Semiannual Groundwater Monitoring Report
Fourth Quarter 2009 and First Quarter 2010
Lockheed Martin Corporation, Beaumont Site 2
Beaumont, California

Prepared for:

LOCKHEED MARTIN

Prepared by:

TETRA TECH
301 E. Vanderbilt, Suite 450
San Bernardino, California 92408
TC# 25241-02.0302 / June 2010

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

August 24, 2010

Ms. Denise Kato
Remediation Analyst Senior Staff
Lockheed Martin Corporation
Energy, Environment, Safety & Health
2950 North Hollywood Way, Suite 125
Burbank, California 91505

SEMI-ANNUAL GROUNDWATER MONITORING REPORT, FOURTH QUARTER 2009 AND FIRST QUARTER 2010, LOCKHEED MARTIN CORPORATION, BEAUMONT SITE 2, BEAUMONT, CALIFORNIA (Site Code: 400261)

Dear Ms. Kato:

The Department of Toxic Substances Control (DTSC) has reviewed your responses to our comments regarding the subject groundwater monitoring report and found them to be acceptable. The subject groundwater monitoring report is approved.

Should you have any questions or comments, please contact me at (714) 484-5483.

Sincerely,

Daniel K. Zogaib
Project Manager
Brownfields and Environmental Restoration Program

cc: Mr. Gene Matsushita
Senior Manager
Environmental Remediation
Lockheed Martin Corporation
Energy, Environment, Safety & Health
2950 North Hollywood Way, Suite 125
Burbank, California 91505

Linda S Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
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August 17, 2010

Ms. Denise Kato
Remediation Analyst Senior Staff
Lockheed Martin Corporation
Energy, Environment, Safety & Health
2950 North Hollywood Way, Suite 125
Burbank, California 91505

SEMI-ANNUAL GROUNDWATER MONITORING REPORT, FOURTH QUARTER 2009 AND FIRST QUARTER 2010, LOCKHEED MARTIN CORPORATION, BEAUMONT SITE 2, BEAUMONT, CALIFORNIA (Site Code: 400261)

Dear Ms. Kato:

The Department of Toxic Substances Control (DTSC) has reviewed the subject groundwater monitoring report. Enclosed are comments from DTSC's Geological Services Unit (GSU).

Please address the enclosed GSU comments by September 17, 2010.

Should you have any questions or comments, please contact me at (714) 484-5483.

Sincerely,

Daniel K. Zogaib

Daniel K. Zogaib
Project Manager
Brownfields and Environmental Restoration Program

cc: See next page.

cc: Mr. Gene Matsushita
Senior Manager
Environmental Remediation
Lockheed Martin Corporation
Energy, Environment, Safety & Health
2950 North Hollywood Way, Suite 125
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Linda S Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

TO: Daniel Zogaib
Hazardous Substances Engineer
Brownfields and Environmental Restoration Program

FROM: Dina Kourda, CEG
Engineering Geologist
Geological Services Unit (GSU)
Cypress Office

DATE: July 28, 2010 (August 11, 2010- FINALIZED)

SUBJECT: REVIEW OF SEMIANNUAL GROUNDWATER MONITORING REPORT 4Q 2009 and 1Q 2010, LOCKHEED MARTIN CORPORATION, BEAUMONT SITE 2, BEAUMONT, CALIFORNIA, DATED JUNE 9, 2010.

PCA 11050 SITE CODE 400261-00 Tracking # 1040017

At the request of the DTSC Project Manager, Mr. Daniel Zogaib, the Geological Services Unit (GSU) has reviewed the subject document received on July 13, 2010 for Lockheed Martin Corporation, Site 2 in Beaumont.

BACKGROUND

On behalf of Lockheed Martin Corporation (LMC), Tetra Tech, Inc. (Tetra Tech) prepared the subject document, for LMC's former Beaumont Site 2 (Jack Rabbit Trail) facility (the "Site"). The Site is a 2,668-acre parcel located southwest of the city of Beaumont in San Bernardino County, California. Grand Central Rocket Company (GCR) purchased the site from the US Government in 1958. The Site was utilized for small rocket motor assembly, testing operations, propellant incineration, and minor disposal activities from 1958 to 1974, when Site closure took place under Lockheed.

According to Tetra Tech, chemicals of concern (COCs) include the following six: perchlorate, trichloroethene (TCE), methylene chloride, bis-(2-ethylhexyl) phthalate, Royal Demolition Explosives (RDX), and arsenic. Arsenic and bis-(2-ethylhexyl) phthalate were also identified, however, arsenic is a likely related to background and bis-(2-ethylhexyl) phthalate is likely a laboratory contaminant, according to Tetra Tech. Perchlorate has been identified as the primary COC. TCE, methylene chloride, and RDX are considered secondary COCs.

The subject document summarizes the results of the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events conducted at the Site.

The following comments are based on a GSU critical flaw review.

SPECIFIC COMMENTS

1. Section 3.3, Page 3-6 and Figure 3-3: Because of Site 2's unique configuration, it should be explained how horizontal flow directions are calculated. It appears that the gradient flow direction shifts slightly three times between TT-MW2-16 and TT-MW2-6S. Also, it should be specified if the groundwater gradient(s) is/are calculated site-wide or by area.

2. Section 3.6, Page 3-23: All new groundwater well construction detail/soil boring logs should be included as an appendix.

If you have any questions or comments, please do not hesitate to contact me at (714) 484-5408 or dkourda@dtsc.ca.gov.

Peer reviewed by: Greg Neal, PG

cc: Fred Zanoria, CEG, CHg

RESPONSES TO DTSC COMMENTS ON THE SEMIANNUAL GROUNDWATER MONITORING REPORT FOURTH QUARTER 2009 AND FIRST QUARTER 2010, SITE 2
LOCKHEED MARTIN, BEAUMONT, CALIFORNIA
TETRA TECH, INC
AUGUST 2010

Specific Comments		
Comment	**Response**	**Proposed Action**
1. Section 3.3, Page 3-6 and Figure 3-3: Because of Site 2's unique configuration it should be explained how horizontal flow directions are calculated. It appears that the gradient flow direction shifts slightly three times between TT-MW2-16 and TT-MW2-6S. Also, it should be specified if the groundwater gradient(s) is/are calculated site-wide or by area.	As alluded to in this comment, most of the monitoring wells at Site 2 lie essentially along a line, which precludes determination of groundwater flow direction by triangulation. The conceptual hydrogeologic model for the site suggests that shallow groundwater flow is focused within deeply weathered San Timoteo formation underlying the major canyons. This conceptual model is consistent with data showing very low to non-detectable perchlorate concentrations in monitoring wells TT-MW2-27 and TT-MW2-34A/B/C, which were installed in small side canyons off Laborde Canyon immediately south (generally downgradient) of areas with very high perchlorate concentration in groundwater. Assuming that the canyon walls approximate a no-flow boundary, the equipotential lines are drawn perpendicular to the sides of the canyons. Groundwater gradients are calculated using a segmented path approximating a flowline through the canyon. Appendix E of the report details the groundwater gradient calculation for both the entire site and individual segments along the flowline.	This will be explained in future reports.
2. Section 3.6, Page 3-23: All new groundwater well construction detail/soil boring logs should be included as an appendix.	Groundwater monitoring well construction detail and soil boring logs are included in the well installation / site characterization report that details the well installation. The well construction table located in the appendix is updated with each groundwater monitoring report.	No further action is proposed.

REFERENCES

Tetra Tech, Inc. 2010. Dynamic Site Investigation and Summary Remedial Investigation Report, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California. April.

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi, Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

August 24, 2010

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Remediation Analyst Senior Staff
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SEMI-ANNUAL GROUNDWATER MONITORING REPORT, FOURTH QUARTER 2009 AND FIRST QUARTER 2010, LOCKHEED MARTIN CORPORATION, BEAUMONT SITE 2, BEAUMONT, CALIFORNIA (Site Code: 400261)

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Should you have any questions or comments, please contact me at (714) 484-5483.

Sincerely,

Daniel K. Zogaib
Project Manager
Brownfields and Environmental Restoration Program

cc: Mr. Gene Matsushita
Senior Manager
Environmental Remediation
Lockheed Martin Corporation
Energy, Environment, Safety & Health
2950 North Hollywood Way, Suite 125
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Lockheed Martin Corporation, Shared Services
Energy, Environment, Safety and Health
2950 North Hollywood Way, Suite 125 Burbank, CA 91505
Telephone: 818.847.0197 Facsimile: 818.847.0256

LOCKHEED MARTIN

June 9, 2010

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

Subject: Submittal of the Semiannual Groundwater Monitoring Report, Fourth Quarter 2009 and First Quarter 2010, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California

Dear Mr. Zogaib:

Please find enclosed one hard copy of the body of the report and two compact disks with electronic copies of the report and appendices of the Semiannual Groundwater Monitoring Report, Fourth Quarter 2009 and First Quarter 2010, Lockheed Martin Corporation, Beaumont Site 2, Beaumont, California for your review and approval or comment.

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

Sincerely,

Denise Kato

Denise Kato
Remediation Analyst Senior Staff

Enclosure

Copy with Enc:
Gene Matsushita, LMC (CD and hard copy)
Ian Lo, Camp, Dresser, McKee (CD)
Thomas J. Villeneuve, Tetra Tech, Inc. (CD and hard copy)

BUR121 Beau 2 Q409_Q110 GWMR

Semi-annual Groundwater Monitoring Report
Fourth Quarter 2009 and First Quarter 2010
Beaumont Site 2, Beaumont, California

Prepared for:

Lockheed Martin Corporation

Prepared by:

Tetra Tech, Inc.

June 2010

Christopher Patrick
Environmental Scientist

Bill Muir, PG California (6762)
Deputy Program Manager

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Acronyms

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

LMC	Lockheed Martin Corporation
LPC	Lockheed Propulsion Company
LR	Linear Regression
LTBs	Lockheed trip blanks
MW	monitoring well
MCLs	maximum contaminant levels
MDLs	method detection limits
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
µg/L	micrograms/liter
NA	not applicable
NDMA	N-nitrosodimethylamine
NWS	National Weather Service
PW	production well
PVC	polyvinyl chloride
PZ	piezometer
QAL	Quaternary alluvium
QA/QC	quality assurance/quality control
RDX	Research Department composition X
SAP	sampling and analysis plan
SKR	Stephens' Kangaroo rat
SS	stainless steel
STF	San Timoteo formation
SVOCs	semi-volatile organic compounds

TCE	trichloroethene
1,2,3-TCP	1,2,3-trichloropropane
TOC	top of casing
TOS	top of screen
Unk.	unknown
u-DMH	unsymmetrical dimethyl hydrazine
U.S.	United States
USFWS	United States Fish and Wildlife Service
VOCs	volatile organic compounds
WCA	West Coast Analytical Services, Inc.
wSTF	weathered San Timoteo formation

SECTION 1 INTRODUCTION

This Semi-annual Groundwater Monitoring Report (Report) has been prepared by Tetra Tech, Inc. (Tetra Tech), on behalf of Lockheed Martin Corporation (LMC), and presents the results of the Fourth Quarter 2009 and First Quarter 2010 groundwater quality monitoring activities for the Beaumont Site 2 (Site) Groundwater Monitoring Program (GMP). The Site is located southwest of the City of Beaumont, Riverside County, California (Figure 1-1). Currently, the Site is inactive with the exception of ongoing investigative activities performed under Consent Order (88/89 034) with the Department of Toxic Substances Control (DTSC).

The objectives of this Report are to:

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

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

1.1 SITE BACKGROUND

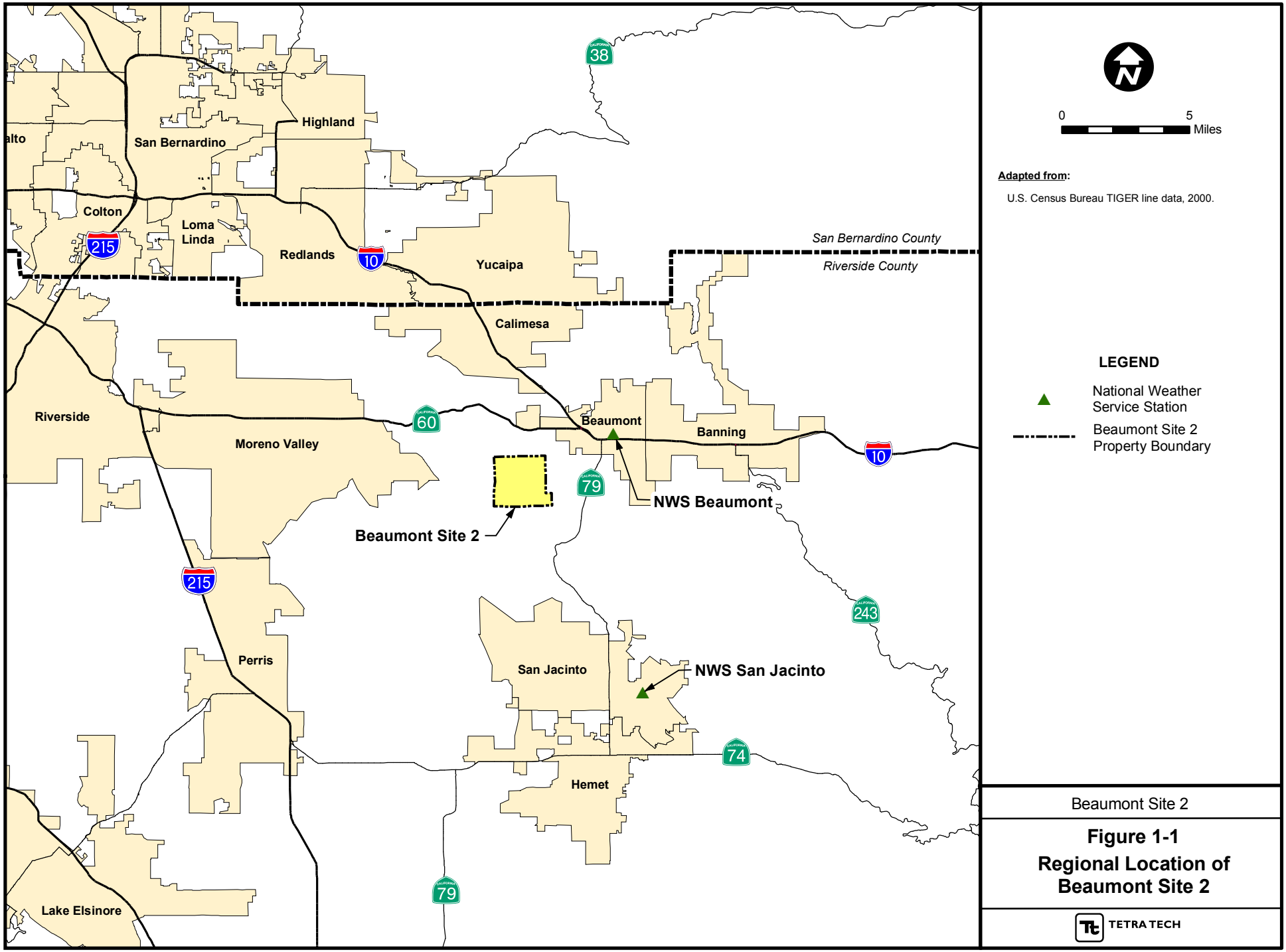
The Site is a 2,668 acre parcel located southwest of Beaumont, California. The parcels that comprise the Site were owned by individuals and the United States (U.S.) government prior to 1958. Between 1958 and 1960, portions of the Site were purchased by the Grand Central Rocket Company (GCR) and utilized 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.

