bailed and sampled with a disposable bailer.

For the Second Quarter 2008 and Third Quarter 2008 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., a state-accredited analytical laboratory, 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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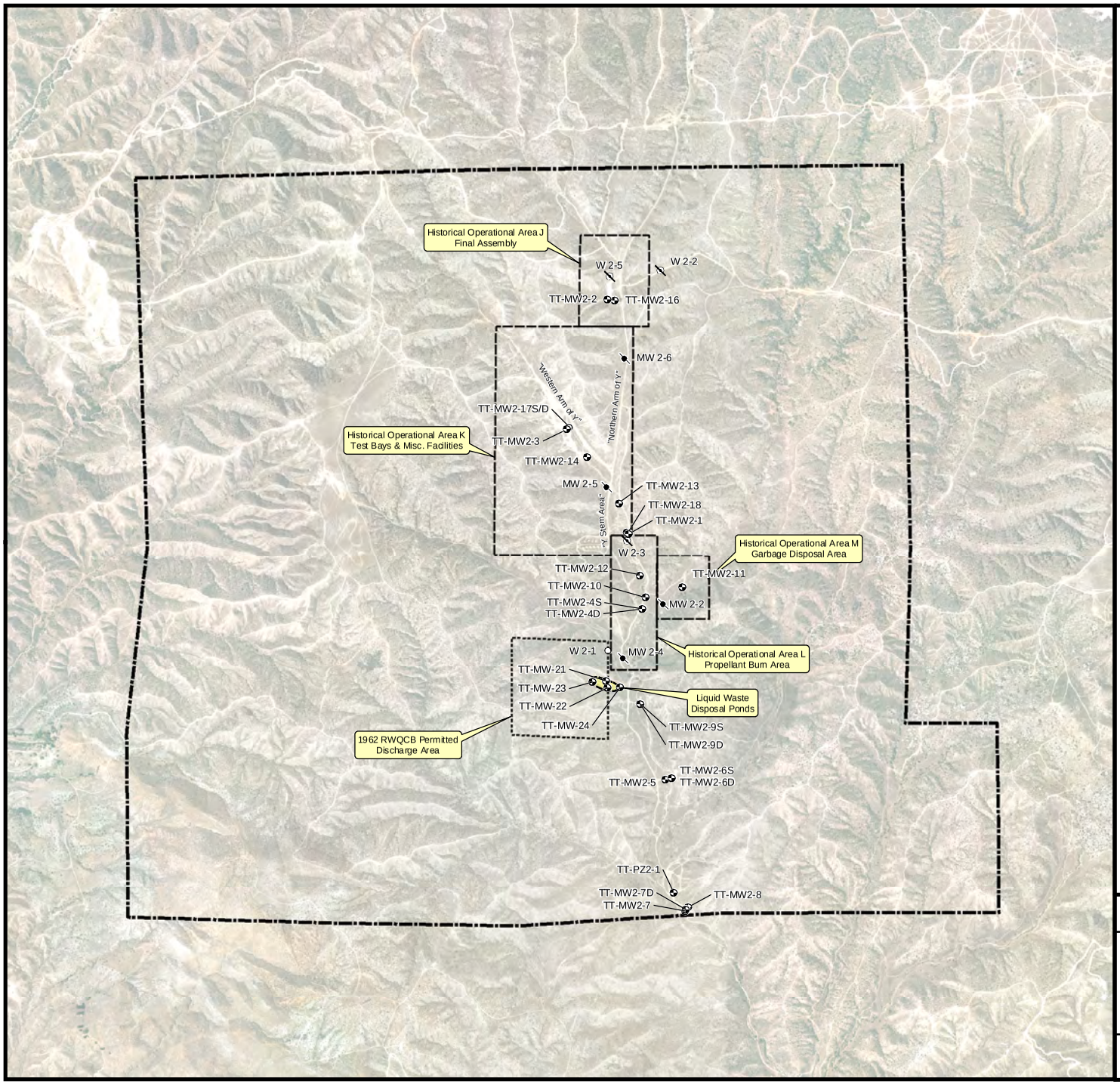

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Adapted from: March 2007 aerial photograph.

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

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Figure 2-1
Site Map

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

Monitoring Well Location	Sample Date	VOCs (EPA 8260B)	Perchlorate (EPA 314.0)	Title 22 Metals Total and Dissolved (SW6010B/ 7470)	NDMA (EPA 1625 B)	RDX (SW 8330 A)	Comments and QA /QC Samples
WS-1-Top	05/20/08	-	X	-	-	-	
WS-1-Bottom	07/15/08	-	X	-	-	-	
TT-MW2-1	05/27/08	X	X	X	-	X	
TT-MW2-2	05/20/08	X	X	X	-	-	
TT-MW2-4S	05/21/08	X	X	X	-	-	
TT-MW2-5	05/23/08	X	X	X	-	-	
TT-MW2-6S	05/22/08	X	X	X	-	-	
TT-MW2-6D	05/22/08	X	X	X	-	-	
TT-MW2-7	05/23/08	X	X	X	-	-	
TT-MW2-7D	05/22/08	X	X	X	-	-	
TT-MW2-8	05/23/08	X	X	X	-	-	
TT-MW2-9S	05/23/08	X	X	X	-	-	
TT-MW2-9D	05/21/08	X	X	X	-	-	
TT-MW2-10	05/21/08	X	X	X	-	X	
TT-MW2-11	05/28/08	X	X	X	X	-	MS/MSD - Duplicate
TT-MW2-12	05/22/08	X	X	X	X	-	
TT-MW2-13	05/27/08	X	X	X	-	X	MS/MSD - Duplicate
TT-MW2-14	05/28/08	X	X	X	X	X	
TT-MW2-16	05/20/08	X	X	X	-	X	Duplicate
TT-MW2-17S	05/27/08	X	X	X	-	-	
TT-MW2-17D	05/28/08	X	X	X	-	-	
TT-MW2-18	05/27/08	X	X	X	-	X	
TT-MW2-20S	05/20/08	-	X	-	-	-	
TT-MW2-20D	05/20/08	-	X	-	-	-	
TT-MW2-21	05/21/08	X	X	X	-	-	
TT-MW2-22	05/28/08	X	X	X	-	-	
TT-MW2-23	05/21/08	X	X	X	-	-	
TT-MW2-24	05/29/08	X	X	X	-	-	
Second 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
NDMA- N-nitrosodimethylamine
RDX- Royal Demolition Explosives
MS / MSD- Matrix Spike / Matrix Spike Duplicate.

Table 2-2 Sampling Schedule and Analysis Method - Third Quarter 2008

Monitoring Well Location	Sample Date	VOCs (EPA 8260B)	Perchlorate (EPA 314.0)	General Minerals Parameters (various methods)	Comments and QA /QC Samples
WS-1-Top	08/27/08	-	X	-	
WS-1-Bottom	08/27/08	-	X	-	
TT-MW2-7D	08/26/08	X	X	X	
TT-MW2-19D	08/27/08	-	X	-	Duplicate
TT-MW2-19S	09/02/08	-	X	-	
TT-MW2-20D	08/27/08	-	X	-	
TT-MW2-20S	08/27/08	-	X	-	
TT-MW2-21	08/26/08	X	X	X	
TT-MW2-22	08/26/08	X	X	X	
TT-MW2-23	08/26/08	X	X	X	MS/MSD
TT-MW2-24	08/26/08	X	X	X	Duplicate
			Third Quarter 2008: Total Sample Locations:		11
			Total Samples Collected:		11

Notes: EPA - United States Environmental Protection Agency.
QA / QC - Quality Assurance / Quality Control.
VOCs - Volatile Organic Compounds
MS / MSD- Matrix Spike / Matrix Spike Duplicate.

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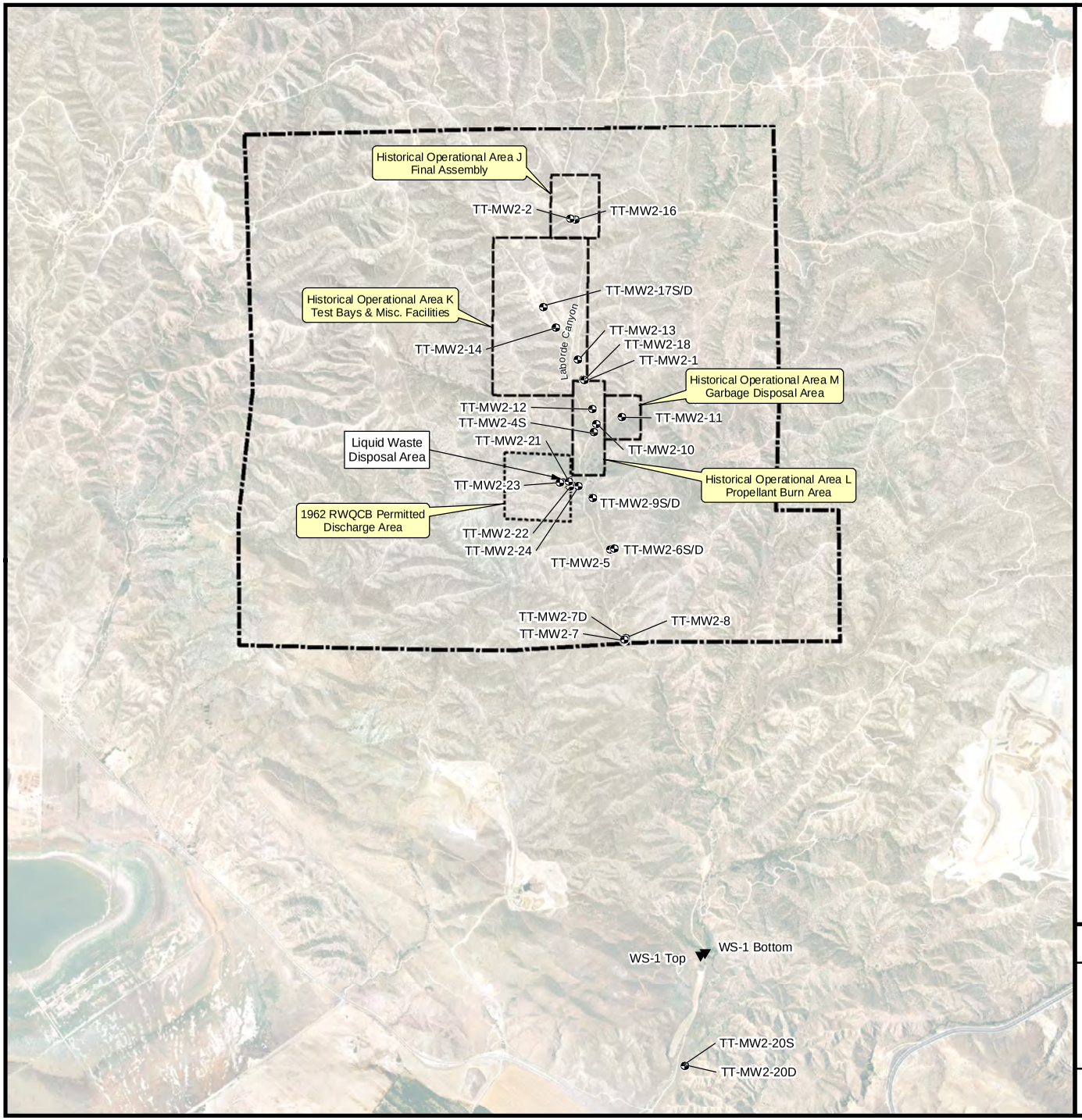

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Feet

Adapted from: April 2007 aerial photograph.

LEGEND

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

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

Beaumont Site 2

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Figure 2-2
Second Quarter 2008
Sample Locations

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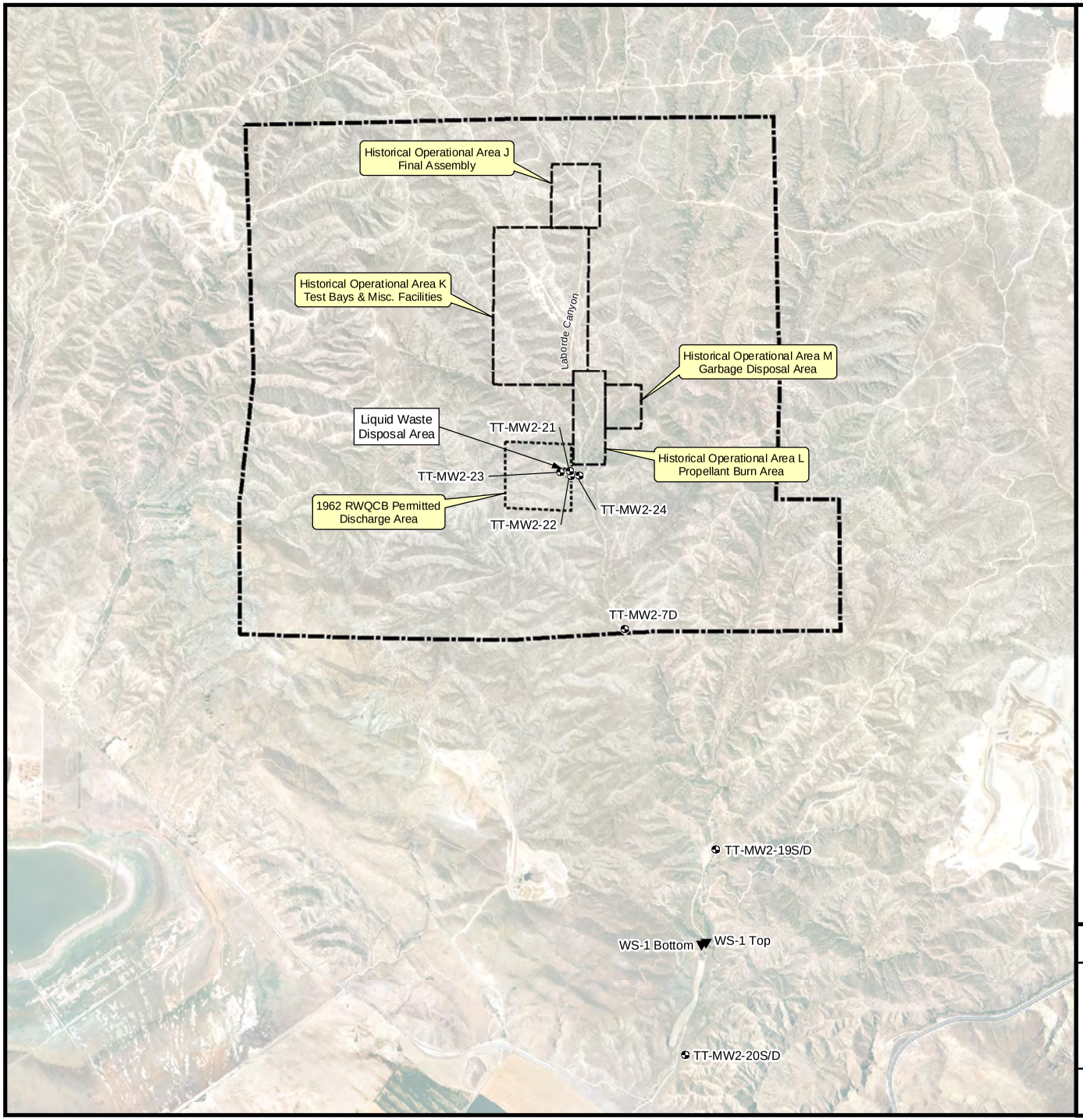

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Adapted from: April 2007 aerial photograph.

LEGEND

- Groundwater Monitoring Well Location
- Surface Water Sampling Location
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary
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Note: Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

Beaumont Site 2

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Figure 2-3
Third Quarter 2008 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 two (2) locations during Second Quarter 2008, WS-1-Top and WS-1-Bottom, and from two (2) locations during Third Quarter 2008, WS-1-Top and WS-1-Bottom. Samples were tested for perchlorate. No other surface water samples were collected during this reporting period. Figure 2-4 presents the surface water locations sampled.

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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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
TT-MW2-2
TT-MW2-16
Water Tanks and Pump House
Concrete Mount
Centrifuge
Large Bunker
Historical Operational Area K Test Bays & Misc. Facilities
SW-1 (dry)
Prism
Parking Area
TT-MW2-17S/D
4 Test Bays
TT-MW2-3
TT-MW2-14
SW-2 (dry)
Small Bunker
Conditioning Chambers
TT-MW2-13
TT-MW2-18
TT-MW2-1
Historical Operational Area M Garbage Disposal Area
T-Revetment Conditioning Chambers
Disposal Site
Instrument Building
TT-MW2-12
TT-MW2-11
TT-MW2-10
SW-4 (dry)
Reported Propellant Burn Site
SW-3 (dry)
TT-MW2-4S
TT-MW2-4D
Historical Operational Area L Propellant Burn Area
Liquid Waste Discharge Ponds
TT-MW2-21
TT-MW2-23
TT-MW2-24
TT-MW2-22
SW-5 (dry)
TT-MW2-9S
TT-MW2-9D
1962 RWQCB Permitted Discharge Area
TT-MW2-5
TT-MW2-6S
TT-MW2-6D
TT-PZ2-1
SW-6 (dry)
TT-MW2-8
TT-MW2-7D
TT-MW2-7
TT-MW2-19S
TT-MW2-19D
WS-1 Top
WS-1 Bottom
TT-MW2-20S
TT-MW2-20D
SW-7

LEGEND

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

N

0 750 1,500 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 Water Sampling Locations

TETRA TECH

3.0 GROUNDWATER MONITORING RESULTS

The results of the Second Quarter 2008 and Third Quarter 2008 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 Second Quarter 2008 and Third Quarter 2008 monitoring events, depth to groundwater at the Site ranges from about 60 feet bgs in the northern portion (elevation of 2,078 feet msl, TT-MW2-16) to about 17 feet bgs in the southern portion (elevation of 1,819 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 Second Quarter 2008 and Third Quarter 2008 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 First Quarter 2008 quarterly monitoring event, groundwater levels measured during the Second Quarter 2008 monitoring event increased in QAL/wSTF screened monitoring wells an average of 0.08 feet and decreased in STF screened monitoring wells an average of 0.13 feet.

In comparison to the Second Quarter 2008 quarterly monitoring event, groundwater levels measured during the Third Quarter 2008 monitoring event decreased in QAL/wSTF screened monitoring wells an average of 0.36 feet and decreased in STF screened monitoring wells an average of 0.33 feet.

3.2 GROUNDWATER FLOW

Groundwater contour maps for first groundwater and the STF HSU from Second Quarter 2008 groundwater levels are presented in Figures 3-3 and 3-4 and from Third Quarter 2008 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 - Second Quarter 2008 and Third Quarter 2008

		Second Quarter 2008			Third Quarter 2008		
Well ID	HSU	Date Measured	Groundwater Elevation (feet msl)	Groundwater Elevation Change from First Quarter 2008 (feet)	Date Measured	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Second Quarter 2008 (feet)
Tt-MW2-1	QAL / WSTF	05/15/08	1978.61	-0.21	08/11/08	1978.42	-0.19
Tt-MW2-2	STF	05/15/08	2068.19	-0.25	08/11/08	2067.97	-0.22
Tt-MW2-3	QAL / WSTF	05/15/08	2024.51	0.04	08/11/08	2024.41	-0.10
Tt-MW2-4S	STF	05/15/08	1936.67	0.01	08/11/08	1936.54	-0.13
Tt-MW2-4D	STF	05/15/08	1930.33	-0.26	08/11/08	1930.03	-0.30
Tt-MW2-5	QAL / WSTF	05/15/08	1872.74	-0.15	08/11/08	1872.32	-0.42
Tt-MW2-6S	QAL / WSTF	05/15/08	1873.17	-0.45	08/11/08	1872.64	-0.53
Tt-MW2-6D	STF	05/15/08	1872.26	-0.34	08/11/08	1871.70	-0.56
Tt-MW2-7	QAL / WSTF	05/15/08	1821.30	0.40	08/11/08	1820.40	-0.90
Tt-MW2-7D	STF	05/15/08	1822.15	0.33	08/11/08	1821.31	-0.84
Tt-MW2-8	QAL / WSTF	05/15/08	1820.65	0.78	08/11/08	1819.17	-1.48
Tt-MW2-9S	QAL / WSTF	05/15/08	1901.57	-0.15	08/11/08	1901.03	-0.54
Tt-MW2-9D	STF	05/15/08	1897.25	-0.19	08/11/08	1896.77	-0.48
Tt-MW2-10	QAL / WSTF	05/15/08	1944.06	0.06	08/11/08	1943.93	-0.13
Tt-MW2-11	QAL / WSTF	05/15/08	1955.81	-0.30	08/11/08	1955.34	-0.47
Tt-MW2-12	STF	05/15/08	1966.12	-0.14	08/11/08	1965.95	-0.17
Tt-MW2-13	QAL / WSTF	05/15/08	1983.25	0.21	08/11/08	1983.48	0.23
Tt-MW2-14	QAL / WSTF	05/15/08	2009.21	0.97	08/11/08	2009.12	-0.09
Tt-MW2-16	QAL / WSTF	05/15/08	2077.48	0.22	08/11/08	2077.09	-0.39
Tt-MW2-17S	QAL / WSTF	05/15/08	2024.64	0.17	08/11/08	2024.52	-0.12
Tt-MW2-17D	QAL / WSTF	05/15/08	2024.22	-0.21	08/11/08	2024.11	-0.11
Tt-MW2-18	STF	05/15/08	1978.78	-0.22	08/11/08	1978.59	-0.19
Tt-MW2-19S	QAL / WSTF	NA	NA	NA	08/11/08	1645.77	NA
Tt-MW2-19D	STF	NA	NA	NA	08/11/08	1638.34	NA
Tt-MW2-20S	QAL / WSTF	05/15/08	1555.88	NA	08/11/08	1555.79	-0.09
Tt-MW2-20D	STF	05/15/08	1556.30	NA	08/11/08	1556.26	-0.04
Tt-MW2-21	STF	05/15/08	1912.60	-0.06	08/11/08	1912.47	-0.13
Tt-MW2-22	STF	05/15/08	1911.03	0.03	08/11/08	1910.89	-0.14
Tt-MW2-23	STF	05/15/08	1912.76	-0.03	08/11/08	1912.58	-0.18
Tt-MW2-24	QAL / WSTF	05/15/08	1910.71	0.02	08/11/08	1910.58	-0.13
Tt-MW2-PZ1	QAL / WSTF	05/15/08	1829.62	0.27	08/11/08	1828.36	-1.26

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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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
Concrete Mount
Water Tanks and Pump House
Centrifuge
Large Bunker
Prism
Historical Operational Area K Test Bays & Misc. Facilities
Parking Area
4 Test Bays
Small Bunker
Conditioning Chambers
T-Revetment Conditioning Chambers
Historical Operational Area M Garbage Disposal Area
Instrument Building
Disposal Site
Reported Propellant Burn Site
Liquid Waste Discharge Ponds
Historical Operational Area L Propellant Burn Area
1962 RWQCB Permitted Discharge Area

TT-MW2-2 2068:19 (-0.25)
TT-MW2-16 2077.48 (0.22)
TT-MW2-17S 2024.64 (0.17)
TT-MW2-17D 2024.22 (-0.27)
TT-MW2-3 2024.51 (0.04)
TT-MW2-14 2009.21 (0.97)
TT-MW2-13 1983.25 (0.21)
TT-MW2-18 1978.78 (0.22)
TT-MW2-1 1978.61 (-0.27)
TT-MW2-12 1966.12 (-0.14)
TT-MW2-11 1955.81 (-0.30)
TT-MW2-10 1944.06 (0.06)
TT-MW2-4S 1936.67 (0.01)
TT-MW2-4D 1930.33 (-0.26)
TT-MW2-21 1912.60 (-0.06)
TT-MW2-24 1910.71 (0.02)
TT-MW2-23 1912.76 (-0.04)
TT-MW2-9S 1901.57 (-0.15)
TT-MW2-22 1911.03 (0.03)
TT-MW2-9D 1897.25 (-0.19)
TT-MW2-6S 1873.17 (-0.45)
TT-MW2-5 1872.74 (-0.12)
TT-MW2-6D 1872.26 (-0.34)
TT-PZ2-1 1829.62 (0.27)
TT-MW2-7D 1822.15 (0.33)
TT-MW2-8 1820.65 (0.78)
TT-MW2-7 1821.30 (0.40)
TT-MW2-20S 1555.88
TT-MW2-20D 1556.30

LEGEND

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

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

* (feet) compared to First Quarter 2008.

Groundwater elevations in feet MSL.

Beaumont Site 2

Figure 3-1
Changes in Groundwater Elevations Second Quarter (May) 2008

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
Concrete Mount
Water Tanks and Pump House
Centrifuge
Large Bunker
Prism
Historical Operational Area K Test Bays & Misc. Facilities
Parking Area
4 Test Bays
Small Bunker
Conditioning Chambers
T-Revetment Conditioning Chambers
Historical Operational Area M Garbage Disposal Area
Instrument Building
Disposal Site
Reported Propellant Burn Site
Liquid Waste Discharge Ponds
Historical Operational Area L Propellant Burn Area
1962 RWQCB Permitted Discharge Area

TT-MW2-2 2067.97 -0.22
TT-MW2-16 2077.09 0.37
TT-MW2-17S 2024.52 -0.12
TT-MW2-17D 2024.11 -0.14
TT-MW2-3 2024.41 -0.10
TT-MW2-14 2009.12 -0.09
TT-MW2-13 1983.48 0.23
TT-MW2-18 1978.59 -0.15
TT-MW2-1 1978.42 -0.12
TT-MW2-12 1965.95 -0.17
TT-MW2-11 1955.34 -0.47
TT-MW2-10 1943.93 -0.17
TT-MW2-4S 1936.54 -0.13
TT-MW2-4D 1930.03 -0.30
TT-MW2-21 1912.47 -0.13
TT-MW2-24 1910.58 -0.15
TT-MW2-23 1912.58 -0.18
TT-MW2-9S 1901.03 -0.54
TT-MW2-22 1910.89 -0.14
TT-MW2-9D 1896.77 -0.48
TT-MW2-5 1872.32 -0.42
TT-MW2-6S 1872.64 -0.53
TT-MW2-6D 1871.70 -0.56
TT-MW2-7D 1821.31 -0.84
TT-PZ2-1 1828.36 -1.26
TT-MW2-8 1819.17 -1.48
TT-MW2-7 1820.40 -0.90
TT-MW2-19S 1645.77
TT-MW2-19D 1638.34
TT-MW2-20S 1555.79 -0.09
TT-MW2-20D 1556.26 -0.04

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

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

* (feet) compared to First Quarter 2008.

Groundwater elevations in feet MSL.