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

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

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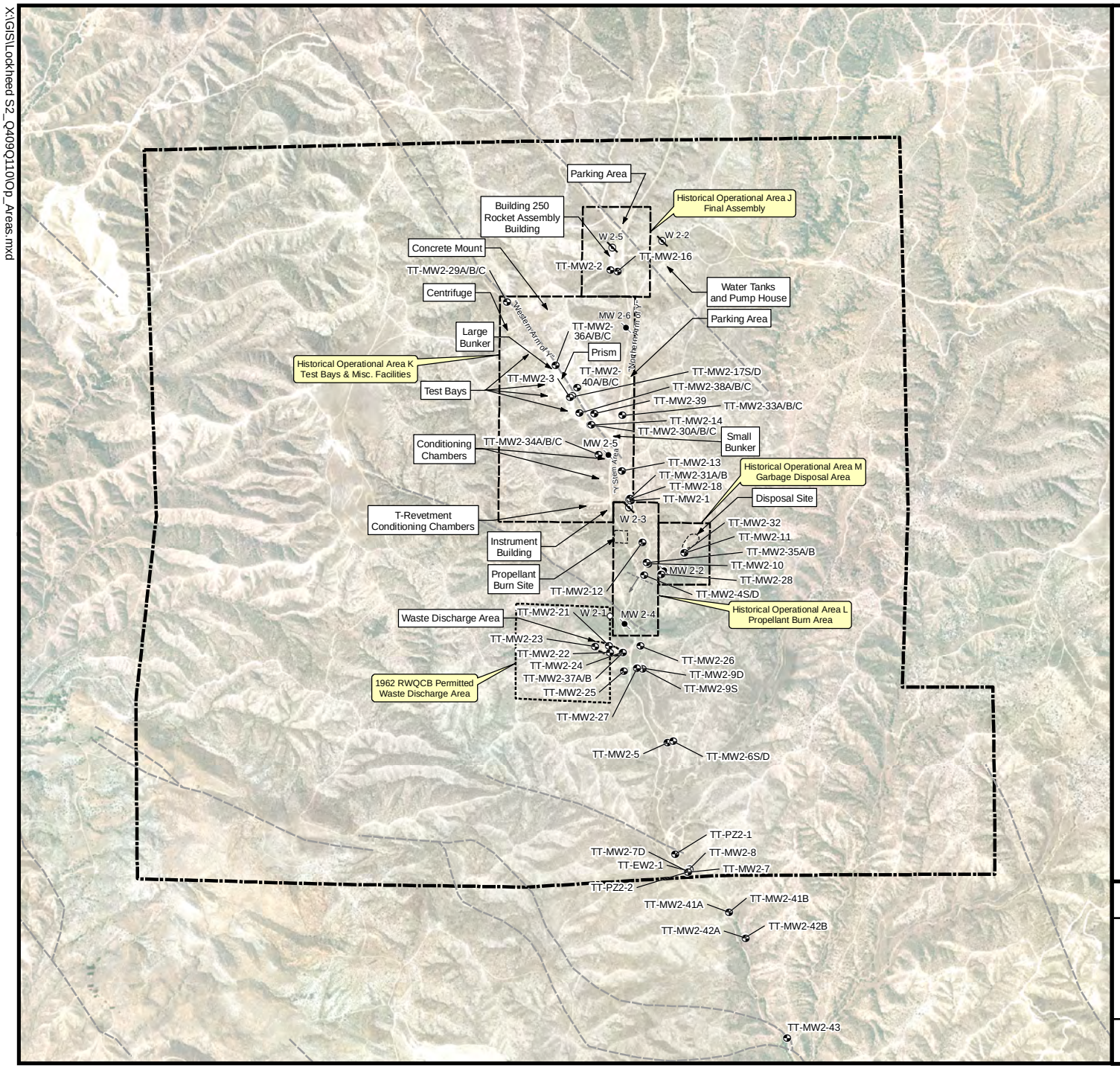

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Adapted from:

March 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Groundwater Monitoring Well Location
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

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

Beaumont Site 2

Figure 1-2
Historical Operational Areas and Site Features

TETRA TECH

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.

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 (Tetra Tech, 2009). 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,and previous site investigations (Tetra Tech, 2005; Tetra Tech, 2010b) found no evidence of significant contamination in Area L.

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.

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).

Waste Discharge Area

In 2007, LMC discovered the existence of Santa Ana River Basin Regional Water Pollution Control Board Resolution 62-24, dated September 14, 1962. Resolution 62-24 prescribed requirements for the "discharge of industrial wastes (rocket fuel residuum) to excavated pits." The discharge area was described as two shallow basins protected by two-foot berms, located in a small canyon on the western side of Laborde Canyon, in the SW ¼ of the NW ¼ of Section 19, Township 3 South, Range 1 West, San Bernardino Baseline and Meridian. Resolution 62-24 further describes the wastes to be discharged as "residue remaining after the manufacturing refuse is burned," and indicates that amount of material to be discharged was "approximately 5,000 gallons per year."

The exact nature of the waste proposed for discharge is not clear from the Resolution 62-24. The description of the waste material suggests that the area may have been used for burning propellant; but the description of the quantity of material to be discharged suggests that the waste may have

been liquid rather than solid. A 1961 aerial photograph shows the waste discharge area (WDA) as a large cleared area with roads leading to two circular structures, suggesting that the WDA was in use by 1961 (Tetra Tech, 2009a). Investigation of this area (Tetra Tech, 2007c; 2008a) found evidence for perchlorate impacts in both soil and groundwater.

Features remaining at the WDA include two roughly circular depressions surrounded by earthen berms, at the location of the circular structures identified in the 1961 aerial photograph.

SECTION 2 SUMMARY OF MONITORING ACTIVITIES

Section 2 summarizes the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events conducted at the Site. The results from these monitoring events are discussed in Section 3.

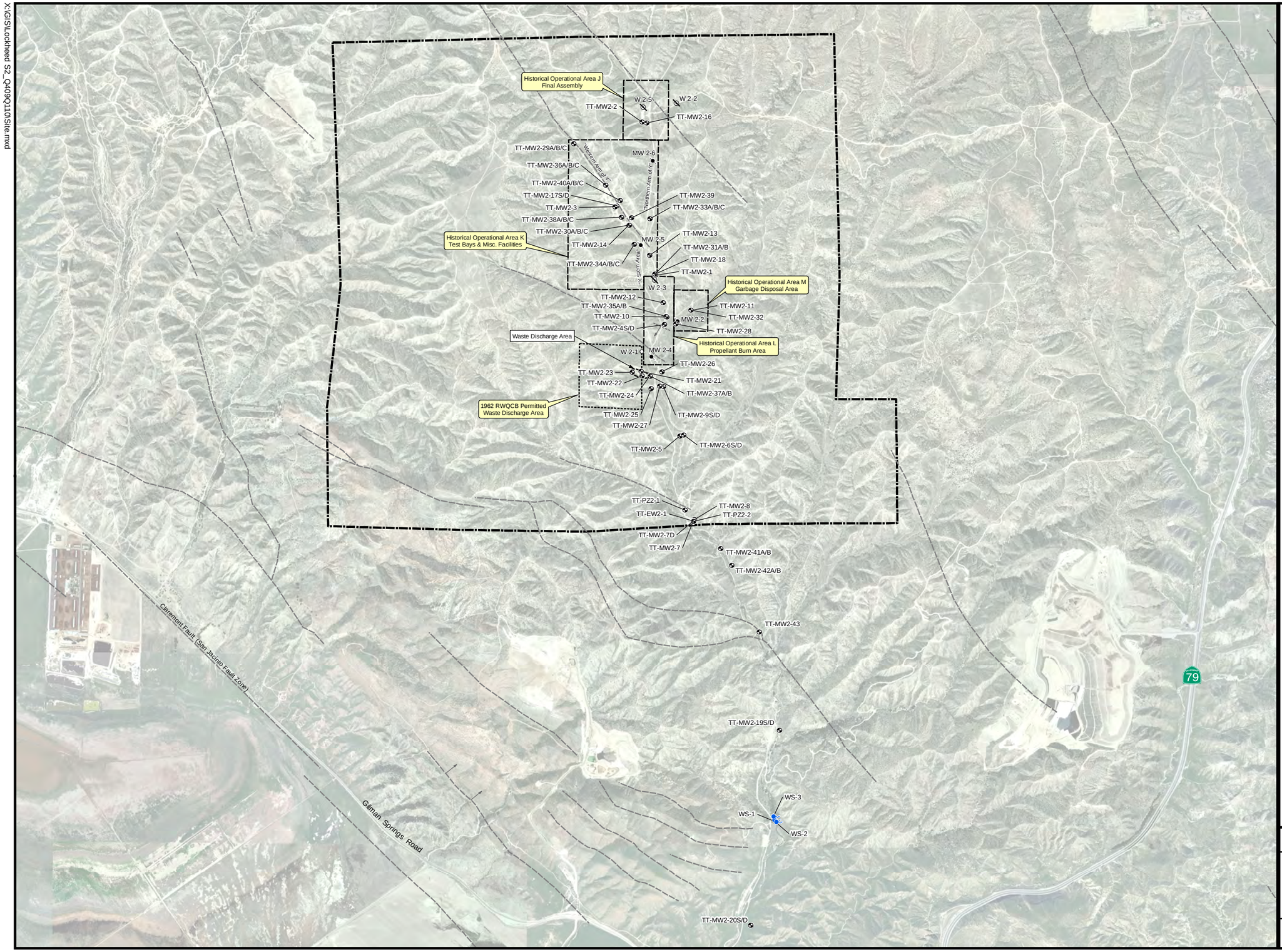
2.1 GROUNDWATER LEVEL MEASUREMENTS

The Fourth Quarter 2009 groundwater level measurements were collected from 69 monitoring wells and two piezometers on 12 December 2009. The First Quarter 2010 groundwater level measurements were collected from 69 monitoring wells and two piezometers on 15 February 2010. Two monitoring wells, TT-MW2-29A and TT-MW2-43, were found to be dry during both quarters. 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, semi-annual, 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 semi-annual events are smaller, minor events. All new wells are sampled quarterly for one year after which they are evaluated and reclassified. The semi-annual event includes, horizontal extent, vertical distribution, increasing contaminant, and guard wells, and is sampled during the second and fourth quarter of each year. In addition to the quarterly and semi-annual wells, the annual event includes background wells and takes place during the second quarter of each year. The groundwater monitoring schedule is reviewed and modified as necessary annually during the Second Quarter groundwater monitoring event. Modifications are done in accordance with the approved Groundwater Sampling and Analysis Plan (SAP) (Tetra Tech, 2007b). Fourth Quarter 2009 and First Quarter 2010 follow the schedule proposed in the Second and Third Quarter 2008 monitoring report (Tetra Tech, 2009b) which was presented to the DTSC in May 2009 and approved with no comments to the proposed schedule.

X:\GIS\Lockheed S2_Q409Q110\Site.mxd



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Adapted from:

Faults from the,*Site 2 Lineament Study, Tetra Tech, 2009.*

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- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

Beaumont Site 2

Figure 2-1

Site Map

TETRA TECH

During the Fourth Quarter 2009 monitoring event 62 groundwater samples and three surface water samples were collected between 2 December and 17 December 2009; two additional locations, TT-MW2-29A and TT-MW2-43, were dry and were not sampled. During the First Quarter 2010 monitoring event six groundwater samples and two surface water samples were collected between 16 February and 17 February 2010. Additionally, storm water samples were collected during storm events on 27 January and 6 February 2010 from 5 locations. Tables 2-1 and 2-2 list the locations monitored for the Fourth Quarter 2009 and First Quarter 2010 monitoring events, analytical methods, sampling dates, and Quality Assurance/Quality Control (QA/QC) samples collected. Figures 2-2 and 2-3 illustrate the well locations sampled for the Fourth Quarter 2009 and First Quarter 2010 monitoring events, respectively. 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.

The following water quality field parameters were measured 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). Measurement of water quality parameters was initiated when at least one 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) (or ± 10% if turbidity stabilizes at > 10 NTUs), 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 monitoring wells were purged and sampled using low-flow purging and sampling techniques with dedicated double valve sampling pumps or a portable bladder pump.

For the Fourth Quarter 2009 and First Quarter 2010 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

E. S. Babcock & Sons, Inc., a state-accredited analytical laboratory, via courier, thus maintaining proper temperatures and sample integrity. Trip blanks (LTBs) were collected on each day of the monitoring events to assess potential cross-contamination 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.

2.3 SURFACE WATER SAMPLING

Storm water locations SW-01 through SW-07 are located in the ephemeral creek bed that runs through Laborde Canyon. Storm 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. Surface water locations WS-1, WS-2 and WS-3 are spring locations on the former Wolfskill property. Water is generally present at one or more of these locations throughout the year.

During Fourth Quarter 2009, surface water samples were collected from three locations, WS-1, WS-2, and WS-3, and were analyzed for perchlorate. During First Quarter 2010, surface water samples were collected from two locations, WS-1 and WS-2, and were analyzed for perchlorate and general minerals. Additionally, storm water samples were collected from five locations, SW-02, SW-03, SW-05, SW-06, and SW-07, during storm events on 27 January and 6 February 2010. Storm water samples were analyzed for VOCs, and perchlorate. No other surface or storm water samples were collected during this reporting period. Figure 2-4 presents the surface and storm water sampling locations.