Beaumont Site 2

Figure 3-2
Changes in Groundwater Elevations Third Quarter (August) 2008

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
TT-MW2-16 2077.48'
Concrete Mount
Water Tanks and Pump House
Centrifuge
2060'
Large Bunker
Prism
TT-MW2-17S 2024.64'
Historical Operational Area K Test Bays & Misc. Facilities
2040'
TT-MW2-17D 2024.22'
Parking Area
4 Test Bays
TT-MW2-3 2024.51'
TT-MW2-14 2009.21'
Small Bunker
2000'
Conditioning Chambers
TT-MW2-13 1983.25'
1980'
TT-MW2-1 1978.61'
Historical Operational Area M Garbage Disposal Area
T-Revetment Conditioning Chambers
Disposal Site
Instrument Building
1960'
TT-MW2-11 1955.81'
Reported Propellant Burn Site
TT-MW2-10 1944.06'
1940'
Historical Operational Area L Propellant Burn Area
Liquid Waste Discharge Ponds
1920'
TT-MW2-24 1910.71'
TT-MW2-9S 1901.57'
1900'
1962 RWQCB Permitted Discharge Area
TT-MW2-6S 1873.17'
TT-MW2-5 1872.74'
1860'
1840'
TT-PZ2-1 1829.62'
TT-MW2-8 1820.65'
TT-MW2-7 1821.30'
1800'
1780'
1760'
1740'
1720'
1700'
1680'
1660'
1640'
1620'
1600'
1580'
1560'
TT-MW2-20S 1555.88'

LEGEND

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

N

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

20-foot groundwater contour interval.

Groundwater elevations in feet MSL.

Beaumont Site 2

Figure 3-3

First Groundwater Contours Second Quarter (May) 2008

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
TT-MW2-2 2068.19'
Water Tanks and Pump House
Concrete Mount
2060'
Centrifuge
Large Bunker
Prism
Historical Operational Area K Test Bays & Misc. Facilities
2040'
Parking Area
2020'
4 Test Bays
2000'
Small Bunker
Conditioning Chambers
TT-MW2-18 1978.78'
Historical Operational Area M Garbage Disposal Area
1980'
T-Revetment Conditioning Chambers
Disposal Site
TT-MW2-12 1966.12'
Instrument Building
TT-MW2-4S 1936.67'
Reported Propellant Burn Site
1940'
TT-MW2-4D 1930.33'
TT-MW2-21 1912.60'
Historical Operational Area L Propellant Burn Area
Liquid Waste Discharge Ponds
1920'
TT-MW2-23 1912.76'
1900'
TT-MW2-9D 1897.25'
TT-MW2-22 1911.03'
1962 RWQCB Permitted Discharge Area
1880'
TT-MW2-6D 1872.26'
1860'
1840'
TT-MW2-7D 1822.15'
1820'
1800'
1780'
1760'
1740'
1720'
1700'
1680'
1660'
1640'
1620'
1600'
1580'
1560'
TT-MW2-20D 1556.30'

LEGEND

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

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

20-foot groundwater contour interval.

Groundwater elevations in feet MSL.

Beaumont Site 2

Figure 3-4
Groundwater Contours for San Timoteo Formation Second Quarter (May 2008)

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
TT-MW2-16 2077.09'
Water Tanks and Pump House
Concrete Mount
Centrifuge
2060'
Large Bunker
Prism
TT-MW2-17S 2024.52'
Historical Operational Area K Test Bays & Misc. Facilities
2040'
TT-MW2-17D 2024.11'
Parking Area
4 Test Bays
2020'
TT-MW2-3 2024.41'
TT-MW2-14 2009.12'
Small Bunker
2000'
Conditioning Chambers
TT-MW2-13 1983.48'
1980'
TT-MW2-1 1978.42'
Historical Operational Area M Garbage Disposal Area
T-Revetment Conditioning Chambers
Disposal Site
Instrument Building
1960'
TT-MW2-11 1955.34'
Reported Propellant Burn Site
TT-MW2-10 1943.93'
1940'
Historical Operational Area L Propellant Burn Area
Liquid Waste Discharge Ponds
1920'
TT-MW2-9S 1901.03'
TT-MW2-24 1910.58'
1900'
1962 RWQCB Permitted Discharge Area
1880'
TT-MW2-5 1872.32'
TT-MW2-6S 1872.64'
1860'
1840'
TT-PZ2-1 1828.36'
TT-MW2-8 1819.17'
TT-MW2-7 1820.40'
1820'
1800'
1780'
1760'
1740'
1720'
1700'
1680'
1660'
TT-MW2-19S 1645.77'
1640'
1620'
1600'
1580'
1560'
TT-MW2-20S 1555.79'

LEGEND

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

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

20-foot groundwater contour interval.

Groundwater elevations in feet MSL.

Beaumont Site 2

Figure 3-5

First Groundwater Contours Third Quarter (August) 2008

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
TT-MW2-2 2067.97'
Water Tanks and Pump House
Concrete Mount
2060'
Centrifuge
Large Bunker
2040'
Historical Operational Area K Test Bays & Misc. Facilities
Prism
Parking Area
2020'
4 Test Bays
Small Bunker
2000'
Conditioning Chambers
TT-MW2-18 1978.59'
Historical Operational Area M Garbage Disposal Area
1980'
T-Revetment Conditioning Chambers
TT-MW2-12 1965.95'
Disposal Site
Instrument Building
TT-MW2-4S 1936.54'
Reported Propellant Burn Site
1940'
TT-MW2-4D 1930.03'
TT-MW2-21 1912.47'
Liquid Waste Discharge Ponds
1920'
Historical Operational Area L Propellant Burn Area
TT-MW2-23 1912.58'
1900'
TT-MW2-9D 1896.77'
TT-MW2-22 1910.89'
1962 RWQCB Permitted Discharge Area
1880'
TT-MW2-6D 1871.7'
1860'
1840'
TT-MW2-7D 1821.31'
1820'
1800'
1780'
1760'
1740'
1720'
1700'
1680'
1660'
1640'
TT-MW2-19D 1638.34'
1620'
1600'
1580'
1560'
TT-MW2-20D 1556.26'

LEGEND

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

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

20-foot groundwater contour interval.

Groundwater elevations in feet MSL.

Beaumont Site 2

Figure 3-6
Groundwater Contours for San Timoteo Formation Third Quarter (August 2008)

TETRA TECH

3.3 GROUNDWATER GRADIENTS

The horizontal groundwater gradients calculated between TT-MW2-16 and TT-MW2-6S from the Second Quarter 2008 and Third Quarter 2008 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 Second Quarter 2008 and Third Quarter 2008 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 0.260 to positive 0.0216. 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 STF TT-MW2-2 to TT-MW2-6D	Overall QAL/WSTF TT-MW2-16 to TT-MW2-6S
Second Quarter (May) 2008	0.029	0.030
Third Quarter (August) 2008	0.029	0.030

Vertical Groundwater Gradients (feet / foot)

-	Area J	Area K	Area L	Area L	Southern portion of Site 2	Southern portion of Site 2	Southern portion of Site 2	Former Wolfskill Property
deep screen	**TT-MW2-2** (STF)	**TT-MW2-17D** (QAL/WSTF)	**TT-MW2-4D** (STF)	**TT-MW2-18** (STF)	**TT-MW2-9D** (STF)	**TT-MW2-6D** (STF)	**TT-MW2-7D** (STF)	**TT-MW2-20D** (STF)
shallow screen	**TT-MW2-16** (QAL/WSTF)	**TT-MW2-17S** (QAL/WSTF)	**TT-MW2-4S** (STF)	**TT-MW2-1** (QAL / WSTF)	**TT-MW2-9S** (QAL/WSTF)	**TT-MW2-6S** (QAL/WSTF)	**TT-MW2-7** (QAL/WSTF)	**TT-MW2-20S** (QAL/WSTF)
Second Quarter (May) 2008	-0.1921	-0.00166	-0.2536	0.005	-0.1564	-0.0465	0.0200	0.0098
Third Quarter (August) 2008	-0.1894	-0.00163	-0.2604	0.005	-0.1558	-0.0486	0.0216	0.0110

Notes:

STF - San Timoteo Formation

QAL/WSTF - Quaternary Alluvium and weathered San Timoteo Formation

#.## - Positive (upward) vertical gradient

-#.## - Negative (downward) vertical gradient

3.4 ANALYTICAL DATA SUMMARY

Groundwater samples collected during the Second Quarter 2008 monitoring event were tested for VOCs, perchlorate, and select wells were sampled for total and dissolved CAM 17 metals, N-nitrosodimethylamine (NDMA), and Royal Demolition Explosives (RDX). VOCs and perchlorate are contaminants of potential concern at the Site. Groundwater samples collected during the Third Quarter 2008 monitoring event were tested for VOCs and perchlorate and select wells were sampled for general mineral parameters.

Summaries of validated laboratory analytical results for analytes detected above their respective MDLs during the monitoring events are presented in Tables 3-3, 3-4, and 3-5. 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, 3-4, and 3-5. 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 eleven (11) analytical data packages (08E210, 08E211, 08E233, 08E262, 08E287, 08E296, 08E329, 08E350, 08H281, 08H296, and 08I015) were reviewed using the latest versions of the National Functional Guidelines for Organic and Inorganic Data Review documents from the EPA (EPA, 1999 and 2004).

Holding times, field blanks, laboratory control samples, method blanks, duplicate environmental samples, spiked samples, and surrogate 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: Method E160.1 for Total Dissolved Solids, Method E300.0 for Anions, Method E310.2 for Alkalinity, Method E314.0 for Perchlorate, Method SW7470A for Mercury, Method SW8330 for Explosives, Method SW6010B for Metals, 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.

Method SW6010B had matrix spike recovery, matrix spike duplicate RPD, and field duplicate RPD errors that "J" qualified 0.7 percent of the total SW6010B data as estimated. All data qualified as estimated are usable for the intended purpose. None of the data collected during this reporting period was determined to be unusable.

Table 3-3 Summary of Detected Validated Organic Analytes - Second Quarter 2008 Quarter 2008

Sample Location	Sample Date	NDMA -ng/L	RDX -ug/L	Carbon Disulfide -ug/L	Chloroform - ug/L	1,2-Dichloro ethane -ug/L	1,1-Dichloro ethene -ug/L	Methylene Chloride -ug/L	Trichloroethene - ug/L
TT-MW2-1	5/27/2008	-	<0.2	<1	<1	<1	<1	<1	<1
TT-MW2-2	5/20/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-4S	5/21/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-5	5/23/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-6S	5/22/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-6D	5/22/2008	-	-	2.8 Jq	<1	<1	<1	<1	<1
TT-MW2-7	5/23/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-7D	5/22/2008	-	-	8.3	<1	<1	<1	<1	<1
TT-MW2-8	5/23/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-9S	5/23/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-9D	5/21/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-10	5/21/2008	-	<0.2	<1	<1	<1	<1	<1	<1
TT-MW2-11	5/28/2008	2.02	-	<1	<1	<1	<1	<1	**8.6**
TT-MW2-12	5/22/2008	2.14	-	<1	<1	<1	<1	<1	<1
TT-MW2-13	5/27/2008	-	**0.57 Jq**	<1	<1	<1	<1	<1	<1
TT-MW2-14	5/28/2008	<2.00	<0.2	<1	<1	<1	<1	3.4 Jq	<1
TT-MW2-16	5/20/2008	-	<0.2	<1	<1	<1	<1	<1	<1
TT-MW2-17S	5/27/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-17D	5/28/2008	-	-	<1	<1	<1	<1	<1	1.1 Jq
TT-MW2-18	5/27/2008	-	<0.2	<1	<1	<1	<1	<1	<1
TT-MW2-21	5/21/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-22	5/28/2008	-	-	1.1 Jq	1.2 Jq	**2.1 Jq**	**6.8**	**220**	**84**
TT-MW2-23	5/21/2008	-	-	<1	<1	<1	<1	<1	<1
TT-MW2-24	5/29/2008	-	-	<1	3.5 Jq	<1	1.9 Jq	<1	**110**
Method Detection Limit		2.0	0.20	1.0	1.00	1.00	1.00	1.00	1.00
MCL (unless noted) / DWNL		10 (1)	0.3 (1)	-	-	0.50	6.0	5.0	5.0

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.

NDMA - N-Nitrosodimethylamine
RDX - Royal Demolition Explosives
µg/L - Micrograms per liter
ng/L - Nanograms per liter
MCL - California Department of Health Maximum Contaminant Level.
DWNL - California Department of Health Services drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
Bold - Maximum Contaminant Level exceeded.
< # - Method detection limit concentration is shown.
J - The analyte was positively identified, but the concentration is an estimated value.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-4 Summary of Detected Validated Organic Analytes - Third Quarter 2008 Quarter 2008

Sample Location	Sample Date	Benzene - ug/L	Carbon Disulfide -ug/L	Chloroform - ug/L	1,1-Dichloro ethane - ug/L	1,2-Dichloro ethane - ug/L	1,1-Dichloro ethene - ug/L	c-1,2-Dichloro ethene - ug/L	Methylene Chloride - ug/L	Toluene -ug/L	1,1,2-Trichloro ethane -ug/L	Trichloro ethene -ug/L
TT-MW2-7D	8/26/2008	<0.2	3.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2
TT-MW2-21	8/26/2008	<0.2	0.32 Jq	<0.2	<0.2	<0.2	<0.2	<0.2	1.5	<0.2	<0.2	0.3 Jq
TT-MW2-22	8/26/2008	0.73 Jq	0.52 Jq	4.1	3.1	**5.3**	**27**	0.37 Jq	**25**	0.33 Jq	<0.2	**280**
TT-MW2-23	8/26/2008	<0.2	0.47 Jq	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2
TT-MW2-24	8/26/2008	0.2 Jq	<0.2	3.1	0.9 Jq	**0.68 Jq**	2.2	<0.2	0.81 Jq	<0.2	0.52 Jq	**90**
Method Detection Limit		0.20	5.0	0.20	0.20	0.20	0.20	0.20	0.50	0.20	0.20	0.20
MCL (unless noted) / DWNL		1.0	-	-	5.0	0.50	6.0	6.0	5.0	150	5.0	5.0

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

ng/L - Nanograms per liter

MCL - California Department of Health Maximum Contaminant Level.

DWNL - California Department of Health Services drinking water notification level.

(1) - DWNL

" - " MCL/DWNL not established.

Bold - Maximum Contaminant Level exceeded.

< # - Method detection limit concentration is shown.

J - The analyte was positively identified, but the concentration is an estimated value.

q - The analyte detection was below the Practical Quantitation Limit (PQL).

Table 3-5 Summary of Detected Validated Inorganic Analytes – Second Quarter 2008 and Third Quarter 2008

Sample Name	Sample Date	Filter Status	Perchlorate -ug/L	Arsenic -mg/L	Barium -mg/L	Copper -mg/L	Lead - mg/L	Mercury -mg/L	Molybdenum -mg/L	Nickel -mg/L	Selenium -mg/L	Vanadium -mg/L	Zinc - mg/L
TT-MW2-1	5/27/2008	Unfiltered	**11600**	<0.005	0.0759	<0.005	0.00373 Jq	0.000109 Jq	<0.01	<0.01	<0.005	0.00757 Jq	0.0068 Jq
TT-MW2-1	5/27/2008	Filtered	NA	<0.005	0.0787	<0.005	0.00321 Jq	<0.0001	<0.01	<0.01	<0.005	0.00718 Jq	<0.005
TT-MW2-2	5/20/2008	Unfiltered	<0.5	<0.005	0.00573 Jq	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	0.0107	0.0228
TT-MW2-2	5/20/2008	Filtered	-	<0.005	0.00574 Jq	<0.005	<0.003	0.000122 Jq	<0.01	<0.01	<0.005	0.0094 Jq	0.0209
TT-MW2-4S	5/21/2008	Unfiltered	<0.5	**0.0436**	0.0083 Jq	<0.005	<0.003	<0.0001	0.0129 Jq	<0.01	<0.005	0.0724	0.00504 Jq
TT-MW2-4S	5/21/2008	Filtered	NA	**0.0465**	0.00683 Jq	<0.005	<0.003	<0.0001	0.0133 Jq	<0.01	<0.005	0.0734	<0.005
TT-MW2-5	5/23/2008	Unfiltered	**944**	<0.005	0.0613	<0.005	<0.003	<0.0001	0.0133 Jq	<0.01	0.00707 Jq	<0.005	<0.005
TT-MW2-5	5/23/2008	Filtered	-	<0.005	0.0614	<0.005	<0.003	<0.0001	0.0135 Jq	<0.01	0.00643 Jq	<0.005	0.0061 Jq
TT-MW2-6S	5/22/2008	Unfiltered	**266**	<0.005	0.0341	<0.005	<0.003	<0.0001	0.0152 Jq	<0.01	0.00512 Jq	<0.005	0.0104
TT-MW2-6S	5/22/2008	Filtered	NA	<0.005	0.0339	<0.005	<0.003	<0.0001	0.0155 Jq	<0.01	0.00519 Jq	<0.005	0.0109
TT-MW2-6D	5/22/2008	Unfiltered	<0.5	0.00944 Jq	0.00513 Jq	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	<0.005	0.00601 Jq
TT-MW2-6D	5/22/2008	Filtered	NA	0.00757 Jq	0.00491 Jq	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	<0.005	<0.005
TT-MW2-7	5/23/2008	Unfiltered	**517**	<0.005	0.0329	<0.005	<0.003	<0.0001	0.0171 Jq	<0.01	0.00776 Jq	<0.005	<0.005
TT-MW2-7	5/23/2008	Filtered	-	<0.005	0.0331	<0.005	<0.003	<0.0001	0.0172 Jq	<0.01	0.0062 Jq	<0.005	0.0128
TT-MW2-7D	5/22/2008	Unfiltered	<0.5	**0.0172**	0.00537 Jq	<0.005	0.00313 Jq	<0.0001	0.0177 Jq	<0.01	<0.005	0.0132	0.0201
TT-MW2-7D	5/22/2008	Filtered	NA	**0.0154**	0.00291 Jq	<0.005	<0.003	<0.0001	0.0177 Jq	<0.01	<0.005	0.00502 Jq	0.0161
TT-MW2-7D	8/26/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-8	5/23/2008	Unfiltered	**519**	<0.005	0.043	<0.005	<0.003	<0.0001	0.0163 Jq	<0.01	0.0078 Jq	0.00882 Jq	0.0057 Jq
TT-MW2-8	5/23/2008	Filtered	NA	<0.005	0.0419	<0.005	<0.003	<0.0001	0.0163 Jq	<0.01	0.00862 Jq	0.00861 Jq	0.00599 Jq
TT-MW2-9S	5/23/2008	Unfiltered	**426**	<0.005	0.0644	<0.005	<0.003	<0.0001	0.0185 Jq	<0.01	<0.005	<0.005	0.00575 Jq
TT-MW2-9S	5/23/2008	Filtered	NA	<0.005	0.0648	<0.005	<0.003	<0.0001	0.0182 Jq	<0.01	<0.005	<0.005	0.0074 Jq
TT-MW2-9D	5/21/2008	Unfiltered	<0.5	0.00708 Jq	0.00941 Jq	<0.005	<0.003	<0.0001	0.0295 Jq	<0.01	<0.005	<0.005	<0.005
TT-MW2-9D	5/21/2008	Filtered	NA	0.00757 Jq	0.00857 Jq	<0.005	<0.003	<0.0001	0.0292 Jq	<0.01	<0.005	<0.005	<0.005
TT-MW2-10	5/21/2008	Unfiltered	<0.5	<0.005	0.106	<0.005	<0.003	<0.0001	<0.01	0.0387	<0.005	0.0219	<0.005
TT-MW2-10	5/21/2008	Filtered	NA	<0.005	0.1	<0.005	<0.003	<0.0001	<0.01	0.0189 Jq	<0.005	0.0207	0.00713 Jq
TT-MW2-11	5/28/2008	Unfiltered	**286**	<0.005	0.031	<0.005	<0.003	0.000221 Jq	<0.01	<0.01	0.00687 Jq	0.00929 Jq	0.0107
TT-MW2-11	5/28/2008	Filtered	NA	0.00684 Jq	0.0127	<0.005	<0.003	0.000115 Jq	<0.01	<0.01	0.01	0.00701 Jq	<0.005
TT-MW2-12	5/22/2008	Unfiltered	<0.5	0.00728 Jq	0.024	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	0.0113	0.00547 Jq
TT-MW2-12	5/22/2008	Filtered	NA	0.00861 Jq	0.022	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	0.0108	0.00617 Jq
TT-MW2-13	5/27/2008	Unfiltered	**2890**	<0.005	0.156	<0.005	0.00384 Jq	0.000238 Jq	<0.01	<0.01	0.00557 Jq	0.00716 Jq	0.0117
TT-MW2-13	5/27/2008	Filtered	NA	<0.005	0.155	<0.005	0.00355 Jq	0.000133 Jq	<0.01	<0.01	0.00528 Jq	0.00704 Jq	<0.005
TT-MW2-14	5/28/2008	Unfiltered	**46500**	<0.005	0.1	<0.005	0.00335 Jq	<0.0001	<0.01	<0.01	0.00869 Jq	0.0114	0.0136
TT-MW2-14	5/28/2008	Filtered	NA	<0.005	0.105	<0.005	0.00305 Jq	<0.0001	<0.01	<0.01	0.00792 Jq	0.0111	0.00668 Jq
TT-MW2-16	5/20/2008	Unfiltered	4.61	<0.005	0.398	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	0.0051 Jq	0.0147 Jf
TT-MW2-16	5/20/2008	Filtered	NA	<0.005	0.392	<0.005	0.0037 Jq	<0.0001	<0.01	<0.01	<0.005	0.00508 Jq	0.0205
TT-MW2-17S	5/27/2008	Unfiltered	**1900**	<0.005	0.0269	<0.005	<0.003	0.000229 Jq	0.017 Jq	<0.01	<0.005	<0.005	0.0141
TT-MW2-17S	5/27/2008	Filtered	NA	<0.005	0.0268	<0.005	<0.003	<0.0001	0.0166 Jq	<0.01	<0.005	<0.005	0.00671 Jq
TT-MW2-17D	5/28/2008	Unfiltered	**45100**	<0.005	0.0282	<0.005	<0.003	<0.0001	<0.01	<0.01	<0.005	<0.005	0.00586 Jq
TT-MW2-17D	5/28/2008	Filtered	NA	0.00609 Jq	0.0286	<0.005	<0.003	0.000177 Jq	<0.01	<0.01	<0.005	<0.005	0.00562 Jq
TT-MW2-18	5/27/2008	Unfiltered	**13000**	0.00813 Jq	0.0086 Jq	0.0113	<0.003	0.000164 Jq	0.0117 Jq	<0.01	<0.005	0.0287	0.0137
TT-MW2-18	5/27/2008	Filtered	NA	0.00974 Jq	0.00804 Jq	<0.005	<0.003	<0.0001	0.0117 Jq	<0.01	<0.005	0.0302	0.00866 Jq
TT-MW2-19S	9/2/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19D	8/27/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20S	5/20/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20S	8/27/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20D	5/20/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20D	8/27/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-21	5/21/2008	Unfiltered	<0.5	**0.0142**	0.00226 Jq	<0.005	<0.003	<0.0001	0.0223 Jq	<0.01	<0.005	<0.005	0.00919 Jq
TT-MW2-21	5/21/2008	Filtered	NA	**0.0123**	0.00201 Jq	<0.005	<0.003	<0.0001	0.0222 Jq	<0.01	<0.005	<0.005	0.00518 Jq
TT-MW2-21	8/26/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-22	5/28/2008	Unfiltered	<0.5	0.0094 Jq	0.00761 Jq	<0.005	<0.003	<0.0001	0.0291 Jq	<0.01	<0.005	<0.005	0.0105
TT-MW2-22	5/28/2008	Filtered	NA	**0.0106**	0.00718 Jq	<0.005	<0.003	0.000159 Jq	0.0283 Jq	<0.01	<0.005	<0.005	<0.005
TT-MW2-22	8/26/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-23	5/21/2008	Unfiltered	<0.5	0.00813 Jq	0.0336	<0.005	<0.003	<0.0001	0.0109 Jq	<0.01	<0.005	0.00875 Jq	0.01
TT-MW2-23	5/21/2008	Filtered	NA	0.00901 Jq	0.00883 Jq	<0.005	<0.003	<0.0001	0.013 Jq	<0.01	<0.005	<0.005	0.00667 Jq
TT-MW2-23	8/26/2008	Unfiltered	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-24	5/29/2008	Unfiltered	**142000**	<0.005	0.0474	0.00762 Jq	<0.003	<0.0001	0.0109 Jq	<0.01	<0.005	<0.005	0.00732 Jq
TT-MW2-24	5/29/2008	Filtered	NA	<0.005	0.0489	0.00734 Jq	<0.003	<0.0001	0.0109 Jq	<0.01	<0.005	<0.005	0.00879 Jq
TT-MW2-24	8/26/2008	Unfiltered	**158000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit			0.5	0.005	0.002	0.005	0.003	0.0001	0.01	0.01	0.005	0.005	0.005
MCL (unless noted) / DWNL			6	0.01	1	1.0	0.015	0.002	-	0.1	0.05	-	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

mg/L - Milligrams per liter

MCL - California Department of Health Maximum Contaminant Level.

DWNL - California Department of Health Services drinking water notification level.

(1) - DWNL

" - " MCL/DWNL not established.

NA - Not analyzed.

Bold - Maximum Contaminant Level exceeded.

< # - Method detection limit concentration is shown.

J - The analyte was positively identified, but the concentration is an estimated value.

q - The analyte detection was below the Practical Quantitation Limit (PQL).

3.5 CHEMICALS OF POTENTIAL CONCERN

An evaluation of COPCs of the Second Quarter 2008 monitoring event was performed. The analytes detected were screened against the MCLs or DWNLs (if an MCL is not established). The analytes were organized and evaluated in two (2) groups, organic and inorganic analytes, and divided into primary and secondary COPC. Laboratory analytical results from the Second Quarter 2008 and Third Quarter 2008 monitoring events are presented in the following two (2) subsections. Tables 3-6 and 3-7 present a summary of validated organic and inorganic analytes detected during the monitoring events. Data which is determined to be unusable during the data quality review is not included in the COPC evaluation.

Table 3-6 Summary Statistics of Validated Organic and Inorganic Analytes Detected Second 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:									
NDMA	3	2	0	10	ng/L	2.02	ng/L	2.14	ng/L
RDX	6	1	1	0.3	µg/L	0.57	µg/L	0.57	µg/L
Carbon Disulfide	24	3	0	160	µg/L (3)	1.1	µg/L	8.3	µg/L
Chloroform	24	2	0	-	µg/L	1.2	µg/L	3.5	µg/L
1, 2-Dichloroethane	24	1	1	0.5	µg/L	2.1	µg/L	2.1	µg/L
1, 1-Dichloroethene	24	2	1	6	µg/L	1.9	µg/L	6.8	µg/L
Methylene Chloride	24	2	1	5	µg/L	3.4	µg/L	220	µg/L
Trichloroethene	24	4	3	5	µg/L	1.1	µg/L	110	µg/L
Inorganic Analytes (2)**:**									
Perchlorate	27	14	13	6	µg/L	4.61	µg/L	142,000	µg/L
Arsenic	24	9	3	0.01	mg/L	0.00708	mg/L	0.0436	mg/L
Barium	24	24	0	1	mg/L	0.0083	mg/L	0.156	mg/L
Copper	24	2	0	1.0	mg/L	0.00762	mg/L	0.0113	mg/L
Lead	24	4	0	0.015	mg/L	0.00313	mg/L	0.00384	mg/L
Mercury	24	5	0	0.002	mg/L	0.000109	mg/L	0.000238	mg/L
Molybdenum	24	14	0	-	mg/L	0.0109	mg/L	0.0295	mg/L
Nickel	24	1	0	0.1	mg/L	0.0387	mg/L	0.0387	mg/L
Selenium	24	7	0	0.05	mg/L	0.00512	mg/L	0.00869	mg/L
Vanadium	24	13	0	0.05	mg/L (3)	0.0051	mg/L	0.0724	mg/L
Zinc	24	20	0	-	mg/L	0.00504	mg/L	0.0228	mg/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) - Unfiltered results are utilized for CAM 17 metals.
(3) - California Department of Health Services state drinking water notification level.
MCL - California Department of Health Maximum Contaminant Level.
DWNL - California Department of Health Services state drinking water notification level.
" - " MCL/DWNL not established.
µg/L - Micrograms per liter.
mg/L - Milligrams per liter.
ng/L - Nanograms per liter.