Table 2-1 Sampling Schedule and Analysis Method - Fourth Quarter 2009

Monitoring Well Location	Sample Date	VOCs (8260B)	Perchlorate (332.0)	1,4-Dioxane (8270C SIM)	Natural Attenuation Parameters	NDMA (E521)	Comments and QA /QC Samples
WS-1	12/02/09	-	X	-	-	-	Spring Sample
WS-2	12/02/09	-	X	-	-	-	Spring Sample
WS-3	12/02/09	-	X	-	-	-	Spring Sample
TT-MW2-1	12/09/09	-	X	-	X	-	Sample with Dedicated Pump, MS/MSD
TT-MW2-4S	12/04/09	-	X	-	-	-	Sample with Dedicated Pump
TT-MW2-5	12/3/2009 - 12/5/2009	-	X	X	X	-	Sample with Dedicated Pump
TT-MW2-6S	12/03/09	-	X	-	-	-	Sample with Dedicated Pump
TT-MW2-6D	12/03/09	-	X	-	-	-	Sample with Dedicated Pump
TT-MW2-7	12/03/09	-	X	-	X	-	Sample with Dedicated Pump
TT-MW2-7D	12/03/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-8	12/03/09	-	X	-	-	-	Sample with Dedicated Pump, Duplicate TT-MW2-8-Dup
TT-MW2-9S	12/08/09	-	X	X	X	-	Sample with Dedicated Pump
TT-MW2-9D	12/04/09	-	X	-	-	-	Sample with Dedicated Pump
TT-MW2-10	12/09/09	-	X	-	X	-	Sample with Dedicated Pump
TT-MW2-11	12/04/09	X	X	-		-	Sample with Dedicated Pump, Duplicate TT-MW2-11-Dup
TT-MW2-12	12/14/09	-	X	-	X	-	Sample with Dedicated Pump
TT-MW2-13	12/14/09	-	X	-	-	-	Sample with Dedicated Pump, Duplicate TT-MW2-13-Dup
TT-MW2-14	12/14/09	-	X	-	X	-	Sample with Dedicated Pump
TT-MW2-17S	12/17/09	-	X	-	-	-	Sample with Dedicated Pump
TT-MW2-17D	12/10/09	-	X	-	X	-	Sample with Dedicated Pump
TT-MW2-18	12/14/09	-	X	-	-	-	Sample with Dedicated Pump
TT-MW2-19S	12/11/09	-	X	X	-	X	Sample with Dedicated Pump, MS/MSD
TT-MW2-19D	12/02/09	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-20S	12/02/09	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-20D	12/02/09	-	X	-	-	X	Sample with Dedicated Pump
TT-MW2-21	12/04/09	X	X	X	-	X	Sample with Dedicated Pump
TT-MW2-22	12/04/09	X	X	X	-	-	Sample with Dedicated Pump, Duplicate TT-MW2-22-Dup
TT-MW2-23	12/11/09	X	X	-	X	-	Sample with Dedicated Pump
TT-MW2-24	12/11/09	X	X	X	X	X	Sample with Dedicated Pump, Duplicate TT-MW2-24-Dup
TT-MW2-25	12/04/09	X	X	-	-	X	Sample with Dedicated Pump
TT-MW2-26	12/04/09	X	X	X	-	X	Sample with Dedicated Pump
TT-MW2-27	12/03/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-28	12/04/09	X	X	-	-	X	Sample with Dedicated Pump
TT-MW2-29A	NA	-	-	-	-	-	Dry Well
Fourth Quarter 2009: Sample Locations:							67
Total Samples Collected:							65

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

Table 2 1 Sampling Schedule and Analysis Method - Fourth Quarter 2009 (continued)

Monitoring Well Location	Sample Date	VOCs (8260B)	Per chlorate (332.0)	1,4-Dioxane (8270C SIM)	Natural Attenuation Parameters	NDMA (E521)	Comments and QA /QC Samples
TT-MW2-29B	12/07/09	X	X	-	-	X	Sample with Dedicated Pump
TT-MW2-29C	12/07/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-30A	12/14/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-30B	12/11/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-30C	12/11/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-31A	12/09/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-31B	12/09/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-32	12/09/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-33A	12/11/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-33B	12/15/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-33C	12/15/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-34A	12/15/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-34B	12/15/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-34C	12/15/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-35A	12/09/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-35B	12/09/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-36A	12/10/09	X	X	-	X	X	Sample with Dedicated Pump, Duplicate TT-MW2-36A-Dup
TT-MW2-36B	12/10/09	X	X	-	-	-	Sample with Dedicated Pump, MS/MSD
TT-MW2-36C	12/10/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-37A	12/08/09	X	X	X	-	-	Sample with Dedicated Pump
TT-MW2-37B	12/08/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-38A	12/14/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-38B	12/17/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-38C	12/14/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-39	12/15/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-40A	12/10/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-40B	12/10/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-40C	12/10/09	X	X	-	-	-	Sample with Dedicated Pump
TT-MW2-41A	12/16/09	X	X	X	-	X	Sample with Dedicated Pump
TT-MW2-41B	12/16/09	X	X	X	-	X	Sample with Portable Bladder Pump
TT-MW2-42A	12/16/09	X	X	X	-	X	Sample with Portable Bladder Pump
TT-MW2-42B	12/16/09	X	X	X	-	X	Sample with Portable Bladder Pump
TT-MW2-43	NA	-	-	-	-	-	Dry Well
Fourth Quarter 2009: Sample Locations:							67
Total Samples Collected:							65

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

Table 2-2 Sampling Schedule and Analysis Method - First Quarter 2010

Monitoring Well Location	Sample Date	VOCs (EPA 8260B)	Perchlorate (EPA 331.0)	Ca, Mg, K, Na (SW6010B)	Total Dissolved Solids (E 160.1)	Chloride, Nitrate, Sulfate (E 300.0)	Carbonate, Bicarbonate (E310.1)	Comments and QA /QC Samples
WS-1	2/16/2010	-	X	X	X	X	X	Spring Sample, MSMSD, Duplicate WS-1-Dup
WS-2	2/16/2010	-	X	X	X	X	X	Spring Sample
WS-3	NA	-	-	-	-	-	-	Mud
SW-01	NA	-	-	-	-	-	-	Dry
SW-02	2/6/2010	X	X	-	-	-	-	Stom Water Sample
SW-03	2/6/2010	X	X	-	-	-	-	Stom Water Sample
SW-04	NA	-	-	-	-	-	-	Dry
SW-05	02/06/10	X	X	-	-	-	-	Stom Water Sample
SW-06	02/06/10	X	X	-	-	-	-	Stom Water Sample
SW-07	01/27/10	X	X	-	-	-	-	Stom Water Sample
TT-MW2-19S	02/16/10	-	X	-	-	-	-	Sample with Portable Bladder Pump, Duplicate TT-MW2-19S-Dup
TT-MW2-19D	02/16/10	-	X	-	-	-	-	Sample with Dedicated Pump
TT-MW2-20S	02/16/10	-	X	-	-	-	-	Sample with Dedicated Pump
TT-MW2-20D	02/16/10	-	X	-	-	-	-	Sample with Dedicated Pump
TT-MW2-41A	02/17/10	-	X	-	-	-	-	Sample with Dedicated Pump
TT-MW2-42A	02/17/10	-	X	-	-	-	-	Sample with Portable Bladder Pump
TT-MW2-43	NA	-	-	-	-	-	-	Dry
First Quarter 2010: Total Sample Locations:								17
Total Samples Collected:								13

Notes:
EPA - United States Environmental Protection Agency.
QA/QC - Quality assurance / quality control
MS / MSD- Matrix Spike / Matrix Spike Duplicate.
"-" Not analyzed
VOCs - Volatile Organic Compounds
NA - Not available.
Ca - Calcium
Mg - Magnesium
K - Potassium
Na - Sodium

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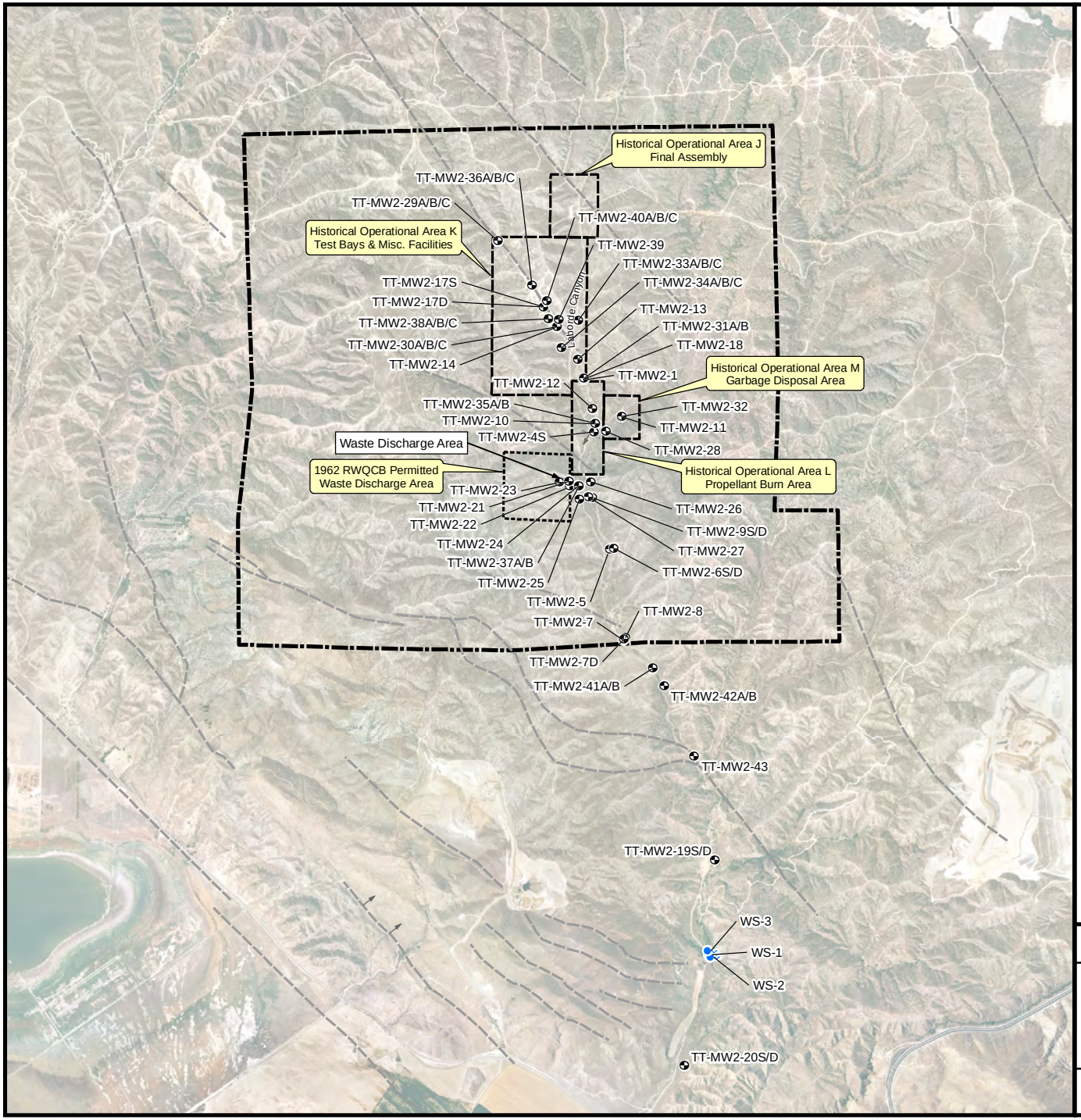

0 1,500 3,000 Feet

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Groundwater Monitoring Well
- Spring
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

Beaumont Site 2

Figure 2-2

Fourth Quarter 2009 Sample Locations

TETRA TECH

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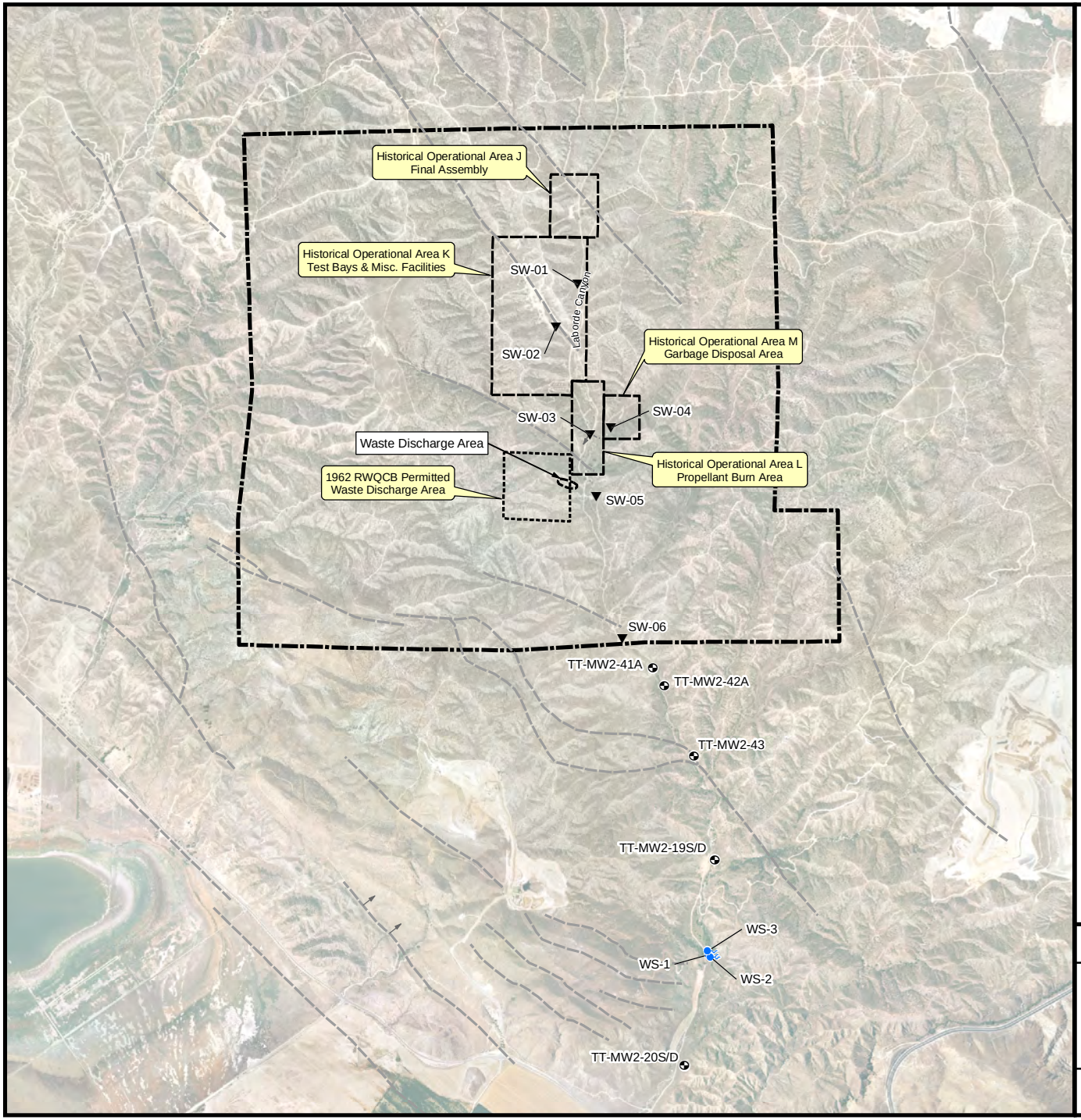

0 1,500 3,000
Feet

Adapted from:

April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

LEGEND

- Groundwater Monitoring Well
- Surface Water Sample
- Spring
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

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

Beaumont Site 2

Figure 2-3

First Quarter 2010 Sample Locations

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
Water Tanks and Pump House
Concrete Mount
Centrifuge
Large Bunker
Historical Operational Area K Test Bays & Misc. Facilities
SW-01 (Dry)
Prism
Parking Area
4 Test Bays
SW-02
Small Bunker
Conditioning Chambers
T-Revetment Conditioning Chambers
Historical Operational Area M Garbage Disposal Area
Instrument Building
Disposal Site
Reported Propellant Burn Site
SW-04 (Dry)
SW-03
Historical Operational Area L Propellant Burn Area
Waste Discharge Area
SW-05
1962 RWQCB Permitted Waste Discharge Area
SW-06
WS-3 (Dry)
WS-1
WS-2
SW-07
See inset map for southern sample locations

LEGEND

- Spring Sampling Location
- Surface Water Sampling Location
- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

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

Faults from the,*Site 2 Lineament Study, Tetra Tech, 2009.*

Beaumont Site 2

Figure 2-4

Surface and Storm Water Sampling Locations

TETRA TECH

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, 2004 and EPA, 2008).

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.

SECTION 3 GROUNDWATER MONITORING RESULTS

The results of the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events are presented in the following subsections. These subsections include tabulated summaries of the groundwater elevation and water quality data, groundwater elevation maps, and analyte results figures.

3.1 GROUNDWATER ELEVATION

Based on the groundwater levels measured during the Fourth Quarter 2009 and First Quarter 2010 monitoring events, groundwater elevations at the Site range from about 2,075 feet msl at TT-MW2-16, located in the northern portion of the Site, to about 1,819 feet msl at TT-MW2-8, located in the southern portion of the Site. Depth to groundwater ranged from about 118 feet bgs at TT-MW2-29B to about 15 feet bgs at TT-MW2-8. A tabulated summary of groundwater depths and elevations is presented in Table 3-1. Changes in groundwater elevations from the previous monitoring event for wells monitored for the Fourth Quarter 2009 and First Quarter 2010 monitoring events are shown on Figures 3-1 and 3-2, respectively, and hydrographs for individual wells are presented in Appendix D.

When compared to Third Quarter 2009, groundwater elevation during Fourth Quarter 2009 decreased an average of 0.16 feet. When compared to Fourth Quarter 2009, groundwater elevation during First Quarter 2010 increased an average of 0.30 feet. Changes in groundwater elevations by area for wells monitored for the Fourth Quarter 2009 and First Quarter 2010 monitoring events are shown in Table 3-2.

Table 3-1 Groundwater Elevation Data - Fourth Quarter 2009 and First Quarter 2010

Well ID	Measuring Point Elevation (feet msl)	Fourth Quarter 2009				First Quarter 2010			
		Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Third Quarter 2009 (feet)	Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Fourth Quarter 2009 (feet)
TT-EW2-1	1840.24	12/01/09	22.27	1817.97	NA	02/15/10	20.90	1819.34	1.37
TT-MW2-1	2035.21	12/01/09	57.97	1977.24	-0.33	02/15/10	58.21	1977.00	-0.24
TT-MW2-2	2137.75	12/01/09	70.25	2067.50	-0.04	02/15/10	70.29	2067.46	-0.04
TT-MW2-3	2094.66	12/01/09	70.55	2024.11	-0.04	02/15/10	70.65	2024.01	-0.10
TT-MW2-4S	1986.94	12/01/09	50.86	1936.08	-0.12	02/15/10	50.80	1936.14	0.06
TT-MW2-4D	1987.17	12/01/09	58.05	1929.12	-0.17	02/15/10	57.80	1929.37	0.25
TT-MW2-5	1911.31	12/01/09	40.16	1871.15	-0.13	02/15/10	39.65	1871.66	0.51
TT-MW2-6S	1908.00	12/01/09	36.71	1871.29	-0.16	02/15/10	35.63	1872.37	1.08
TT-MW2-6D	1908.07	12/01/09	37.67	1870.40	-0.16	02/15/10	36.78	1871.29	0.89
TT-MW2-7	1839.25	12/01/09	21.52	1817.73	-0.80	02/15/10	20.22	1819.03	1.30
TT-MW2-7D	1838.96	12/01/09	19.00	1819.96	-0.74	02/15/10	17.95	1821.01	1.05
TT-MW2-8	1836.32	12/01/09	18.21	1818.11	-0.05	02/15/10	16.90	1819.42	1.31
TT-MW2-9S	1938.38	12/01/09	39.35	1899.03	-0.85	02/15/10	39.30	1899.08	0.05
TT-MW2-9D	1938.78	12/01/09	43.24	1895.54	-0.34	02/15/10	42.91	1895.87	0.33
TT-MW2-10	2001.57	12/01/09	57.83	1943.74	-0.26	02/15/10	57.78	1943.79	0.05
TT-MW2-11	2004.51	12/01/09	49.88	1954.63	-0.13	02/15/10	49.84	1954.67	0.04
TT-MW2-12	2016.26	12/01/09	50.85	1965.41	-0.10	02/15/10	50.91	1965.35	-0.06
TT-MW2-13	2049.39	12/01/09	66.59	1982.80	-0.10	02/15/10	66.69	1982.70	-0.10
TT-MW2-14	2074.78	12/01/09	66.31	2008.47	-0.24	02/15/10	66.55	2008.23	-0.24
TT-MW2-16	2137.20	12/01/09	62.20	2075.00	-0.40	02/15/10	62.34	2074.86	-0.14
TT-MW2-17S	2095.55	12/01/09	71.25	2024.30	0.06	02/15/10	71.39	2024.16	-0.14
TT-MW2-17D	2095.33	12/01/09	71.45	2023.88	-0.04	02/15/10	71.38	2023.95	0.07
TT-MW2-18	2035.32	12/01/09	57.88	1977.44	-0.31	02/15/10	58.11	1977.21	-0.23
TT-MW2-19S	1698.34	12/01/09	45.42	1652.92	0.43	02/15/10	45.58	1652.76	-0.16
TT-MW2-19D	1698.37	12/01/09	26.36	1672.01	-1.45	02/15/10	24.60	1673.77	1.76
TT-MW2-20S	1587.77	12/01/09	34.54	1553.23	-0.44	02/15/10	34.88	1552.89	-0.34
TT-MW2-20D	1587.48	12/01/09	33.79	1553.69	-0.48	02/15/10	34.09	1553.39	-0.30
TT-MW2-21	1978.45	12/01/09	66.32	1912.13	0.02	02/15/10	66.36	1912.09	-0.04
TT-MW2-22	1975.86	12/01/09	65.14	1910.72	0.08	02/15/10	65.19	1910.67	-0.05
TT-MW2-23	1995.17	12/01/09	82.94	1912.23	-0.09	02/15/10	82.96	1912.21	-0.02
TT-MW2-24	1964.26	12/01/09	53.78	1910.48	0.09	02/15/10	53.74	1910.52	0.04
TT-MW2-25	1966.96	12/01/09	63.96	1903.00	0.05	02/15/10	64.02	1902.94	-0.06
TT-MW2-26	1944.43	12/01/09	38.19	1906.24	-0.68	02/15/10	37.51	1906.92	0.68
TT-MW2-27	1948.27	12/01/09	50.25	1898.02	-0.84	02/15/10	50.15	1898.12	0.10
TT-MW2-28	1995.65	12/01/09	62.02	1933.63	-0.84	02/15/10	61.79	1933.86	0.23
TT-MW2-29A	2147.77	12/01/09	Dry	Dry	NA	02/15/10	Dry	Dry	NA

Notes:
NA - Not applicable
msl - Mean sea level
#.## - Denotes an increase in groundwater elevation
- #.## - Denotes a decrease in groundwater elevation

Table 3-1 Groundwater Elevation Data - Fourth Quarter 2009 and First Quarter 2010 (Continued)

Well ID	Measuring Point Elevation (feet msl)	Fourth Quarter 2009				First Quarter 2010			
		Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Third Quarter 2009 (feet)	Date Measured	Depth to Water (from Measuring Point, feet)	Groundwater Elevation (feet msl)	Groundwater Elevation Change from Fourth Quarter 2009 (feet)
TT-MW2-29B	2147.90	12/01/09	121.60	2026.30	0.35	02/15/10	121.82	2026.08	-0.22
TT-MW2-29C	2147.83	12/01/09	127.71	2020.12	0.10	02/15/10	127.60	2020.23	0.11
TT-MW2-30A	2074.37	12/01/09	72.95	2001.42	0.13	02/15/10	72.93	2001.44	0.02
TT-MW2-30B	2074.41	12/01/09	75.43	1998.98	0.04	02/15/10	75.28	1999.13	0.15
TT-MW2-30C	2074.35	12/01/09	77.68	1996.67	0.08	02/15/10	77.63	1996.72	0.05
TT-MW2-31A	2036.11	12/01/09	58.86	1977.25	-0.22	02/15/10	59.04	1977.07	-0.18
TT-MW2-31B	2036.15	12/01/09	66.61	1969.54	-0.07	02/15/10	66.25	1969.90	0.36
TT-MW2-32	2004.87	12/01/09	53.69	1951.18	-0.12	02/15/10	53.58	1951.29	0.11
TT-MW2-33A	2070.54	12/01/09	61.22	2009.32	0.04	02/15/10	61.21	2009.33	0.01
TT-MW2-33B	2070.54	12/01/09	65.95	2004.59	0.08	02/15/10	65.95	2004.59	0.00
TT-MW2-33C	2070.54	12/01/09	64.05	2006.49	0.12	02/15/10	64.02	2006.52	0.03
TT-MW2-34A	2066.84	12/01/09	65.97	2000.87	-0.06	02/15/10	66.04	2000.80	-0.07
TT-MW2-34B	2066.85	12/01/09	73.15	1993.70	-0.05	02/15/10	73.11	1993.74	0.04
TT-MW2-34C	2066.84	12/01/09	74.77	1992.07	-0.01	02/15/10	74.70	1992.14	0.07
TT-MW2-35A	2003.20	12/01/09	49.59	1953.61	0.12	02/15/10	49.08	1954.12	0.51
TT-MW2-35B	2003.20	12/01/09	55.05	1948.15	0.02	02/15/10	54.75	1948.45	0.30
TT-MW2-36A	2100.99	12/01/09	79.01	2021.98	0.09	02/15/10	78.97	2022.02	0.04
TT-MW2-36B	2101.04	12/01/09	79.78	2021.26	0.02	02/15/10	79.75	2021.29	0.03
TT-MW2-36C	2100.88	12/01/09	79.76	2021.12	0.04	02/15/10	79.75	2021.13	0.01
TT-MW2-37A	1963.62	12/01/09	63.25	1900.37	-0.24	02/15/10	62.98	1900.64	0.27
TT-MW2-37B	1963.67	12/01/09	71.26	1892.41	-0.15	02/15/10	70.94	1892.73	0.32
TT-MW2-38A	2084.56	12/01/09	59.48	2025.08	-0.29	02/15/10	59.63	2024.93	-0.15
TT-MW2-38B	2084.42	12/01/09	81.45	2002.97	0.05	02/15/10	81.35	2003.07	0.10
TT-MW2-38C	2084.63	12/01/09	88.90	1995.73	0.05	02/15/10	88.76	1995.87	0.14
TT-MW2-39	2079.53	12/01/09	61.95	2017.58	-0.74	02/15/10	61.81	2017.72	0.14
TT-MW2-40A	2096.28	12/01/09	72.48	2023.80	-0.03	02/15/10	72.56	2023.72	-0.08
TT-MW2-40B	2096.24	12/01/09	83.82	2012.42	0.03	02/15/10	83.77	2012.47	0.05
TT-MW2-40C	2096.28	12/01/09	88.88	2007.40	0.12	02/15/10	88.71	2007.57	0.17
Tt-MW2-41A	1812.47	12/01/09	23.90	1788.57	NA	02/15/10	21.92	1790.55	1.98
Tt-MW2-41B	1812.22	12/01/09	21.06	1791.16	NA	02/15/10	18.56	1793.66	2.50
Tt-MW2-42A	1799.06	12/01/09	28.02	1771.04	NA	02/15/10	26.24	1772.82	1.78
Tt-MW2-42B	1799.07	12/01/09	25.60	1773.47	NA	02/15/10	24.32	1774.75	1.28
Tt-MW2-43	1771.44	12/01/09	Dry	Dry	NA	02/15/10	Dry	Dry	NA
TT-PZ2-1	1847.06	12/01/09	19.91	1827.15	-0.27	02/15/10	19.15	1827.91	0.76
TT-PZ2-2	1840.76	12/01/09	22.40	1818.36	NA	02/15/10	20.97	1819.79	1.43

Notes:
NA - Not applicable
msl - Mean sea level
#.## - Denotes an increase in groundwater elevation
- #.## - Denotes a decrease in groundwater elevation