Table 3-7 Summary Statistics of Validated Organic and Inorganic Analytes Detected Third 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	2	0	1	µg/L	0.2	µg/L	0.73	µg/L
Carbon Disulfide	5	4	0	160	µg/L (3)	0.32	µg/L	3.4	µg/L
Chloroform	5	2	0	-	µg/L	3.1	µg/L	4.1	µg/L
1, 1-Dichloroethane	5	2	0	5	µg/L	0.9	µg/L	3.1	µg/L
1, 2-Dichloroethane	5	2	2	0.5	µg/L	0.68	µg/L	5.3	µg/L
1, 1-Dichloroethene	5	2	1	6	µg/L	2.2	µg/L	27	µg/L
cis-1, 2-Dichloroethene	5	1	0	6	µg/L	0.37	µg/L	0.37	µg/L
Methylene Chloride	5	3	1	5	µg/L	0.81	µg/L	25	µg/L
Toluene	5	1	0	150	µg/L	0.33	µg/L	0.33	µg/L
1, 1, 2-Trichloroethane	5	1	0	5	µg/L	0.52	µg/L	0.52	µg/L
Trichloroethene	5	3	2	5	µg/L	0.3	µg/L	280	µg/L
Inorganic Analytes (2)**:**									
Perchlorate	11	1	1	6	µg/L	158,000	µg/L	158,000	µg/L
Total Alkalinity	5	5	0	-	mg/L	72.5	mg/L	248	mg/L
Bicarbonate (as CaCO3)	5	5	0	-	mg/L	52.5	mg/L	248	mg/L
Carbonate (as CaCO3)	5	2	0	-	mg/L	15	mg/L	25	mg/L
Chloride	5	5	1	250	mg/L	37	mg/L	482	mg/L
Calcium	5	5	0	-	mg/L	2.52	mg/L	118	mg/L
Magnesium	5	5	0	-	mg/L	0.382	mg/L	14.2	mg/L
Nitrate	5	2	1	10	mg/L	0.0609	mg/L	65.1	mg/L
Potassium	5	5	0	-	mg/L	0.878	mg/L	2.96	mg/L
Total Dissolved Solids	5	5	1	500	mg/L	225	mg/L	1910	mg/L
Sodium	5	5	0	-	mg/L	77.7	mg/L	451	mg/L
Sulfate	5	5	0	250	mg/L	26.7	mg/L	108	mg/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) - Unfiltered results are utilized for CAM 17 metals.
(3) - California Department of Health Services state drinking water notification level.
MCL - California Department of Health Maximum Contaminant Level.
DWNL - California Department of Health Services state drinking water notification level.
" - " MCL/DWNL not established.
µg/L - Micrograms per liter.
mg/L - Milligrams per liter.

3.5.1 Organic Analytes

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

1,2-DCA was reported in groundwater samples collected from two monitoring wells in the former Liquid Waste Discharge Area sampled during the Second Quarter 2008 and Third Quarter 2008 monitoring events at concentrations ranging from 0.68 to 5.3 µg/L. The MCL for 1,2-DCA is 0.5 µg/L.

1,1-DCE was reported in groundwater samples collected from two monitoring wells in the former Liquid Waste Discharge Area sampled during the Second Quarter 2008 and Third Quarter 2008 monitoring events at concentrations ranging from 1.9 to 27 µg/L. The MCL for 1,1-DCE is 6 µg/L.

Methylene chloride was reported in groundwater samples collected from two monitoring wells in two locations sampled during the Second Quarter 2008 monitoring event, TT-MW2-14, 3.4 µg/L, located in Area K, and TT-MW2-22, 220 µg/L, located in the former Liquid Waste Discharge Area. During the Third Quarter 2008 monitoring event, methylene chloride was reported in groundwater samples collected from three monitoring wells, TT-MW2-21, TT-MW2-22 and TT-MW2-24, located in the former Liquid Waste Discharge Area at concentrations ranging from 0.81 to 25 µg/L. The MCL for methylene chloride is 5 µg/L.

TCE was reported in groundwater samples collected from four monitoring wells in three locations sampled during the Second Quarter 2008 monitoring event, TT-MW2-17D located in Area K, TT-MW2-11 located in Area M, and TT-MW2-22 and TT-MW2-24 located in the former Liquid Waste Discharge Area, at concentrations ranging from 1.1 to 110 µg/L. During the Third Quarter 2008 monitoring event, TCE was reported in groundwater samples collected from three monitoring wells, TT-MW2-21, TT-MW2-22 and TT-MW2-24, located in the former Liquid Waste Discharge Area at concentrations ranging from 0.3 to 280 µg/L. The TCE MCL is 5 µg/L. TCE has not been reported in any of the other groundwater samples collected. Figure 3-7 presents a TCE isoconcentration map for groundwater samples collected for the Second Quarter 2008 Time-series graphs of TCE are provided in Appendix I.

Other organic analytes detected at low levels and below their respective MCLs or DWNLs during the Second Quarter 2008 and Third Quarter 2008 groundwater monitoring events were NDMA, benzene, carbon disulfide, chloroform, 1,1-DCA, cis-1,2 DCE, toluene, 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.

X:\GIS\Lockheed 23522-0103\TCE.mxd

TT-MW2-2
ND

TT-MW2-16
ND

Historical Operational Area J
Final Assembly

Test Bay Canyon

TT-MW2-17S
ND

TT-MW2-17D
1.1

Historical Operational Area K
Test Bays & Misc. Facilities

TT-MW2-14
ND

TT-MW2-13
ND

Laborde Canyon

TT-MW2-18
ND

TT-MW2-1
ND

Historical Operational Area M
Garbage Disposal Area

TT-MW2-12
ND

Disposal Site Canyon

TT-MW2-10
ND

5

TT-MW2-11
8.6

TT-MW2-4S
ND

Historical Operational Area L
Propellant Burn Area

TT-MW2-21
ND

Liquid Waste
Disposal Area

TT-MW2-24
110

TT-MW2-23
ND

100

5

TT-MW2-22
84

TT-MW2-9S
ND

TT-MW2-9D
ND

1962 RWQCB Permitted
Discharge Area

TT-MW2-6S
ND

TT-MW2-5
ND

TT-MW2-6D
ND

TT-MW2-7
ND

TT-MW2-8
ND

TT-MW2-7D
ND

LEGEND

TT-MW2-11 Well ID
286 Trichloroethene Concentration

Trichloroethene Isoconcentration Contour
(dashed where inferred)

Historical Operational
Area Boundary

Beaumont Site 2
Property Boundary

RWQCB Permitted
Discharge Area

Liquid Waste
Disposal Area

N

0 300 600
Feet

Adapted from: April 2007 aerial photograph.

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

Beaumont Site 2

Revised

Figure 3-7
Trichloroethene (TCE) Isoconcentration Map (µg/L)

TETRA TECH

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 10 organic analytes 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

Two inorganic analytes (perchlorate and arsenic) were detected in groundwater above a published MCL. Table 3-5 presents a summary of validated inorganic analyte concentrations reported in groundwater samples collected during the Second Quarter 2008 and Third Quarter 2008 groundwater monitoring events.

Perchlorate was reported in groundwater samples collected from 15 of 26 locations sampled during the Second Quarter 2008 groundwater monitoring event and one of nine locations sampled during the Second Quarter 2008 monitoring event, at concentrations up to 142,000 and 158,000 µg/L, respectively. The California MCL for perchlorate is 6 µg/L. Figure 3-8 presents a perchlorate isoconcentration map for groundwater samples collected for the Second Quarter 2008. Time-series graphs of perchlorate are provided in Appendix I.

Total arsenic was detected in nine of 24 unfiltered samples collected from groundwater monitoring wells during the Second Quarter 2008 groundwater monitoring event. The concentrations ranged from 0.00708 to 0.0436 mg/L. Three of the wells had concentrations that exceeded the 0.01 mg/L MCL for arsenic.

Generally, concentrations of arsenic in wells screened in the San Timoteo formation are elevated. Groundwater conditions in many of these same wells, including those with arsenic concentrations above the MCL, are reduced. Therefore, the elevated arsenic concentrations in these wells may be naturally occurring.

X:\GIS\Lockheed 23522-0103\Perchlorate.mxd

TT-MW2-2
ND

TT-MW2-16
4.61

Historical Operational Area J
Final Assembly

Test Bay Canyon

TT-MW2-17S
1,900

TT-MW2-17D
45,100

10,000

5,000

1,000

Historical Operational Area K
Test Bays & Misc. Facilities

TT-MW2-14
46,500

TT-MW2-13
2,890

Laborde Canyon

TT-MW2-18
13,000

5,000

10,000

TT-MW2-1
11,600

Historical Operational Area M
Garbage Disposal Area

TT-MW2-12
ND

Disposal Site Canyon

TT-MW2-11
286

100

TT-MW2-10
ND

TT-MW2-4S
ND

Historical Operational Area L
Propellant Burn Area

Liquid Waste
Disposal Area

TT-MW2-21
ND

TT-MW2-24
142,000

100,000

1,000

TT-MW2-23
ND

10,000

5,000

TT-MW2-9S
426

TT-MW2-22
ND

TT-MW2-9D
ND

1962 RWQCB Permitted
Discharge Area

100

TT-MW2-5
944

TT-MW2-6S
266

TT-MW2-6D
ND

100

TT-MW2-7D
ND

TT-MW2-8
519

TT-MW2-7
517

LEGEND

TT-MW2-11 *286* — Well ID, Perchlorate Concentration

Perchlorate Isoconcentration Contour (dashed where inferred)

Historical Operational Area Boundary

Beaumont Site 2 Property Boundary

RWQCB Permitted Discharge Area

N

0 300 600 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
Perchlorate Isoconcentration Map (µg/L)

TETRA TECH

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 SURFACE WATER SAMPLING RESULTS

Surface water samples were collected for perchlorate at two locations from a spring on the former Wolfskill property during Second Quarter 2008. The first sample, WS-1-Top, was collected on 20 May, 2008 from a small depression dug at the top section of the spring; perchlorate was detected at a concentration of 12 µg/L from this sample. A second sample, WS-1-Bottom, was collected on 15 July, 2008 at the bottom section of the spring where water flows across the road. Perchlorate was not detected above the method detection limit (MDL) in this sample.

During Third Quarter 2008 samples were collected from both locations, WS-1-Top and WS-1-Bottom, and analyzed for perchlorate. Perchlorate was not detected above the MDL in either sample. The California MCL for perchlorate is 6 µg/L.

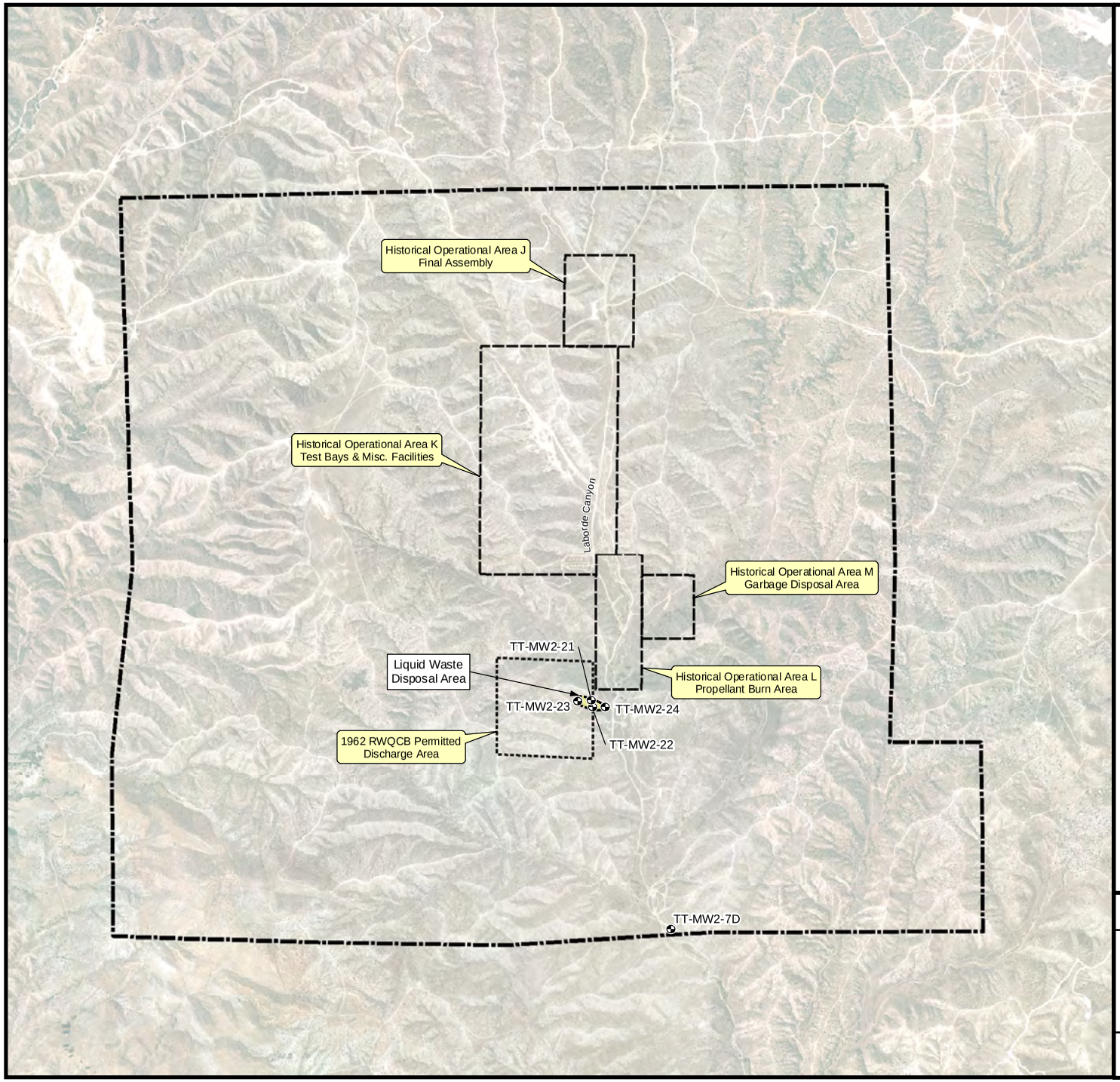
3.7 GENERAL MINERAL SAMPLING

All site monitoring wells are sampled for general mineral to facilitate the identification of the QAL/wSTF, and the STF HSUs after they have been in place for a minimum of six (6) months. The five new monitoring wells, TT-MW2-7D, TT-MW2-21, TT-MW2-22, TT-MW2-23, and TT-MW2-24 installed during October 2007 and November 2007 were sampled for general minerals during August 2008 (Third Quarter 2008) (Figure 3-9). The previously existing wells were sampled for general minerals during Third Quarter 2007. A summary of the test results for the new wells is included in Table 3-8.