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Parking Area
Historical Operational Area J Final Assembly
Building 250 Rocket Assembly Building
Transformer Pad
Water Tanks and Pump House
TT-MW2-2
TT-MW2-16
TT-MW2-29C
TT-MW2-29B
TT-MW2-29A
Concrete Mount
Centrifuge
Prism
Large Bunker
Historical Operational Area K Test Bays & Misc. Facilities
TT-MW2-36A
TT-MW2-36C
TT-MW2-36B
TT-MW2-40C
TT-MW2-40B
TT-MW2-17S
TT-MW2-40A
Parking Area
4 Test Bays
TT-MW2-3
TT-MW2-39
TT-MW2-17D
TT-MW2-33B
TT-MW2-33C
TT-MW2-38A
TT-MW2-14
TT-MW2-38C
TT-MW2-38B
TT-MW2-33A
TT-MW2-30C
TT-MW2-30B
TT-MW2-30A
Small Bunker
TT-MW2-34A
TT-MW2-34B
TT-MW2-34C
Conditioning Chambers
TT-MW2-13
Instrument Building
T-Revetment Conditioning Chambers
TT-MW2-31B
TT-MW2-31A
TT-MW2-1
Reported Propellant Burn Site
TT-MW2-18
TT-MW2-32
Disposal Site
TT-MW2-12
TT-MW2-35B
TT-MW2-11
TT-MW2-35A
TT-MW2-10
TT-MW2-28
TT-MW2-4D
TT-MW2-4S
1962 RWQCB Permitted Waste Discharge Area
Historical Operational Area M Garbage Disposal Area
Waste Discharge Area
Historical Operational Area L Propellant Burn Area
TT-MW2-21
TT-MW2-27
TT-MW2-26
TT-MW2-37A
TT-MW2-24
TT-MW2-23
TT-MW2-22
TT-MW2-9D
TT-MW2-7B
TT-MW2-9S
TT-MW2-25
TT-MW2-6D
TT-MW2-6S
TT-MW2-5
TT-MW2-19D
TT-MW2-19S
TT-MW2-20S
TT-MW2-20D
TT-PZ2-1
TT-MW2-7
TT-EW2-1
TT-PZ2-2
TT-MW2-8
TT-MW2-7D
TT-MW2-41A
TT-MW2-41B
TT-MW2-42A
TT-MW2-42B
TT-MW2-43
See inset map for southern sample locations

LEGEND

- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary
- Groundwater Elevation Change not Available

Groundwater Elevation Change
(compared to previous quarter groundwater elevations)

DECREASING		INCREASING
	0 to 0.50	
	0.51 to 1.00	
	1.01 to 1.50	

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

0 500 1,000 Feet

Beaumont Site 2

Figure 3-1

Fourth Quarter 2009 Changes in Groundwater Elevations

TETRA TECH

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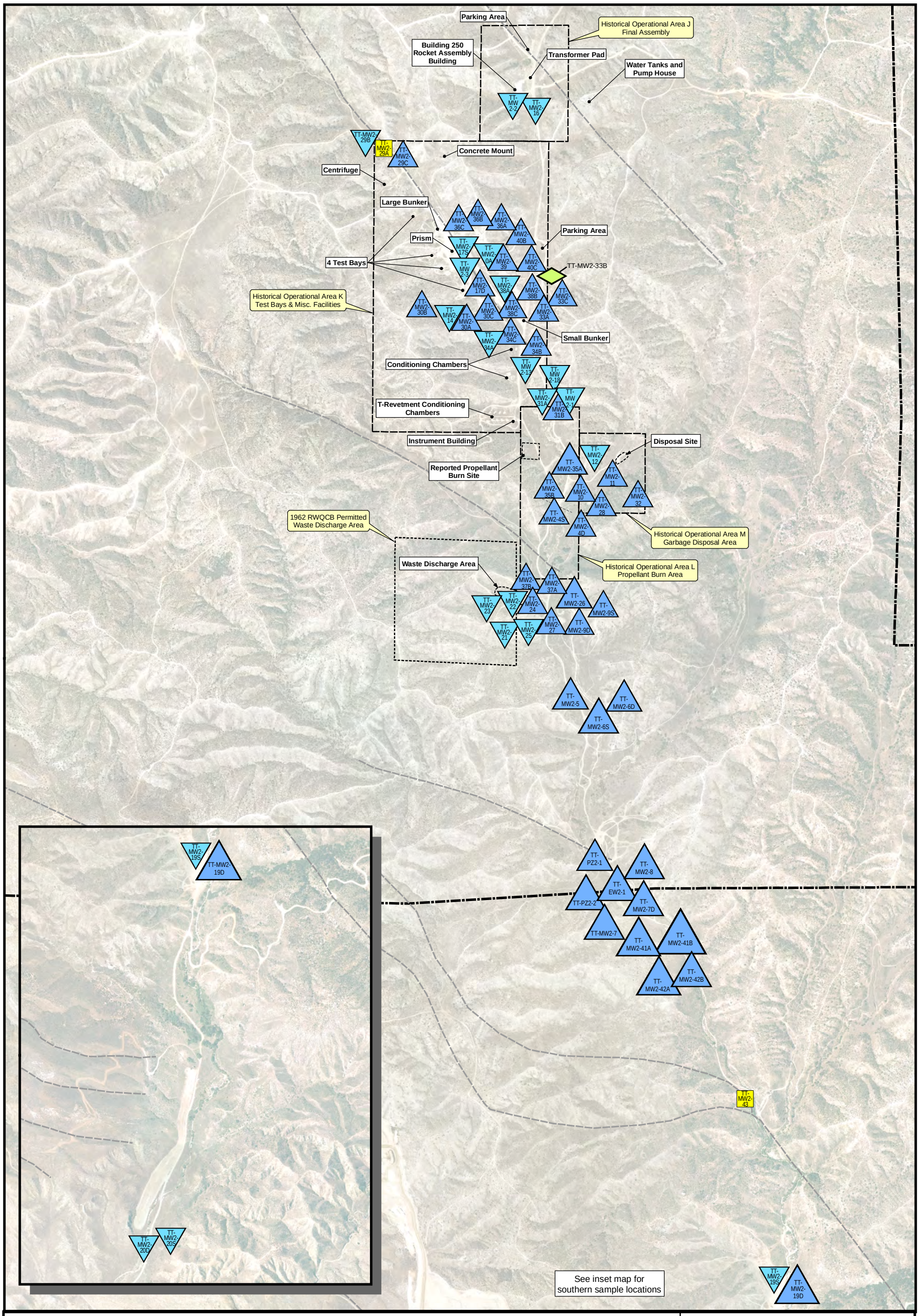

LEGEND

- Fault, Accurately Located Showing Dip
- Fault, Approximately Located
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary
- No Groundwater Elevation Change
- Groundwater Elevation Change not Available

Groundwater Elevation Change
(compared to previous quarter groundwater elevations)

DECREASING	INCREASING
0 to 0.50	
0.51 to 1.00	
1.01 to 1.50	
1.51 to 2.00	
1.51 to 2.00	

Adapted from: April 2007 aerial photograph.

Faults from the,*Site 2 Lineament Study, Tetra Tech, 2009.*

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

0 500 1,000 Feet

N

Beaumont Site 2

Figure 3-2

First Quarter 2010 Changes in Groundwater Elevations

TETRA TECH

Table 3-2 Groundwater Elevation Change - Fourth Quarter 2009 and First Quarter 2010

Site Area	Range of Groundwater Elevation Change - Fourth Quarter 2009		Average Change By Area	Range of Groundwater Elevation Change - First Quarter 2010		Average Change By Area
J	-0.40	-0.04	-0.22	-0.14	-0.04	-0.09
K	-0.74	0.35	-0.04	-0.24	0.36	-0.01
L	-0.26	0.12	-0.08	-0.06	0.51	0.19
M	-0.84	-0.12	-0.36	0.04	0.23	0.13
FWDA	-0.24	0.09	-0.05	-0.05	0.32	0.09
LC	-0.85	0.05	-0.41	-0.06	2.50	1.02
WS	-1.45	0.43	-0.48	-0.34	1.76	0.24

Notes:

J - Final Assembly Area
K - Former Test Bay Area
L - Former Burn Area
M - Garbage disposal Area
FWDA - Former waste discharge area
LC - Lower Canyon
WS - Former Wolfskill property

3.2 GROUNDWATER FLOW

Groundwater contour maps for first groundwater screened wells from Fourth Quarter 2009 and First Quarter 2010 groundwater levels are presented in Figure 3-3 and Figures 3-4 respectively. Hydrographs for individual wells are presented in Appendix D.

3.3 GROUNDWATER GRADIENTS

The average horizontal groundwater gradients calculated between TT-MW2-16 and TT-MW2-6S from the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events for the shallow Quaternary Alluvium and weathered San Timoteo Formation (QAL/wSTF) screened wells were 0.030 ft/ft. The horizontal groundwater gradients calculated between TT-MW2-2 and TT-MW2-6D for the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events for the deeper San Timoteo Formation (STF) screened wells were 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 -0.28 at well cluster TT-MW2-4S and 4D located in Area L to +0.19 at well cluster TT-MW2-19S and 19D located on the former Wolfskill property. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-3. A complete listing of historical horizontal and vertical groundwater gradients and associated calculations is presented in Appendix E.

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
W 2-2
W 2-5
Water Tanks and Pump House
TT-MW2-16 2075.00'
Concrete Mount
2060
Centrifuge
MW 2-6
Large Bunker
Historical Operational Area K Test Bays & Misc. Facilities
TT-MW2-17D 2023.88'
2040
Parking Area
Prism
TT-MW2-17S 2024.30'
4 Test Bays
TT-MW2-3 2024.11'
2020
TT-MW2-39 2017.58'
TT-MW2-33A 2009.32'
TT-MW2-38A 2025.08'
2020
Small Bunker
2000
TT-MW2-14 2008.47'
MW 2-5
Conditioning Chambers
TT-MW2-13 1982.80'
1980
W 2-3
T-Revetment Conditioning Chambers
Disposal Area
Instrument Building
1960
TT-MW2-11 1954.63'
Reported Propellant Burn Site
Historical Operational Area M Garbage Disposal Area
TT-MW2-10 1943.74'
1940
MW 2-2
TT-MW2-28 1933.63'
1962 RWQCB Permitted Discharge Area
Historical Operational Area L Propellant Burn Area
W 2-1
MW 2-4
1920
Waste Discharge Area
TT-MW2-26 1906.24'
TT-MW2-24 1910.48'
1900
TT-MW2-9S 1899.03'
TT-MW2-27 1898.02'
1880
TT-MW2-5 1871.15'
TT-MW2-6S 1871.29'
1860
1840
TT-PZ2-1 1827.15'
1820
TT-MW2-8 1818.11'
TT-EW2-1 1817.97'
TT-MW2-7 1817.73'
1800
TT-MW2-41A 1788.57'
1780
TT-MW2-42A 1771.04'
1760
1740
1720
TT-MW2-43 Dry
1700
1680
1660
TT-MW2-19S 1652.76'
See inset map for southern sample locations

1660
TT-MW2-19S 1652.76'
1640
1620
1600
1580
1560
TT-MW2-20S 1552.56'

LEGEND

- Monitoring Well Location with Groundwater Elevation (feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

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

20-foot groundwater interval.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-3

Fourth Quarter 2009 Groundwater Contours for First Groundwater

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
W 2-2
W 2-5
Water Tanks and Pump House
TT-MW2-16 2074.86'
Concrete Mount
2060
Centrifuge
MW 2-6
Large Bunker
Historical Operational Area K Test Bays & Misc. Facilities
2040
Prism
TT-MW2-17S 2024.16'
Parking Area
4 Test Bays
TT-MW2-17D 2023.95'
2020
TT-MW2-3 2024.01'
TT-MW2-39 2017.72'
TT-MW2-38A 2024.93'
2020
TT-MW2-33A 2009.33'
TT-MW2-14 2008.23'
2000
Small Bunker
Conditioning Chambers
MW 2-5
TT-MW2-13 1982.70'
1980
T-Revetment Conditioning Chambers
W 2-3
Disposal Area
Instrument Building
1960
TT-MW2-11 1954.67'
Reported Propellant Burn Site
TT-MW2-10 1943.79'
1940
MW 2-2
TT-MW2-28 1933.86'
1962 RWQCB Permitted Waste Discharge Area
Historical Operational Area M Garbage Disposal Area
W 2-1
MW 2-4
Historical Operational Area L Propellant Burn Area
Waste Discharge Area
1920
TT-MW2-26 1906.92'
TT-MW2-24 1910.52'
1900
TT-MW2-9S 1899.08'
TT-MW2-27 1898.12'
1880
TT-MW2-5 1871.66'
TT-MW2-6S 1872.37'
1860
1840
TT-PZ2-1 1827.91'
1820
TT-MW2-8 1819.42'
TT-EW2-1 1819.34'
TT-MW2-7 1819.03'
1800
TT-MW2-41A 1790.55'
1780
TT-MW2-42A 1772.82'
1760
1740
1720
TT-MW2-43 Dry
1700
1680
1660
TT-MW2-19S 1652.60'
See inset map for southern sample locations

1660
TT-MW2-19S 1652.60'
1640
1620
1600
1580
1560
TT-MW2-20S 1552.22'

LEGEND

- Monitoring Well Location with Groundwater Elevation (feet msl)
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Groundwater Elevation Contour
- Groundwater Flow Direction
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

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

20-foot groundwater interval.

Groundwater elevations in feet msl.