The most abundant dissolved constituents measured in groundwater are the major ions, which can be both positively charged (cations) and negatively charged (anions) [Bartos, et. al., 2002]. Because of the requirements of electroneutrality, cations and anions are present at equal concentrations in water and comprise most of the dissolved solids in groundwater. The most abundant cations present in water are calcium (Ca), magnesium (Mg), sodium (Na), and potassium (K), the most abundant anions are bicarbonate (HCO3), chloride (Cl), and sulfate (SO4). By measuring the concentrations of these ions in groundwater samples, the ionic composition of the water is determined and the chemical quality of the water can be characterized and described.

The ionic composition of water is used to classify it into ionic types based on the dominant dissolved cation and anion, expressed in milliequivalents per liter (meq/L) [Bartos, et. al., 2002]. Table 3-9 presents a summary of the general minerals data reported in milliequivalents. A milliequivalent (meq) is a measurement of the molar concentration of the ion, normalized by the ionic charge of the ion.

X:\GIS\Lockheed 23522-0103\General Minerals Samp Loc.mxd



0 1,000 2,000
Feet

Adapted from: April 2007 aerial photograph.

LEGEND

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

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

Beaumont Site 2

Revised

Figure 3-9
General Minerals Sampling Locations

TETRA TECH

Table 3-8 Summary of Validated General Minerals Results - Third Quarter 2008

Sample Location	Sample Date	Potassium K (mg/L)	Sodium Na (mg/L)	Calcium Ca (mg/L)	Magnesium Mg (mg/L)	Chloride Cl (mg/L)	Sulfate SO_4 (mg/L)	Alkalinity, Total - mg/L	Carbonate CO_3 (mg/L) (1)	Bi carbonate HCO_3 (mg/L) (1)	Nitrate NO_3 (mg/L) (2)	Total Dissolved Solids (mg/L)	Perch lorate (mg/L)	ORP (mv)	DO (mg/L)	pH
TT-MW2-7D	8/26/2008	1.78 Jq	77.7	2.52	0.389 Jq	37	27.4	77.5	52.5	25	<0.05	225	<0.5	-199.4	0.26	9.05
TT-MW2-21	8/26/2008	2.96	152	7.93	2	163	44.4	72.5	72.5	<1	0.0609 Jq	430	<0.5	-127.3	0.53	8.23
TT-MW2-22	8/26/2008	2.9	155	13.8	2.51	158	31.8	113	113	<1	<0.05	455	<0.5	-158.5	0.27	7.67
TT-MW2-23	8/26/2008	0.878 Jq	115	5.93	0.382 Jq	105	26.7	67.5	52.5	15	<0.05	305	<0.5	-178.0	0.48	8.88
TT-MW2-24	8/26/2008	2.87	451	118	14.2	482	108	248	248	<1	65.1	1910	158000	-10.4	0.61	7.18
Method Detection Limit		0.1	0.1	0.1	0.1	0.1	0.25	1	1	1	0.05	5	0.5	NA	NA	NA
MCL/DWNL		-	-	-	0.05	250	250	-	-	-	10	500	6	NA	NA	NA

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.

(1) - As calcium carbonate (CaCO3).
(2) - As nitrogen (N).
MCL - Maximum Contaminant Level.
DWNL - California Department of Health Services state drinking water notification level.
"-" - MCL or DWNL not available.
J - The analyte was positively identified, but the analyte concentration is an estimated value.
q - The analyte detection was below the Practical Quantitation Limit (PQL).

Bold - Maximum Contaminant Level or DWNL exceeded.
mg/L - Milligrams per liter.
µg/L - Micrograms per liter
mv - Millivolts
< # - Less than method detection limit concentration shown.
ORP - Oxidation reduction potential.
DO - Dissolved oxygen.

Table 3-9 Summary of General Minerals Reported in Milliequivalents - Third Quarter 2008

Well	Potassium meq/l	Sodium meq/l	Calcium meq/l	Magnesium meq/l	Chloride meq/l	Sulfate meq/l	Carbonate meq/l	Bicarbonate meq/l	Nitrate meq/l	Total Dissolved Solids mg/l	Water type
TT-MW2-7D	0.05	3.38	0.13	0.03	1.04	0.57	1.75	0.41	<0.00	225	Na-CO_3-Cl
TT-MW2-21	0.08	6.61	0.40	0.16	4.60	0.93	2.42	<0.02	0.00	430	Na-Cl-CO_3
TT-MW2-22	0.07	6.74	0.69	0.21	4.46	0.66	3.77	<0.02	<0.00	455	Na-Cl-CO_3
TT-MW2-23	0.02	5.00	0.30	0.03	2.96	0.56	1.75	0.25	<0.00	305	Na-Cl-CO_3
TT-MW2-24	0.07	19.62	5.89	1.17	13.60	2.25	8.27	<0.02	1.05	1910	Na-Ca-Cl-CO_3

Notes:
mg/L - Milligrams per liter.
meq/L - Milliequivalents per liter (concentration in mg/L divided by the ion molecular weight and charge)

The dominant dissolved ion must be greater than 50 % of the total. For example, water classified as a sodium-bicarbonate type water contains more than 50 % of the total cation milliequivalents as sodium and more than 50 % of the total anion milliequivalents as bicarbonate. If no cation or anion is dominant (greater than 50 %), the water is classified as mixed and the two (2) most common cations or anions in decreasing order of abundance are used to describe the water type.

Site 2 has elevated levels of perchlorate in the groundwater and reduced conditions are exhibited in some of the wells. Under reducing conditions, perchlorate will reduce to oxygen and chloride, resulting in increased levels of chloride anions. There may be a correlation between elevated perchlorate and elevated chloride in some of the wells on the Site.

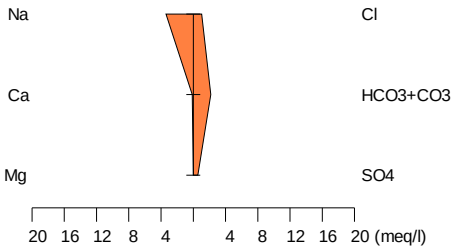
In general, calcium and magnesium cations change from dominant to subordinate cations in relation to total cations with increasing depth (age) and with increasing distance (age) from sources of recharge. The shallower QAL/wSTF wells at the Site generally show a mixed sodium and calcium cation signature with a bicarbonate dominant or a mixed bicarbonate and sulfate anion signature. The mixed anion signature appears to be more prevalent in the southern half of the Site. The deeper STF wells on the Site show little or no calcium or magnesium resulting in a sodium dominant cation signature with a bicarbonate dominant or a mixed bicarbonate and sulfate anion signature. The dominance of sodium seems to be the most significant characteristic distinguishing the QAL/wSTF wells from the STF wells.

Stiff diagrams are a visual method to compare the relative proportions of ions in water. Ion concentrations in mg/L are converted to meq/L. Cations are plotted on the left side of the diagram, with anions plotted on the right. The lengths of the diagram vertices are proportional to ionic content. Different ion combinations can be plotted in Stiff diagrams depending on aqueous geochemistry. Again, as a result of little or no calcium in the deeper STF wells, two (2) distinct patterns resulted from the Stiff diagrams (Figure 3-10).

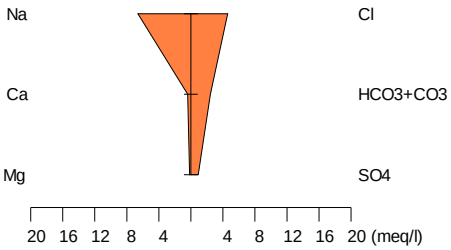
Based on the ionic composition evaluation discussed above the following monitoring wells on the Site have been designated STF monitoring wells: TT-MW2-7D, TT-MW2-21, TT-MW2-22, and TT-MW2-23 and monitoring well TT-MW2-24 has been designated QAL/wSTF.

Figure 3-10 Siff Diagrams

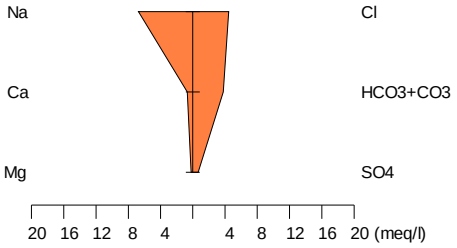
TT-MW2-7D, STF, Na-CO3-Cl



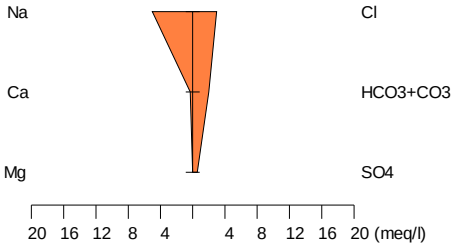
TT-MW2-21, STF, Na-Cl-CO3



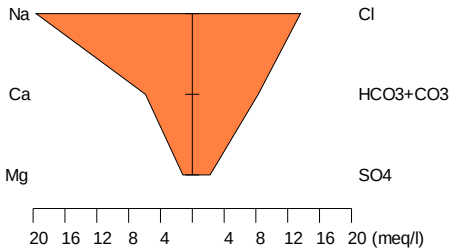
TT-MW2-22, STF, Na-Cl-CO3



TT-MW2-23, STF, Na-Cl-CO3



TT-MW2-24, QAL/wSTF, Na-Ca-Cl-CO3



3.8 TEMPORAL TRENDS IN GROUNDWATER CHEMICAL CONCENTRATIONS

Time trend analysis of the LMC Beaumont Site 2 groundwater quality data was conducted using the Monitoring and Remediation Optimization System (MAROS) developed by the Air Force Center for Environmental Excellence (AFCEE, 2002). MAROS is a statistical database application developed to assist with groundwater quality data trend analysis and long-term monitoring optimization at contaminated groundwater Sites. The software performs parametric and nonparametric trend analyses to evaluate temporal and spatial contaminant trends. The Mann-Kendall statistical test is used to determine whether concentrations at a sampling location are decreasing or increasing over time in a statistically significant manner, and linear regression is used to determine the magnitude of any statistically significant trends.

Time trend analysis was conducted for site key COCs, including perchlorate and TCE. The time period considered covers the entire period of record from September 2004 through September 2008. The monitoring locations considered includes twenty-eight (28) monitoring wells (TT-MW2-1, TT-MW2-2, TT-MW2-3, TT-MW2-4S, TT-MW2-4D, TT-MW2-5, TT-MW2-6S, TT-MW2-6D, TT-MW2-7, TT-MW2-7D, TT-MW2-8, TT-MW2-9S, TT-MW2-9D, TT-MW2-10, TT-MW2-11, TT-MW2-12, TT-MW2-13, TT-MW2-14, TT-MW2-16, TT-MW2-17S, TT-MW2-17D, TT-MW2-18, TT-MW-20S, TT-MW-20D, TT-MW-21, TT-MW-22, TT-MW-23, and TT-MW-24). Statistical trend analyses were conducted for the entire period of record to evaluate the long-term trends at the site, and to access the variability observed in the data since many locations fluctuate considerably from quarter to quarter. However, nineteen (19) of the wells only have data for the recent one and one-half (1.5) year period from Fall 2006 through September 2008. Only eight wells (TT-MW2-1, TT-MW2-2, TT-MW2-3, TT-MW2-4S, TT-MW2-4D, TT-MW2-5, TT-MW2-6S, and TT-MW2-6D) have data for the longer time period. Thus, for the majority of the wells, the trends really reflect the groundwater conditions during the last year and a half.

The results of the statistical trend analysis are summarized in Table 3-10 and given in detail in Appendix J. Concentration data from a particular location is classified statistically in one of the following categories based upon the results of the Mann-Kendall test and the coefficient of variation:

- Increasing (I) – Time trend test has a positive slope and is statistically significant at over a 95 percent confidence level;
- Probably Increasing (PI) – Time trend test has a positive slope and is statistically significant at a confidence level between 90 and 95 percent;

- Decreasing (D) – Time trend test has a negative slope and is statistically significant at over a 95 percent confidence level;
- Probably Decreasing (PD) – Time trend test has a negative slope and is statistically significant at a confidence level between 90 and 95 percent;
- Stable (S) – Time trend test is not statistically significant (confidence level below 90 percent) and the data show little variation (coefficient of variation less than 1);
- No Trend (NT) – Time trend test is not statistically significant (confidence level below 90 percent) and the data show larger variation (coefficient of variation greater than 1); and
- Not Applicable (N/A) – Insufficient data for statistical trend analysis.

For wells with statistically significant increasing or decreasing trends, the concentration slope is also given in units of µg/L per year and percent of mean value per year based upon the slope determined from the linear regression analysis.

In general, the time trend analyses in Table 3-10 show that the majority of the sampling locations and chemicals were statistically stable over time. Note that the seven most recently installed wells (TT-MW2-7D, TT-MW-20S, TT-MW-20D, TT-MW-21, TT-MW-22, TT-MW-23, and TT-MW-24) only had three or less samples and could not be analyzed for statistically significant trends, which require a minimum of four samples. For the remaining wells with sufficient data for statistical analysis, 43 percent (9 of 21) of the data sets were statistically stable for perchlorate, 10 percent (2 of 21) of the data sets showed no statistically significant trend over time for perchlorate, 19 percent (4 of 21) of the data sets have a decreasing or probably decreasing trend over time for perchlorate, and 29 percent (6 of 21) of the data sets have an increasing or probably increasing trend over time for perchlorate. For TCE, 85 percent (18 of 21) of the data sets were statistically stable, 10 percent (2 of 21) of the data sets showed no statistically significant trend over time, 0 percent (0 of 21) of the data sets have a decreasing or probably decreasing trend over time, and 5 percent (1 of 21) of the data sets have an increasing or probably increasing trend over time.

The perchlorate data and trend analyses show the declining trends occurred near the source area (TT-MW2-17) and in the middle of the site below TT-MW2-4S and TT-MW2-4D (the break in the plume) at TT-MW2-9, while increasing trends occurred at the southern limit of the site at TT-MW2-8 and in the middle of the site above TT-MW2-4S and TT-MW2-4D at TT-MW2-2 and TT-MW2-11. The decreasing trends seem to occur on the up gradient side of both the potential “upper” and ”lower” plumes, and the increasing trends seem to occur on the down gradient side of both the potential “upper” and “lower” plumes. Thus, these decreasing and increasing trends could be attributed to migration of the separate upper and lower plumes, and may add further evidence in support of the separation of the site into two

distinct plumes. However, this trend analysis covers a rather small time period for most of the wells, and these trends will become more meaningful if they persist as additional data is collected. Further, many of the wells have only recently been installed and some variability in the concentrations in the initial samples is possible. This variability could also cause complications with the statistical analysis.

Table 3-10 Summary of Mann-Kendall and Linear Regression Statistical Analysis

Sample Location	Perchlorate				TCE			
	Mean (1) (µg/L)	Trend	Magnitude of Trend (%/yr)	Magnitude of Trend (µg/L/yr)	Mean (1) (µg/L)	Trend	Magnitude of Trend (%/yr)	Magnitude of Trend (µg/L/yr)
TT-MW2-1	5,700.0	I	13.0	740.7	0.67	NT		
TT-MW2-2	1.0	S			0.5	S		
TT-MW2-3	29,000.0	S			4.4	S		
TT-MW2-4D	1.0	S			0.5	S		
TT-MW2-4S	1.1	S			0.5	S		
TT-MW2-5	950.0	I	2.0	19.4	0.5	S		
TT-MW2-6D	0.9	NT			0.5	S		
TT-MW2-6S	270.0	S			0.5	S		
TT-MW2-7	460.0	I	8.2	37.6	0.5	S		
TT-MW2-7D	1.0	N/A			0.5	N/A		
TT-MW2-8	380.0	PI	5.3	20.0	0.5	S		
TT-MW2-9D	9.2	D	-94.9	-8.7	0.5	S		
TT-MW2-9S	280.0	S			0.5	S		
TT-MW2-10	1.0	S			0.5	S		
TT-MW2-11	280.0	I	14.3	40.1	6.4	I	10.4	0.7
TT-MW2-12	2.5	NT			0.5	S		
TT-MW2-13	3,900.0	D	-19.0	-740.22	0.5	S		
TT-MW2-14	43,000.0	I	9.1	3,892.4	5.3	NT		
TT-MW2-16	3.9	S			0.5	S		
TT-MW2-17D	50,000.0	S			1.0	S		
TT-MW2-17S	3,300.0	D	-29.2	-963.6	0.5	S		
TT-MW2-18	16,000.0	PD	-4.8	-770.9	0.5	S		
TT-MW2-20D	1.0	N/A				N/A		
TT-MW2-20S	1.0	N/A				N/A		
TT-MW2-21	1.0	N/A			1.2	N/A		
TT-MW2-22	1.0	N/A			63.0	N/A		
TT-MW2-23	1.0	N/A			1.2	N/A		
TT-MW2-24	130,000.0	N/A			89.0	N/A		

Notes:

Trend Categories	**Perc (# wells)**	**% Total**	**TCE (# wells)**	**% Total**
"N/A"-Insufficient Data	7		7	
"NT" - No Trend	2	10	2	10
"S" - Stable	9	43	18	85
"I" - Increasing	5	24	1	5
"PI" -Probably Increasing	1	5	0	0
"D" - Decreasing	3	14	0	0
"PD" -Probably Decreasing	1	5	0	0
Total		100		100

Definitions:

%/yr - percent per year
µg/L/yr - microgram per liter per year
mg/L/yr - milligram per liter per year
(1) - If all samples are below the detection limit, one half the reporting limit is used

X:\GIS\Lockheed 23522-01103\Trend.mxd

Historical Operational Area J Final Assembly
Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Concrete Mount
Centrifuge
Large Bunker
Prism
Historical Operational Area K Test Bays & Misc. Facilities
4 Test Bays
Small Bunker
Conditioning Chambers
T-Revetment Conditioning Chambers
Instrument Building
Reported Propellant Burn Site
Disposal Site
Liquid Waste Discharge Ponds
Historical Operational Area M Garbage Disposal Area
Historical Operational Area L Propellant Burn Area
1962 RWQCB Permitted Discharge Area
TT-MW2-PZ1

TT-MW2-2 — Perchlorate: ◆ — TCE: ◆
TT-MW2-16 — Perchlorate: ◆ — TCE: ◆
TT-MW2-3 — Perchlorate: ◆ — TCE: ◆
TT-MW2-17S — Perchlorate: ▼ -29.2 — TCE: ◆
TT-MW2-13 — Perchlorate: ▼ -19.0 — TCE: ◆
TT-MW2-17D — Perchlorate: ◆ — TCE: ◆
TT-MW2-1 — Perchlorate: ▲ 13.0 — TCE: ▭
TT-MW2-14 — Perchlorate: ▲ 9.1 — TCE: ⊘
TT-MW2-18 — Perchlorate: ▼ -4.8 — TCE: ◆
TT-MW2-21 — Perchlorate: ⊘ — TCE: ⊘
TT-MW2-12 — Perchlorate: ▭ — TCE: ◆
TT-MW2-11 — Perchlorate: ▲ 14.3 — TCE: ▲ 10.4
TT-MW2-23 — Perchlorate: ⊘ — TCE: ⊘
TT-MW2-10 — Perchlorate: ◆ — TCE: ◆
TT-MW2-22 — Perchlorate: ⊘ — TCE: ⊘
TT-MW2-4S — Perchlorate: ◆ — TCE: ◆
TT-MW2-24 — Perchlorate: ⊘ — TCE: ⊘
TT-MW2-5 — Perchlorate: ▲ 2.0 — TCE: ◆
TT-MW2-9S — Perchlorate: ◆ — TCE: ◆
TT-MW2-4D — Perchlorate: ◆ — TCE: ◆
TT-MW2-9D — Perchlorate: ▼ -94.9 — TCE: ◆
TT-MW2-6S — Perchlorate: ▭ — TCE: ◆
TT-MW2-6D — Perchlorate: ◆ — TCE: ◆
TT-MW2-7D — Perchlorate: ⊘ — TCE: ⊘
TT-MW2-8 — Perchlorate: ▲ 5.3 — TCE: ◆
TT-MW2-7 — Perchlorate: ▲ 8.2 — TCE: ◆
TT-MW2-20S — Perchlorate: ⊘ — TCE: ⊘
TT-MW2-20D — Perchlorate: ⊘ — TCE: ⊘

LEGEND

Analyte Trend (percent/year)

- Increasing
- Probably Increasing
- No Trend
- Stable
- Proabably Decreasing
- Decreasing
- Insufficient Data

- Monitoring Well Location
- Piezometer Well Location
- RWQCB Permitted Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 750 1,500 Feet

Adapted from: April 2007 aerial photograph.

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

Beaumont Site 2

Figure 3-11

Perchlorate and TCE Statistical Summary Results Second Quarter (May) 2008

TETRA TECH

3.9 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 Second Quarter 2008 and Third Quarter 2008 monitoring events.

4.0 SUMMARY AND CONCLUSIONS

This section summarize the results of the Second Quarter 2008 and Third Quarter 2008 groundwater monitoring events. During the Second Quarter 2008 monitoring event 28 monitoring well locations and one piezometer were measured for groundwater levels and 26 monitoring wells and two (2) surface water locations were sampled for groundwater quality. During the Third Quarter 2008 monitoring event 30 monitoring well locations and one piezometer were measured for groundwater levels and 9 monitoring wells and two (2) surface water locations were sampled for groundwater quality.

4.1 GROUNDWATER ELEVATION AND FLOW

During the Second Quarter 2008 and Third Quarter 2008 monitoring events, depth to water at the Site ranged from approximately 60 feet bgs (elevation of 2,078 feet msl) upgradient in the northern most well to 17 feet bgs (elevation of 1,819 feet msl) down gradient in the southernmost 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 follows 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 is 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 Second Quarter 2008 and Third Quarter 2008 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 Second Quarter 2008 and Third Quarter 2008 groundwater monitoring events for the STF HSU was 0.029 ft/ft.

Vertical groundwater gradients at the Site are generally downward. The vertical gradients range from negative 0.260 to positive 0.005. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-2 and in Appendix E. Generally the vertical gradients are downward on the Site and upward form the Site boundary south.

4.2 WATER QUALITY MONITORING

Groundwater samples collected during the Second Quarter 2008 and Third Quarter 2008 monitoring events were tested for VOCs and perchlorate. Select wells were tested for total and dissolved CAM 17 metals, general minerals parameters, NDMA, 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. Historic maximum and minimum COPC concentrations for the time period from September 2004 to present are presented in Table 4-1.

Perchlorate was reported in groundwater samples collected from 15 of 26 and one (1) of nine (9) locations sampled during the Second Quarter 2008 and Third Quarter 2008 monitoring events, respectively. During the Second Quarter 2008 monitoring event, perchlorate was reported in groundwater samples collected at concentrations ranging from 4.61 to 142,000 µg/L, and the perchlorate MCL of 6 µg/L was exceeded in 13 of the 26 groundwater samples collected. During the Third Quarter 2008 monitoring event, perchlorate was reported in one (1) groundwater sample at a concentration of 158,000 µg/L. The highest concentrations of perchlorate were detected in groundwater samples collected from monitoring wells TT-MW2-24, located in the former Liquid Waste Discharge Area and TT-MW2-14, located in Area K.

Perchlorate has not been detected in the groundwater in Area J above the MCL (6.0 µg/L). In area K, perchlorate in the groundwater has been detected as high as 79,300 µg/L (TT-MW2-17D, Second Quarter 2008). A source of perchlorate was identified in Area K. Area L, down gradient of both Areas J and K has had concentrations as high as 19,700 µg/L detected in the groundwater (TT-MW2-18, Fourth Quarter 2006). 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. Concentrations as high as 469 µg/L (TT-MW2-11, Fourth Quarter 2007) have been detected in the groundwater in Area M. The source of the perchlorate appears to be the former Liquid Waste Discharge Area. The highest concentrations of perchlorate, 158,000 µg/L (TT-MW2-24, Third Quarter 2008), have been detected at the Site in the former Liquid Waste Discharge Area which is down gradient of the operational areas (areas J, K, L, and M). Concentrations as high as 1,070 µg/L (TT-MW2-5, Fourth Quarter 2006) have been detected in the groundwater in the lower section of Laborde Canyon, down gradient of both the Operational Areas and the former Liquid Waste Discharge Area.

TCE was reported in groundwater samples from 4 of 26 and 3 of 9 locations sampled during the Second Quarter 2008 and Third Quarter 2008 monitoring events, respectively. TCE was reported in groundwater samples collected from monitoring wells TT-MW2-11, TT-MW2-17D, TT-MW2-22, and TT-MW2-24 sampled during the Second Quarter 2008 monitoring event at concentrations of 8.6, 1.1, 84, and 110

µg/L, respectively. During the Third Quarter monitoring event groundwater samples collected from monitoring wells TT-MW2-21 TT-MW2-22, and TT-MW2-24 had concentrations of 0.3, 280, and 90 µg/L, respectively. The TCE MCL of 5 µg/L was exceeded in the samples from TT-MW2-11, TT-MW2-22, and TT-MW2-24 during Second Quarter 2008 and Third Quarter 2008. Based on the data available at this time, the extent of the TCE plumes in groundwater appear to be isolated to three small areas, and it does not extend off Site.