Beaumont Site 2

Figure 3-4

First Quarter 2010 Groundwater Contours for First Groundwater

TETRA TECH

Table 3-3 Summary of Horizontal and Vertical Groundwater Gradient

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

-	Overall	Overall
-	STF	QAL/WSTF
-	**TT-MW2-2**	**TT-MW2-16**
	to	to
	TT-MW2-6D	**TT-MW2-6S**
Fourth Quarter (December) 2009	0.029	0.030
FIrst Quarter (February) 2010	0.029	0.030

Vertical Groundwater Gradients (feet / foot)

-	**Area J**	**Area K**	**Area K**	**Area L**	**Southern portion of Site 2**	**Southern portion of Site 2**	**Southern portion of Site 2**	**Former Wolfskill Property**	**Former Wolfskill Property**
deep screen	**TT-MW2-2** (STF)	**TT-MW2-17D** (QAL/WSTF)	**TT-MW2-18** (STF)	**TT-MW2-4D** (STF)	**TT-MW2-9D** (STF)	**TT-MW2-6D** (STF)	**TT-MW2-7D** (STF)	**TT-MW2-19D** (MEF)	**TT-MW2-20D** (MEF)
shallow screen	**TT-MW2-16** (QAL/WSTF)	**TT-MW2-17S** (QAL/WSTF)	**TT-MW2-1** (QAL / WSTF)	**TT-MW2-4S** (STF)	**TT-MW2-9S** (QAL/WSTF)	**TT-MW2-6S** (QAL/WSTF)	**TT-MW2-7** (QAL/WSTF)	**TT-MW2-19S** (QAL/MEF)	**TT-MW2-20S** (QAL)
Fourth Quarter (December) 2009	-0.16	-0.02	0.01	-0.28	-0.13	-0.05	0.05	0.17	0.01
First Quarter (February) 2010	-0.16	-0.01	0.01	-0.27	-0.12	-0.06	0.05	0.19	0.03

Notes:

STF - San Timoteo Formation

MEF - Mt. Eden Formation

QAL - Quaternary Alluvium

QAL/WSTF - Quaternary Alluvium and weathered San Timoteo Formation

QAL/MEF - Quaternary Alluvium and Mt. Eden Formation

3.4 ANALYTICAL DATA SUMMARY

Groundwater samples collected during the Fourth Quarter 2009 monitoring event were analyzed for perchlorate. Select wells were also sampled for VOCs, NDMA, 1,4-dioxane, and natural attenuation parameters,. VOCs and perchlorate are contaminants of potential concern at the Site. During the First Quarter 2010 monitoring event, groundwater samples were analyzed for perchlorate, spring samples were analyzed for perchlorate and general minerals parameters, and storm water samples were tested for perchlorate and VOCs.

Summaries of validated laboratory analytical results for analytes detected above their respective MDLs during the Fourth Quarter 2009 monitoring event are presented in Table 3-4. Summaries of validated laboratory analytical results for analytes detected above their respective MDLs during the First Quarter 2010 monitoring event are presented in Tables 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 3-4 and 3-5. Tables 3-6 and 3-7 present summary statistics for validated organic and inorganic analytes detected during the monitoring events. Laboratory analytical data packages, which include all environmental, field QC, and laboratory QC results, are provided in Appendix G. A consolidated laboratory data summary table is presented in Appendix H.

3.4.1 Data Quality Review

The quality control samples were reviewed as described in the Revised Groundwater Sampling and Analysis Plan (Tetra Tech, 2003b). The data for the groundwater sampling activities were contained in analytical data packages generated by E.S. Babcock & Sons, Inc. These data packages were reviewed using the latest versions of the National Functional Guidelines for Organic and Inorganic Data Review documents from the EPA (EPA, 2008 and 2005).

Preservation criteria, holding times, field blanks, laboratory control samples (LCS), 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 A209B for total dissolved solids, Method AM23G for volatile fatty acids, Method AM20GAX for hydrogen, Method E300.0 for nitrate, sulfate, and chloride, Method E521 for low level NDMA, Method E332.0 for perchlorate, Method A5310 for total and dissolved organic carbon, Method RSK-175 for methane, ethane, ethene, Method SW8270C SIM for 1,4-dioxane, Method SW6010B for metals, and Method SW8260B for VOCs. Unless otherwise noted below, all data results met required criteria, are of known precision and accuracy, did not require qualification, and may be used as reported.

Method E521 for low level NDMA had surrogate recovery errors and field duplicate RPD errors that qualified as estimated in 33.4 percent of the total E521 data. The data qualified as estimated is usable for the intended purpose. Field blank contamination caused 13.3 percent of the total E521 data to be qualified for blank contamination. Data qualified for blank contamination is generally not usable. Additional sample volumes will be collected for future E521 analyses so the laboratory can perform corrective action to mitigate surrogate recovery errors.

Method SW8260B for VOCs had a surrogate recovery error that qualified as estimated in 0.05 percent of the total SW8260B data. Trip blank contamination caused 0.5 percent of the total SW8260B data to be qualified for blank contamination. The data qualified as estimated is usable for the intended purpose. Blank qualified data is generally not usable.

Method RSK-175 for methane, ethane, and ethene had holding time errors that qualified as estimated 7.7 percent of the total RSK-175 data. The data qualified as estimated is usable for the intended purpose. Method blank contamination caused 12.8 of the total RSK-175 data to be qualified for blank contamination. Additional sample volumes will be collected for future RSK-175 analyses so the laboratory can perform corrective action to mitigate method blank contamination.

Method E300.0 for anions had errors that qualified as estimated in the data listed below

- Two (66%) chloride samples were qualified for LCS recovery errors and two (66%) were qualified for matrix spike recovery errors.

- Five out of 16 nitrate samples (31.3%) had holding time errors. The holding time errors were due to instrument failure. The instrument has since been repaired.
- Two out of 16 sulfate samples (12.5%) were qualified for LCS recovery.

The E300 data qualified as estimated are usable for the intended purpose. Additional sample volumes will be collected for future E300 analyses so the laboratory can perform corrective action to mitigate laboratory LCS recovery errors.

Method AM23G for volatile fatty acids had field duplicate errors that qualified as estimated 1.7 percent of the total AM23G data. The data qualified as estimated is usable for the intended purpose. Method blank contamination qualified 14.5% of the total AM23G data. Data qualified for blank contamination is generally considered not usable. Additional sample volumes will be collected for future AMG23G analyses so the laboratory can perform corrective action to mitigate method blank contamination.

Method A5310 for dissolved organic carbon had field duplicate errors that qualified 7.7 percent of the total A5310 data. The estimated data is usable for the intended purpose.

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

Sample Location	Sample Date	Perchlorate	1,4-Dioxane	NDMA	Acetone	2-Butanone	Benzene	Carbon Disulfide	Chloroform	Chloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	c-1,2-Dichloroethene	t-1,2-Dichloroethene	Ethylbenzene	2-Hexanone	4-Methyl-2-Pentanone	Methylene Chloride	Toluene	1,1,2-Trichloroethane	Trichloroethene	Tetrachloroethene	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																									
WS-1	12/2/2009	<0.35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-2	12/2/2009	<0.35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
WS-3	12/2/2009	<0.35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-1	12/9/2009	**7,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-4S	12/4/2009	0.54	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-5	12/3/2009	**930**	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-6S	12/3/2009	**1,400**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-6D	12/3/2009	<0.71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-7	12/3/2009	**410**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-7D	12/3/2009	0.91	NA	NA	<5.0	<1.2	<0.14	2.1	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-8	12/3/2009	**350**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-9S	12/8/2009	**4,700**	**4.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-9D	12/4/2009	0.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-10	12/9/2009	<0.35	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-11	12/4/2009	**280**	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	0.39 Jq	<0.10	<0.26	<1.2	<0.95	0.20 Jq	<0.22	<0.31	**9.2**	<0.17	<0.36	<0.41
TT-MW2-12	12/14/2009	<0.71	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-13	12/14/2009	**2,700**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-14	12/14/2009	**47,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-17S	12/17/2009	**1,500**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-17D	12/10/2009	**53,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-18	12/14/2009	**14,000**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19S	12/11/2009	5.7	<0.10	0.0026	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19D	12/2/2009	<0.071	NA	0.0044	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20S	12/2/2009	<0.35	NA	0.0012 Jq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20D	12/2/2009	<0.35	NA	**0.0100**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-21	12/4/2009	2.1	<0.10	0.0039 Jb	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	4.9	<0.22	<0.31	2.8	<0.17	<0.36	<0.41
TT-MW2-22	12/4/2009	<0.071	**42**	NA	<5.0	<1.2	0.87	0.37 Jq	0.29 Jq	<0.36	3.1	**1.7**	**29**	1.4	0.35 Jq	<0.26	<1.2	<0.95	**9.3**	<0.22	<0.31	**460**	<0.17	<0.36	<0.41
TT-MW2-23	12/11/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-24	12/11/2009	**140,000**	**320**	0.0040 Jf	<5.0	<1.2	0.21 Jq	<0.36	3.8	<0.36	0.89	**0.78**	2.7	<0.18	<0.10	<0.26	<1.2	<0.95	0.78 BJkq	<0.22	0.60	**100**	<0.17	<0.36	<0.41
TT-MW2-25	12/4/2009	<0.071	NA	0.0031	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-26	12/4/2009	**90**	<0.10	0.0032	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-27	12/3/2009	**200**	NA	NA	<5.0	<1.2	<0.14	1.2	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-28	12/4/2009	**29**	NA	**0.0100**	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.15 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
Method Detection Limit		0.071	0.10	0.0007	5	1.2	0.14	0.36	0.17	0.36	0.098	0.21	0.12	0.18	0.10	0.26	1.2	0.95	0.15	0.22	0.31	0.17	0.17	0.36	0.41
MCL (unless noted) / DWNL		6	3 (1)	0.01 (1)	-	-	1	160 (1)	-	-	5	0.5	6	6	10	300	-	-	5	150	5	5	5	1750	1750

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
NDMA - N-Nitrosodimethylamine
MCL - California Department of Health Services Maximum Contaminant Level.
DWNL - California Department of Health Services drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
< # - Method detection limit concentration is shown.
Bold - Maximum Contaminant Level exceeded.

NA - Not analyzed
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
b - The surrogate spike recovery was outside control limits.
f - The duplicate Relative Percent Difference (RPD) was outside the control limit
k - The analyte was found in a field blank.
q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3 4 Summary of Validated Detected Organic and Inorganic Analytes - Fourth Quarter 2009 (continued)

Sample Location	Sample Date	Per chlorate	1,4-Dioxane	NDMA	Acetone	2-Butanone	Benzene	Carbon Disulfide	Chloro form	Chloro methane	1,1-Dichloro ethane	1,2-Dichloro ethane	1,1-Dichloro ethene	c-1,2-Dichloro ethene	t-1,2-Dichloro ethene	Ethyl benzene	2-Hexanone	4-Methyl-2-Pentanone	Methylene Chloride	Toluene	1,1,2-Trichloro ethane	Trichloro ethene	Tetrachloro ethene	m,p-Xylenes	o-Xylene
All results reported in µg/L unless otherwise stated																									
TT-MW2-29B	12/7/2009	0.25	NA	**0.0110**	<5.0	<1.2	<0.14	1.3	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-29C	12/7/2009	0.22	NA	NA	<5.0	<1.2	<0.14	0.96	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	0.26 Jq	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-30A	12/14/2009	**5,300**	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-30B	12/11/2009	**1,100**	NA	NA	<5.0	<1.2	<0.14	0.70	0.20 Jq	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-30C	12/11/2009	<0.071	NA	NA	15	24	<0.14	1.7	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.20 BJkq	1.8	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-31A	12/9/2009	<0.35	NA	NA	<5.0	<1.2	<0.14	1.0	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-31B	12/9/2009	<0.35	NA	NA	<5.0	<1.2	0.25 Jq	2.0	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	1.4	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-32	12/9/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	0.98	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-33A	12/11/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-33B	12/15/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	1.4	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.17 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-33C	12/15/2009	0.37	NA	NA	<5.0	<1.2	0.22 Jq	0.93	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	7.4	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-34A	12/15/2009	0.39	NA	NA	<5.0	<1.2	<0.14	2.1	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.19 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-34B	12/15/2009	0.43	NA	NA	<5.0	<1.2	<0.14	0.67	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.16 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-34C	12/15/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	1.4	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.16 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-35A	12/9/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	1.3	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	0.49 Jq	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-35B	12/9/2009	<0.071	NA	NA	<5.0	<1.2	0.24 Jq	0.93	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.15 BJkq	3.0	<0.31	<0.17	0.22 Jq	<0.36	<0.41
TT-MW2-36A	12/10/2009	<0.071	NA	0.0067 Jf	<5.0	<1.2	<0.14	0.71	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.23 BJkq	0.60	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-36B	12/10/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.22 BJkq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-36C	12/10/2009	<0.071	NA	NA	37	4.8	0.45 Jq	57	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.25 BJkq	1.0	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-37A	12/8/2009	**4100**	**7.5**	NA	100	16	0.52	<0.36	0.19 Jq	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	2.5 Jq	1.4 Jq	<0.15	0.53	<0.31	0.86	<0.17	<0.36	<0.41
TT-MW2-37B	12/8/2009	0.49	NA	NA	<5.0	<1.2	<0.14	13	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	0.66	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-38A	12/14/2009	**170,000**	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-38B	12/17/2009	**15,000**	NA	NA	<5.0	1.4 Jq	<0.14	10	<0.17	0.73	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-38C	12/14/2009	0.092 Jq	NA	NA	<5.0	<1.2	<0.14	0.59	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-39	12/15/2009	**81,000**	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.15 Jq	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-40A	12/10/2009	<0.071	NA	NA	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-40B	12/10/2009	4	NA	NA	<5.0	<1.2	**21**	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	1.6	<1.2	<0.95	0.21 BJkq	13	<0.31	<0.17	<0.17	2.4	1.6
TT-MW2-40C	12/10/2009	<0.071	NA	NA	<5.0	1.9 Jq	0.57	2.0	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	0.25 BJkq	0.51	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-41A	12/16/2009	<0.071	<0.10	0.0042 Bk	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-41B	12/16/2009	0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-42A	12/16/2009	<0.071	<0.10	0.0020 Bk	<5.0	<1.2	<0.14	<0.36	<0.17	<0.36	<0.098	<0.21	<0.12	<0.18	<0.10	<0.26	<1.2	<0.95	<0.15	<0.22	<0.31	<0.17	<0.17	<0.36	<0.41
TT-MW2-42B	12/16/2009	0.099 Jq	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit		0.071	0.10	0.0007	9.1	6.9	0.28	1.9	0.33	0.36	0.37	0.31	0.40	0.49	0.10	0.22	1.2	1.0	2.6	0.33	0.54	0.30	0.17	0.45	0.24
MCL (unless noted) / DWNL		6	3 (1)	0.01 (1)	-	-	1	160 (1)	-	-	5	0.5	6	6	10	300	-	-	5	150	5	5	5	1750	1750

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
NDMA - N-Nitrosodimethylamine
MCL - California Department of Health Services Maximum Contaminant Level.
DWNL - California Department of Health Services drinking water notification level.
(1) - DWNL
" - " MCL/DWNL not established.
< # - Method detection limit concentration is shown.
Bold - Maximum Contaminant Level exceeded.