Methylene chloride was initially reported in groundwater samples collected from TT-MW2-14 during the Fourth Quarter 2006 at a concentration of 380 µg/L. Levels of methylene chloride in TT-MW2-14 have dropped each quarter to the present concentration of 3.4 µg/L (Second Quarter 2008). Methylene chloride has also been detected in samples collected from wells located in the Former Liquid Waste Discharge Area during the Second Quarter 2008 and Third Quarter 2008 monitoring events at concentrations ranging from 0.81 to 220 µg/L, respectively; 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 two small areas, and it does not extend off Site.

During previous quarters RDX has been reported at concentrations exceeding the DWNL of 0.3 µg/L in monitoring wells TT-MW2-1 and TT-MW2-13. Additional sampling for RDX has been conducted in monitoring wells located upgradient, down gradient, and screened in a deeper interval in comparison to TT-MW2-1 and TT-MW2-13 during Third Quarter 2007 and Second Quarter 2008. RDX has not been reported above the MDL in samples from other monitoring wells. RDX was initially tested for as part of a screening for emerging contaminants.

Table 4-1 Historic Maximum and Minimum COPC Concentrations

Sample Location	Area	Perchlorate -ug/L		RDX -ug/L		Methylene Chloride -ug/L		Trichloroethene -ug/L	
		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
TT-MW2-1	L	**3000**	**11600**	ND <0.20	**1.6**	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-2	J	ND <0.46	ND <0.46	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-3	K	**740**	**68000**	ND <1.3	ND <1.3	ND <0.50	3.7	**1.2**	**8.0**
TT-MW2-4S	L	ND <0.46	ND <0.46	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-4D	L	ND <0.46	ND <0.46	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-5	LC	**810**	**1070**	ND <1.3	ND <1.3	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-6S	LC	**160**	**304**	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-6D	LC	ND <0.46	0.65	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-7	LC	**374**	**517**	ND <0.20	ND <0.20	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-7D	LC	ND <0.5	ND <0.5	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-8	LC	**274**	**519**	ND <0.20	ND <0.20	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-9S	LC	**141**	**469**	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-9D	LC	ND <0.5	**28.8**	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-10	L	ND <0.46	ND <0.46	ND <0.20	ND <0.20	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-11	M	**191**	**469**	ND <0.20	ND <0.20	ND <0.50	ND <0.50	4.4	**9.0**
TT-MW2-12	L	ND <0.46	**9.98**	ND <0.20	ND <0.20	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-13	K	**2880**	**6350**	**0.57**	**0.68**	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-14	K	**34800**	**49500**	ND <0.20	ND <0.20	3.4	**380**	ND <0.20	ND <0.20
TT-MW2-16	J	3.59	4.94	ND <0.20	ND <0.20	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-17S	K	**1900**	**5870**	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-17D	K	**38600**	**79300**	-	-	ND <0.50	ND <0.50	ND <0.20	3.2
TT-MW2-18	L	**13000**	**19700**	ND <0.20	ND <0.20	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-19S	WS	ND <0.50	ND <0.50	-	-	-	-	-	-
TT-MW2-19D	WS	ND <0.50	ND <0.50	-	-	-	-	-	-
TT-MW2-20S	WS	ND <0.50	ND <0.50	-	-	-	-	-	-
TT-MW2-20D	WS	ND <0.50	ND <0.50	-	-	-	-	-	-
TT-MW2-21	LWD -	ND <0.5	ND <0.5	-	-	ND <0.50	0.76	ND <0.20	0.30
TT-MW2-22	LWD -	ND <0.5	ND <0.5	-	-	**25**	**220**	**47**	**280**
TT-MW2-23	LWD -	ND <0.5	ND <0.5	-	-	ND <0.50	ND <0.50	ND <0.20	ND <0.20
TT-MW2-24	LWD -	**10900**	**158000**	-	-	ND <0.50	0.81	**58**	**110**
MCL (unless noted) / DWNL		6	6	0.3 (1)	0.3 (1)	5	5	5	5

Notes:

Historic period extends from September 2004 to present

μg/L - Micrograms per liter.

ND < # - Non detect, method detection limit concentration is shown.

DWNL - California Department of Health services drinking water notification level.

MCL - Maximum Contaminant Level.

(1) - DWNL

Bold - MCL exceeded.

Area Designation:

J - Final Assembly Area

K - Former Test Bay Area

L - Former Burn Area

LC - Lower Canyon

LWD - Former liquid waste discharge area

M - Garbage disposal Area

WS - Former Wolfskill property

Temporal Trend Analysis

Temporal trend analysis of perchlorate was performed on groundwater sampling results from twenty-eight (28) monitoring wells sampled between Second Quarter 2004 and Third Quarter 2008. Trends were analyzed using Mann-Kendall and the magnitude of the trends was determined using linear regression analysis.

The results of the Mann-Kendall analyses for perchlorate indicated that wells TT-MW2-1, TT-MW2-5, TT-MW2-7, TT-MW2-8, TT-MW2-11, and TT-MW2-14 displayed an increasing or probably increasing trend and wells TT-MW2-9D, TT-MW1-13 TT-MW2-17S, and TT-MW2-18 displayed a decreasing or probably deceasing trend. The remaining site wells displayed either no trend or were stable for perchlorate.

The results of the Mann-Kendall analyses for TCE indicated that well TT-MW2-11 displayed an increasing trend. The remaining site wells displayed either no trend or were stable for TCE. A summary of the Mann-Kendall and linear regression analyses is presented in Table 3-9. The relatively short time frame represented by the data analyzed makes it difficult to know the reason for the trends observed. The trends may represent plume migration. But they could have been influenced by the recent well construction or seasonal fluctuations in concentration. As the period of record grows and the number of data points grow the long term trends in perchlorate and TCE concentrations should emerge from the data.

4.3 GROUNDWATER MONITORING PROGRAM AND THE GROUNDWATER QUALITY MONITORING NETWORK

Eighteen (18) 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 continued detection of RDX above the MCL in one well, RDX has been identified as a secondary COPC. Sampling for RDX will continue to be conducted annually in monitoring wells TT-MW2-1 and TT-MW2-13. Because of the detection 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 were the water level is less then 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. Table 4-2 summarizes monitoring well classification and sampling frequency.

Table 4-2 Well Classification and Sampling Frequency

Well Classification	Frequency
Horizontal Extent Wells	Semi-annual
Vertical Distribution Wells	Semi-annual
Increasing Contaminant Trend Wells	Semi-annual
Background Wells	Annual
Remedial Monitoring Wells	Vary, based on remedial action proposed
Guard Wells	Semi-annual
New Wells	4 Quarters then reclassify
Redundant Wells	Suspend (no sampling)

Proposed changes to the analytical scheme include: eliminating perchlorate sampling in TT-MW2-2, a background monitoring well with 11 quarters of sampling results below the detection limit starting in September 2004; reducing VOC sampling to new monitoring wells and monitoring wells with historic detections and monitoring wells down gradient of areas with historic detections; reducing RDX sampling to monitoring wells TT-MW2-1, TT-MW2-13, and new wells around TT-MW2-1 and TT-MW2-13. Unfiltered metals sampling will continue to be collected from all monitored wells annually, but filtered metals will be limited to water table monitoring wells were the water level is less then 25 feet bgs.

The proposed groundwater analytical program includes the following suite of analysis:

1. Perchlorate for most groundwater samples by EPA Method 314.1; EPA Method 331.0 will be used for anion confirmation where conductivity interference may affect Method 314.1 results,,

2. VOCs including oxygenates for new wells and semiannually or annually for select groundwater samples by SW 8260B,

3. CAM 17 Metals, total, for groundwater samples by SW 6010B and SW 7470A annually until background concentrations for metals have been evaluated and the nature of the metals concentrations detected in the groundwater have been determined,

4. CAM 17 Metals, dissolved, for groundwater samples by SW 6010B and SW 7470A annually for ecological risk assessment in water table monitoring wells were the water level is less then 25 feet below ground surface or where the well screen is deeper than 25 feet below ground surface,

5. RDX annually for select groundwater samples by SW 8330,

6. Natural attenuation parameters by various methods for select wells with reduced conditions.

General mineral analysis will also be performed on selected groundwater samples to determine which HSU monitoring wells on the Site belong in. General minerals analysis will not be performed on new wells for a minimum of six (6) months after installation to allow the aquifer to stabilize. The following suite of general mineral analysis will be performed during selected groundwater sampling events:

7. Total Dissolved Solids (TDS) for groundwater samples by EPA Method 160.1,

8. Chloride, nitrate (as nitrogen) and sulfate by EPA Method 300.0, and

9. Carbonate and bicarbonate (as calcium carbonate) by EPA Method 310.1,

10. Calcium, manganese, potassium, and sodium by EPA Method 6010.

Originally, the Groundwater Well Installation and Sampling Report (May 2008) stated all wells would be sampled for NDMA during the Spring (Second Quarter) 2009 sampling event. At that time the network of monitoring wells on the Site was smaller and the bulk of the wells had been completed at the water table. At this time there are considerably more monitoring wells on Site with the majority of these new wells being completed below the water table. Keeping with the original intent, all water table monitoring wells will be sampled for NDMA during the Spring (Second Quarter) 2009 sampling event. The NDMA data will subsequently be evaluated to determine if further sampling is warranted.

Table 4-3 Monitoring Well Sampling Schedule and Frequency

Monitoring Well Location	Well Classification	VOCs (EPA 8260B)	Perchlorate (EPA 314.1)	Perchlorate (EPA 331.0)	Metals (EPA 6010B / 7470A)	RDX (EPA 8330)	Proposed Sampling Frequency	Previous Sampling Frequency
TT-MW2-1	Increasing Contaminant Trend Perchlorate		X		X	X	Semiannual – Perchlorate Annual – RDX, and metals	Semiannual – Perchlorate Annual – VOCs, metals, and RDX
TT-MW2-2	Background				X		Annual – metals	Annual – Perchlorate, metals, and VOCs
TT-MW2-3	Redundant						Suspend (no sampling)	Suspend (no sampling)
TT-MW2-4S	Vertical Distribution		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate Annual – VOCs and metals
TT-MW2-4D	Redundant						Suspend (no sampling)	Suspend (no sampling)
TT-MW2-5	Increasing Contaminant Trend Perchlorate	X	X		X		Semiannual – Perchlorate Annual – VOCs and metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-6S	Horizontal Extent	X	X		X		Semiannual – Perchlorate Annual – VOCs and metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-6D	Vertical Distribution		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-7	Increasing Contaminant Trend Perchlorate		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-7D	Vertical Distribution		X		X		Semiannual – Perchlorate Annual – metals	Quarterly – Perchlorate and VOCs Annual – metals
TT-MW2-8	Increasing Contaminant Trend Perchlorate		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-9S	Horizontal Extent	X	X		X		Semiannual – Perchlorate Annual – VOCs and metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-9D	Vertical Distribution		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-10	Horizontal Extent		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs, metals, and RDX
TT-MW2-11	Increasing Contaminant Trend Perchlorate and TCE	X	X		X		Semiannual – Perchlorate and VOCs Annual – metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-12	Vertical Distribution		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-13	Horizontal Extent	X	X		X	X	Semiannual – Perchlorate Annual – VOCs, RDX, and metals	Semiannual – Perchlorate, Annual – VOCs, metals, and RDX
TT-MW2-14	Increasing Contaminant Trend Perchlorate	X	X		X		Semiannual – Perchlorate Annual – VOCs and metals	Semiannual – Perchlorate, Annual – VOCs, metals, and RDX

Notes:

EPA- United States Environmental Protection Agency
VOCs- Volatile organic compounds
RDX - Royal Demolition Explosives

Table 4-3 Monitoring Well Sampling Schedule and Frequency (continued

Monitoring Well Location	Well Classification	VOCs (EPA 8260B)	Perchlorate (EPA 314.1)	Perchlorate (EPA 331.0)	Metals (EPA 6010B / 7470A)	RDX (EPA 8330)	Proposed Sampling Frequency	Previous Sampling Frequency
TT-MW2-16	Background		X		X		Annual – Perchlorate and metals	Annual – Perchlorate, VOCs, metals, and RDX
TT-MW2-17S	Vertical Distribution	X	X		X		Semiannual – Perchlorate Annual – VOCs and metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-17D	Horizontal Extent	X	X		X		Semiannual – Perchlorate Annual – VOCs and metals	Semiannual – Perchlorate, Annual – VOCs and metals
TT-MW2-18	Vertical Distribution		X		X		Semiannual – Perchlorate Annual – metals	Semiannual – Perchlorate, Annual – VOCs, metals, and RDX
TT-MW2-19S	New Well			X			Quarterly – Perchlorate	Quarterly – Perchlorate
TT-MW2-19D	New Well			X			Quarterly – Perchlorate	Quarterly – Perchlorate
TT-MW2-20S	New Well			X			Quarterly – Perchlorate	Quarterly – Perchlorate
TT-MW2-20D	New Well			X			Quarterly – Perchlorate	Quarterly – Perchlorate
TT-MW2-21	Horizontal Extent	X	X		X		Semiannual – Perchlorate and VOCs Annual – metals	Quarterly – Perchlorate and VOCs Annual – metals
TT-MW2-22	Horizontal Extent	X	X		X		Semiannual – Perchlorate and VOCs Annual – metals	Quarterly-Perchlorate and VOCs Annual – metals
TT-MW2-23	Horizontal Extent	X	X		X		Semiannual – Perchlorate and VOCs Annual – metals	Quarterly-Perchlorate and VOCs Annual – metals
TT-MW2-24	Horizontal Extent	X	X		X		Semiannual – Perchlorate and VOCs Annual – metals	Quarterly-Perchlorate and VOCs Annual – metals

Notes:

EPA- United States Environmental Protection Agency
VOCs- Volatile organic compounds
RDX - Royal Demolition Explosives

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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	Royal Demolition Explosives
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