NA - Not analyzed
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
b - The surrogate spike recovery was outside control limits.
f - The duplicate Relative Percent Difference (RPD) was outside the control limit
k - The analyte was found in a field blank.
q - The analyte detected was below the Practical Quantitation Limit (PQL).

Table 3-5 Summary of Validated Detected Organic and Inorganic Analytes - First Quarter 2010

Sample Name	Sample Date	Methylene Chloride - ug/L	Perchlorate - ug/L	Calcium - mg/L	Magnesium -mg/L	Potassium -mg/L	Sodium - mg/L	Alkalinity, Total (as CaCO3) - mg/L	Bicarbonate (as CaCO3) -mg/L	Total Dissolved Solids - mg/L	Chloride - mg/L	Sulfate - mg/L
WS-1	2/16/2010	NA	<0.071	38	6.9	4.8	100	100	120	410	45 Jcf	160
WS-2	2/16/2010	NA	<0.071	42	8.2	6.4	110	110	130	420	46 Jd	160
SW-02	2/6/2010	<0.15	**11**	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-03	2/6/2010	<0.15	0.59	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-05	2/6/2010	<0.15	0.66	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-06	2/6/2010	<0.15	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-07	1/27/2010	0.20 Jbq	0.91	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19S	2/16/2010	NA	5.4	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-19D	2/16/2010	NA	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20S	2/16/2010	NA	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-20D	2/16/2010	NA	<0.071	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-41A	2/17/2010	NA	0.18	NA	NA	NA	NA	NA	NA	NA	NA	NA
TT-MW2-42A	2/17/2010	NA	0.17	NA	NA	NA	NA	NA	NA	NA	NA	NA
Method Detection Limit		0.15	0.071	0.50	0.50	0.50	0.50	1.7	1.7	11	0.50	0.37
MCL (unless noted) / DWNL		5	6	-	-	-	-	-	-	500	250	250

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 Services 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.

b - the surrogate spike recovery was outside control limits.

c - The Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recoveries were outside control limits.

d - The Laboratory Control Sample (LCS) recovery was outside control limits.

f - The duplicate Relative Percent Difference (RPD) was outside the control limit

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

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

Compounds Detected	Total Number of Samples Analyzed (1)	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	Corresponding MCL (unless noted) / DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
Organic Analytes:									
1,4-Dioxane	10	5	4	3 (2)	µg/L	1.0	µg/L	320	µg/L
NDMA	13	11	3	0.01 (2)	µg/L	0.0012	µg/L	0.011	µg/L
Acetone	40	3	0	-	µg/L	15	µg/L	100	µg/L
2-Butanone	40	5	0	-	µg/L	1.4	µg/L	24	µg/L
Benzene	40	9	1	1	µg/L	0.21	µg/L	21	µg/L
Carbon Disulfide	40	23	0	160 (2)	µg/L	0.37	µg/L	57	µg/L
Chloroform	40	4	0	-	µg/L	0.19	µg/L	3.8	µg/L
Chloromethane	40	1	0	300	µg/L	0.73	µg/L	0.73	µg/L
1, 1-Dichloroethane	40	2	0	5	µg/L	0.89	µg/L	3.1	µg/L
1, 2-Dichloroethane	40	2	2	0.5	µg/L	0.78	µg/L	1.7	µg/L
1, 1-Dichloroethene	40	2	1	6	µg/L	2.7	µg/L	29	µg/L
cis-1, 2-Dichloroethene	40	2	0	6	µg/L	0.39	µg/L	1.4	µg/L
trans-1,2-Dichloroethene	40	1	0	10	µg/L	0.35	µg/L	0.35	µg/L
Ethylbenzene	40	1	0	300	µg/L	1.6	µg/L	1.6	µg/L
2-Hexanone	40	1	0	-	µg/L	2.5	µg/L	2.5	µg/L
4-Methyl-2-Pentanone	40	1	0	-	µg/L	1.4	µg/L	1.4	µg/L
Methylene Chloride	40	9	1	5	µg/L	0.15	µg/L	9.3	µg/L
Toluene	40	12	0	150	µg/L	0.26	µg/L	13	µg/L
1, 1, 2-Trichloroethane	40	1	0	5	µg/L	0.6	µg/L	0.6	µg/L
Trichloroethene	40	5	3	5	µg/L	0.86	µg/L	460	µg/L
Tetrachloroethene	40	1	0	5	µg/L	0.22	µg/L	0.22	µg/L
m,p-Xylenes	40	1	0	1750	µg/L	2.4	µg/L	2.4	µg/L
o-Xylene	40	1	0	1750	µg/L	1.6	µg/L	1.6	µg/L
Inorganic Analytes:									
Perchlorate	65	37	22	6	µg/L	0.092	µg/L	170,000	µg/L

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

(1) - Number of detections exclude sample duplicates, trip blanks, and equipment blanks.
(2) - California Department of Health Services state drinking water notification level.
MCL - California Department of Health Services Maximum Contaminant Level.
DWNL - California Department of Health Services state drinking water notification level.
" - " MCL/DWNL not established.
µg/L - Micrograms per liter.
NDMA - N-Nitrosodimethylamine

Table 3-7 Summary Statistics of Validated Detected Organic and Inorganic Analytes - First Quarter 2010

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:									
Methylene Chloride	5	1	0	5	µg/L	0.20	µg/L	0.20	µg/L
Inorganic Analytes:									
Perchlorate	13	8	1	6	µg/L	0.17	µg/L	11	µg/L
Total Alkalinity (as CaCO3)	2	2	0	-	mg/L	100	mg/L	110	mg/L
Bicarbonate (as CaCO3)	2	2	0	-	mg/L	120	mg/L	130	mg/L
Total Dissolved Solids	2	2	0	500	mg/L	410	mg/L	420	mg/L
Chloride	2	2	0	250	mg/L	46	mg/L	46	mg/L
Sulfate	2	2	0	250	mg/L	160.0	mg/L	160	mg/L
Calcium	2	2	0	-	mg/L	39.0	mg/L	42	mg/L
Magnesium	2	2	0	-	mg/L	7.1	mg/L	8	mg/L
Potassium	2	2	0	-	mg/L	4.9	mg/L	6	mg/L
Sodium	2	2	0	-	mg/L	100	mg/L	110	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) - California Department of Health Services state drinking water notification level.
MCL - California Department of Health Services 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 CHEMICALS OF POTENTIAL CONCERN

COPC evaluation and trend analysis are performed annually as part of the Second Quarter monitoring event. The analytes detected were screened against the MCLs or DWNLs (if an MCL is not established). The analytes were organized and evaluated in two groups, organic and inorganic analytes, and divided into primary and secondary COPCs. Table 3-8 presents a summary of the Site 2 COPCs. Laboratory analytical results from the Fourth Quarter 2009 and First Quarter 2010 monitoring events are presented in the following two subsections. Data which are B qualified because of association with either laboratory or field contamination is not included in the COPC evaluation. Figures 3-5 and 3-6 present summaries of COPC laboratory results for groundwater samples collected for the Fourth Quarter 2009 and First Quarter 2010.

Table 3-8 Groundwater Chemicals of Potential Concern

Analyte	Classification
Perchlorate	Primary
Trichloroethene	Primary
Methylene Chloride	Primary
1,4-Dioxane	Primary
RDX	Secondary
Notes:	
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine	

3.5.1 Organic Analytes

Seven organic analytes (1,4-dioxane, 1,2-DCA, 1,1-DCE, benzene, methylene chloride, NDMA, and TCE) were detected above a published MCL or DWNL during the Fourth Quarter 2009 and First Quarter 2010 monitoring events. Tables 3-4 and 3-5 presents summaries of validated organic analyte concentrations reported in groundwater samples collected during the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events.

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TT-MW2-36B
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.22 BJkq
NDMA -

TT-MW2-36A
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.23 BJkq
NDMA 0.0067 Jf

TT-MW2-29B
Perchlorate 0.25
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA **0.011**

TT-MW2-29C
Perchlorate 0.22
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-36C
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.25 BJkq
NDMA -

TT-MW2-38C
Perchlorate 0.092 Jq
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-40B
Perchlorate 4
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.21 BJkq
NDMA -

TT-MW2-40C
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.25 BJkq
NDMA -

TT-MW2-39
Perchlorate **81,000**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.15 Jq
NDMA -

TT-MW2-40A
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-33C
Perchlorate 0.37
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-33A
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-17D
Perchlorate **53,000**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-33B
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.17 Jq
NDMA -

TT-MW2-17S
Perchlorate **1,500**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-38A
Perchlorate **170,000**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-34C
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.16 Jq
NDMA -

TT-MW2-38B
Perchlorate **15,000**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-31B
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-13
Perchlorate **2,700**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-14
Perchlorate **47,000**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-31A
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-1
Perchlorate **7,700**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-18
Perchlorate **14,000**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-30A
Perchlorate **5,300**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-30B
Perchlorate **1,100**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-12
Perchlorate <0.71
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-34A
Perchlorate 0.39
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.19 Jq
NDMA -

TT-MW2-34B
Perchlorate 0.43
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.16 Jq
NDMA -

TT-MW2-32
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-30C
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.20 BJkq
NDMA -

TT-MW2-35B
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.15 BJkq
NDMA -

TT-MW2-11
Perchlorate **280**
1,4-Dioxane -
Trichloroethene **9.2**
Methylene Chloride 0.20 Jq
NDMA -

TT-MW2-4S
Perchlorate 0.54
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-35A
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-10
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-28
Perchlorate **29**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride 0.15 Jq
NDMA **0.01**

TT-MW2-26
Perchlorate **90**
1,4-Dioxane <0.10
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA 0.0032

TT-MW2-23
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-21
Perchlorate 2.1
1,4-Dioxane 0.10
Trichloroethene 2.8
Methylene Chloride 4.9
NDMA 0.0039 Jb

TT-MW2-37A
Perchlorate **4,100**
1,4-Dioxane **7.5**
Trichloroethene 0.86
Methylene Chloride <0.15
NDMA -

TT-MW2-9S
Perchlorate **4,700**
1,4-Dioxane **4.3**
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-22
Perchlorate <0.071
1,4-Dioxane **42**
Trichloroethene **460**
Methylene Chloride 9.3
NDMA -

TT-MW2-24
Perchlorate **140,000**
1,4-Dioxane **320**
Trichloroethene **100**
Methylene Chloride 0.78 BJkq
NDMA 0.0040 Jf

TT-MW2-6D
Perchlorate <0.71
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-9D
Perchlorate 0.22
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-6S
Perchlorate **1,400**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-37B
Perchlorate 0.49
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-25
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA 0.0031

TT-MW2-5
Perchlorate **930**
1,4-Dioxane 1
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-27
Perchlorate **200**
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-8
Perchlorate **350**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-7D
Perchlorate 0.91
1,4-Dioxane -
Trichloroethene <0.17
Methylene Chloride <0.15
NDMA -

TT-MW2-41B
Perchlorate 0.11
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-41A
Perchlorate <0.071
1,4-Dioxane <0.10
Trichloroethene <0.10
Methylene Chloride <0.15
NDMA 0.0042 Bk

TT-MW2-7
Perchlorate **410**
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-42A
Perchlorate <0.071
1,4-Dioxane <0.10
Trichloroethene <0.10
Methylene Chloride <0.15
NDMA 0.0020 Bk

TT-MW2-42B
Perchlorate 0.099 Jq
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

TT-MW2-19S
Perchlorate **5.7**
1,4-Dioxane <0.10
Trichloroethene -
Methylene Chloride -
NDMA 0.0026

TT-MW2-19D
Perchlorate <0.071
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA 0.0044

TT-MW2-20D
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA **0.01**

TT-MW2-20S
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA 0.0012 Jq

WS-1
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

WS-2
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

WS-3
Perchlorate <0.35
1,4-Dioxane -
Trichloroethene -
Methylene Chloride -
NDMA -

Historical Operational Area K
Test Bays & Misc. Facilities

Historical Operational Area J
Final Assembly

Historical Operational Area L
Propellant Burn Area

Historical Operational Area M
Garbage Disposal Area

Waste Discharge Area

1962 RWQCB Permitted Waste Discharge Area

Disposal Site

W 2-5
W 2-2
W 2-3
W 2-1
MW 2-6
MW 2-5
MW 2-2
MW 2-4
TT-MW2-2
TT-MW2-16
TT-MW2-29A
TT-MW2-3
SW-01
SW-02
SW-03
SW-04
SW-05
SW-06
SW-07
TT-PZ2-1
TT-PZ2-2
TT-MW2-10
TT-MW2-43

See inset map for southern sample locations

LEGEND

- Well
- Surface Water Sampling Location
- Spring
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Note: Bold indicates corresponding MCL of DWNL exceeded.

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

Gray symbols indicate sample not available.

MCL - Maximum Contaminant Level

DWNL - Drinking Water Notification Limit

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

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

Beaumont Site 2

Figure 3-5

COPC Sampling Results - Fourth Quarter 2009

TETRA TECH

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Parking Area
Transformer Pad
Building 250 Rocket Assembly Building
Historical Operational Area J Final Assembly
W 2-2
W 2-5
Water Tanks and Pump House
TT-MW2-2
TT-MW2-16
Concrete Mount
TT-MW2-29A/B/C
Centrifuge
MW 2-6
Large Bunker
Historical Operational Area K Test Bays & Misc. Facilities
TT-MW2-36A/B/C
SW-01
Prism
TT-MW2-3
TT-MW2-40A/B/C
Parking Area
4 Test Bays
TT-MW2-17S/D
TT-MW2-39
TT-MW2-33A/B/C
SW-02
Perchlorate 11
Methylene Chloride <0.15
Small Bunker
TT-MW2-14
TT-MW2-30A/B/C
TT-MW2-38A/B/C
TT-MW2-34A/B/C
Conditioning Chambers
MW 2-5
TT-MW2-13
TT-MW2-31A/B
TT-MW2-1
TT-MW2-18
W 2-3
T-Revetment Conditioning Chambers
Disposal Area
Instrument Building
TT-MW2-12
Reported Propellant Burn Site
TT-MW2-32
TT-MW2-11
TT-MW2-35A/B
TT-MW2-10
SW-04
TT-MW2-4S/D
Historical Operational Area M Garbage Disposal Area
MW 2-2
SW-03
Perchlorate 0.59
Methylene Chloride <0.15
TT-MW2-28
1962 RWQCB Permitted Waste Discharge Area
W 2-1
Historical Operational Area L Propellant Burn Area
MW 2-4
TT-MW2-21
Waste Discharge Area
TT-MW2-26
TT-MW2-23
TT-MW2-37A/B
TT-MW2-22
TT-MW2-24
SW-05
Perchlorate 0.66
Methylene Chloride <0.15
TT-MW2-25
TT-MW2-27
TT-MW2-9S/D
TT-MW2-5
TT-MW2-6S/D
TT-MW2-19D
Perchlorate <0.071
Methylene Chloride -
TT-MW2-19S
Perchlorate 5.4
Methylene Chloride -
SW-06
Perchlorate 1.1
Methylene Chloride <0.15
TT-PZ2-1
TT-MW2-7D
TT-MW2-7
TT-MW2-8
TT-PZ2-2
WS-3
WS-1
Perchlorate <0.071
Methylene Chloride -
WS-2
Perchlorate <0.071
Methylene Chloride -
TT-MW2-41B
TT-MW2-41A
Perchlorate 0.18
Methylene Chloride -
TT-MW2-42B
TT-MW2-42A
Perchlorate 0.17
Methylene Chloride -
TT-MW2-43
TT-MW2-20S
Perchlorate <0.071
Methylene Chloride -
TT-MW2-20D
Perchlorate <0.071
Methylene Chloride -
SW-07
Perchlorate 0.91
Methylene Chloride 0.2
See inset map for southern sample locations
TT-MW2-19D
Perchlorate <0.071
Methylene Chloride -
TT-MW2-19S
Perchlorate 5.4
Methylene Chloride -

LEGEND

- Well
- Surface Water Sampling Location
- Spring
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Note: Bold indicates corresponding MCL of DWNL exceeded.

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

Gray symbols indicate sample not available.

MCL - Maximum Contaminant Level

DWNL - Drinking Water Notification Limit

0 500 1,000 Feet

Adapted from: April 2007 aerial photograph.

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

Beaumont Site 2

Figure 3-6

COPC Sampling Results - First Quarter 2010

TETRA TECH

1,4-Dioxane was reported in groundwater samples collected from five monitoring wells: TT-MW2-5, TT-MW2-9S, TT-MW2-22, TT-MW2-24, and TT-MW2-37A, during the Fourth Quarter 2009 monitoring event at concentrations ranging from 1.0 µg/L to 320 µg/L. All wells are located within or just downgradient of the former WDA. The DWNL for 1,4-dioxane is 3 µg/L.

1,2-DCA was reported in groundwater samples collected from two monitoring wells, TT-MW2-22 and TT-MW2-24, located in the former WDA, during the Fourth Quarter 2009 monitoring event at concentrations of 1.7 µg/L and 0.78 µg/L respectively. The MCL for 1,2-DCA is 0.5 µg/L.

1,1-DCE was reported in groundwater samples collected from two monitoring wells, TT-MW2-22 and TT-MW2-24, located in the former WDA, during the Fourth Quarter 2009 monitoring event at concentrations of 29 µg/L and 2.7 µg/L respectively. The MCL for 1,1-DCE is 6 µg/L.

Benzene was reported in groundwater samples collected from nine monitoring wells, TT-MW2-22, TT-MW2-24, TT-MW2-31B, TT-MW2-33C, TT-MW2-35B, TT-MW2-36C, TT-MW2-37A, TT-MW2-40B, and TT-MW2-40C during the Fourth Quarter 2009 monitoring event, at concentrations ranging from 0.21 µg/L to 21 µg/L. The MCL for benzene is 1 µg/L.

During Fourth Quarter 2009, methylene chloride was reported in groundwater samples collected from nine monitoring wells, TT-MW2-11, TT-MW2-21, TT-MW2-22, TT-MW2-28, TT-MW2-33B, TT-MW-34A, TT-MW2-34B, TT-MW2-34C, and TT-MW2-39. With the exception of monitoring wells TT-MW2-21 and TT-MW2-22, all detections were at or near the method detection limit of 0.15 µg/L. Methylene chloride was detected in monitoring wells TT-MW2-21 and TT-MW2-22, at concentrations of 4.9 µg/L and 9.3 µg/L respectively. During First Quarter 2010, methylene chloride was detected in surface water sample SW-07 at a concentration of 0.20 µg/L. Methylene chloride has previously been reported in groundwater samples collected from monitoring well TT-MW2-22 at concentration up to 220 µg/L. The MCL for methylene chloride is 5 µg/L.

NDMA was reported in groundwater samples collected from 11 monitoring wells during the Fourth Quarter 2009 monitoring event at concentrations ranging from 0.0012 µg/L to 0.011 µg/L. The DWNL for NDMA is 0.01 µg/L.

TCE was reported in groundwater samples collected from four monitoring wells, TT-MW2-21, TT-MW2-22, TT-MW2-24, and TT-MW2-37A, located in the former WDA during the Fourth Quarter 2009 monitoring event at concentrations of 2.8 µg/L, 460 µg/L, 100 µg/L, and 0.86 µg/L respectively. TCE was also reported in monitoring well TT-MW2-11, located in Area M at concentrations of 9.2 µg/L. The MCL for TCE is 5 µg/L. 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 Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events were acetone, 2-butanone, carbon disulfide, chloromethane, chloroform, 1,1-DCA, cis-1,2-DCE, trans-1,2-DCE, ethylbenzene, 2-hexanone, 4-methyl-2-pentanone, toluene, 1,1,2-trichloroethane, tetrachloroethene (PCE), m,p-xylenes, and o-xylenes. None of these compounds exceeded their MCL or DWNL, and generally they are not detected consistently from monitoring event to event.

3.5.2 Organic COPCs

Based on the analysis above and the concentrations detected during previous groundwater monitoring events, TCE, methylene chloride, and 1,4-dioxane 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 COPC. NDMA will be further evaluated to determine whether the source is groundwater contamination or if it is being introduced as cross contamination from an outside source (i.e., dedicated sampling pumps). The remaining 16 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

One inorganic analyte, perchlorate, was detected in groundwater above a published MCL or DWNL. Tables 3-4 and 3-5 present a summary of validated inorganic analyte concentrations reported in groundwater samples collected during the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events.

Perchlorate was reported in groundwater samples collected from 37 of 65 locations sampled during the Fourth Quarter 2009 groundwater monitoring event and eight of 13 locations sampled during the First Quarter 2010 monitoring event, at concentrations up to 170,000 µg/L. The

California MCL for perchlorate is 6 µg/L. Time-series graphs of perchlorate are provided in Appendix I.

3.5.4 Inorganic COPCs

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

3.6 NEW MONITORING WELLS

Three groundwater monitoring wells, TT-MW-41A, TT-MW2-42A, and TT-MW2-43, three piezometers, TT-MW2-41B, TT-MW2-42B, and TT-PZ2-2, and one extraction well, TT-EW2-1, were installed between September 2009 and October 2009 as part of the Site 2 Additional Offsite Well Installation and Aquifer Testing study (Tetra Tech, 2010c). Following completion of the well construction and development activities, as part of the installation process groundwater samples were collected from the newly installed monitoring wells and analyzed for perchlorate, and select wells were analyzed for VOCs, 1,4-dioxane, NDMA, and natural attenuation parameters. A complete description of the monitoring well installation activities and results is presented in the Site 2 Additional Offsite Well Installation and Aquifer Testing Report (Tetra Tech, 2010c).

Table 3-9 presents a summary of validated organic and inorganic analyte concentrations reported in new well samples collected as part of the installation process and during the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events.

Table 3-9 Summary of Validated Detected COPCs in New Wells

Sample Location	Sample Date	Perchlorate	1,4-Dioxane	NDMA	Methylene Chloride	Trichloroethene
All results reported in µg/L unless otherwise stated						
TT-EW2-1	10/23/2009	2.6	0.2	<0.0007	<0.15	<0.17
TT-EW2-1	10/30/2009	5.4	NA	NA	NA	NA
TT-MW2-41A	10/21/2009	0.66	<0.10	0.0030	<0.15	<0.17
TT-MW2-41A	11/23/2009	0.36	<0.10	0.0030	<0.15	<0.17
TT-MW2-41A	12/16/2009	<0.071	<0.10	0.0042 Bk	<0.15	<0.17
TT-MW2-41A	2/17/2010	0.18	NA	NA	NA	NA
TT-MW2-41B	12/16/2009	0.11	NA	NA	NA	NA
TT-MW2-42A	10/22/2009	<0.071	<0.10	0.002 Je	0.62 Jq	<0.17
TT-MW2-42A	11/23/2009	<0.071	<0.10	<0.0007	<0.15	<0.17
TT-MW2-42A	12/16/2009	<0.071	<0.10	0.0020 Bk	<0.15	<0.17
TT-MW2-42A	2/17/2010	0.17	NA	NA	NA	NA
TT-MW2-42B	12/16/2009	0.099 Jq	NA	NA	NA	NA
Method Detection Limit		0.071	0.10	0.0007	0.15	0.17
MCL (unless noted) / DWNL		6	3 (1)	0.01 (1)	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
µg/L - Micrograms per liter
MCL - California Department of Health Services 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.
NA - Not analyzed
B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
e - A holding time violation occurred.
k - The analyte was found in the field blank.
q - The analyte deteced was below the Practical Quantitation Limit (PQL).

3.7 SURFACE WATER SAMPLING RESULTS

Surface water samples were collected for perchlorate at three locations, WS-1, WS-2 and WS-3, from a spring on the former Wolfskill property during the Fourth Quarter 2009 and for perchlorate and general minerals parameters at two locations, WS-1 and WS-2, during First Quarter 2010 (Figure 2-4). Perchlorate was not detected above the MCL in WS-1, WS-2, or WS-3 during Fourth Quarter 2009 or First Quarter 2010. The MCL for perchlorate is 6 µg/L.

Storm water samples were collected from five locations during storm events on 27 January and 6 February 2010. Storm water samples were tested for VOCs, and perchlorate. Methylene chloride was detected in one sample, SW-07, at a concentration of 0.20 µg/L. No other VOCs were detected. Perchlorate was detected in all five storm water samples at concentrations ranging from 0.59 µg/L to 11 µg/L. No other surface water samples were collected during this reporting period.

Table 3-10 presents a summary of validated organic and inorganic analyte concentrations reported in surface water and storm water samples collected during the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events.

Table 3-10 Summary of Validated COPCs in Surface Water

Sample Name	Sample Date	Methylene Chloride - ug/L	Perchlorate µg/L
All results reported in µg/L unless otherwise stated			
WS-1	12/2/2009	NA	<0.35
WS-1	2/16/2010	NA	<0.071
WS-2	12/2/2009	NA	<0.35
WS-2	2/16/2010	NA	<0.071
WS-3	12/2/2009	NA	<0.35
SW-02	2/6/2010	<0.15	11
SW-03	2/6/2010	<0.15	0.59
SW-05	2/6/2010	<0.15	0.66
SW-06	2/6/2010	<0.15	1.1
SW-07	1/27/2010	0.20 Jbq	0.91
Method Detection Limit		0.15	0.071
MCL (unless noted) / DWNL		5	6

Notes:
µg/L - Micrograms per liter
MCL - California Department of Health Services Maximum Contaminant Level.
DWNL - California Department of Health Services drinking water notification level.
< # - Method detection limit concentration is shown.

3.8 MONITORED NATURAL ATTENUATION SAMPLING

Eleven monitoring wells, six associated with the groundwater perchlorate plume originating from the former Test Bay Area (TT-MW2-36A, TT-MW2-17D, TT-MW2-14, TT-MW2-1, TT-MW2-12 and TT-MW2-10), and five associated with the groundwater perchlorate plume originating from the former WDA (TT-MW2-23, TT-MW2-24, TT-MW2-9S, TT-MW2-5, and TT-MW2-7) were sampled and analyzed for monitored natural attenuation parameters (MNA) during the Fourth Quarter 2009 monitoring event. Samples for laboratory analysis were analyzed for total organic carbon (TOC), dissolved organic carbon (DOC), total iron, sulfate, methane, hydrogen, and volatile fatty acids (VFAs). Due to the short laboratory holding times associated with ferrous iron and sulfide, ferrous iron and sulfide were analyzed in the field just prior to sampling using a field instrument. Additionally, DO and ORP were monitored with field instruments during purging and sampling. Figure 3-7 presents monitoring well locations sampled for MNA during the Fourth Quarter 2009 monitoring event. Table 3-11 presents a summary of detected analytes and field measurements.

Former Test Bay Area

The wells selected for natural attenuation parameter sampling in the Test Bay perchlorate plume form a longitudinal traverse extending from TT-MW2-36A, which lies upgradient of the perchlorate plume, to wells TT-MW2-10 and TT-MW2-12, which lie downgradient of the perchlorate plume. Aquifer conditions at the upgradient well (TT-MW2-36A) are anaerobic, based on the low DO (<1 mg/L) and ORP (<100 mV). The hydrogen concentration (2 nmol/L) is suggestive of anaerobic conditions, and is within the range of sulfate reduction, consistent with the relatively low sulfate concentration (22 mg/L) and relatively high sulfide concentration (0.34 mg/L). Methane concentrations are somewhat elevated (68 µg/L), and are also consistent with anaerobic conditions. Nitrate, which competes with perchlorate for organic carbon, was not detected. Upgradient aquifer conditions therefore appear to be generally conducive to perchlorate biodegradation.

Aquifer conditions within the perchlorate plume range from mildly anaerobic in TT-MW2-17D (DO =0.65 mg/L and ORP = 53 mV) to mildly aerobic in TT-MW2-14 (DO = 4.4 m/L and ORP = 81 mV) and TT-MW2-1 (DO = 4.5 mg/L and ORP = 103 mV). In contrast, hydrogen concentrations are relatively high (3.5 to 6.5 nmol/L), suggestive of sulfate-reducing to methanogenic conditions. The hydrogen data do not appear to be consistent with the DO and ORP measurements, the presence of sulfate concentrations greater than upgradient well TT-MW2-36A, very low sulfide concentrations, and very low methane concentrations. The hydrogen results may be an artifact caused by minor corrosion of the stainless steel well screens. Organic carbon concentrations are relatively low, and nitrate concentrations in all three wells are elevated, ranging from 7.2 to 15 mg/L. The apparent slightly anaerobic to aerobic aquifer conditions and elevated nitrate concentrations suggest that conditions are unfavorable for perchlorate biodegradation.

X:\GIS\Lockheed S2_Q409Q110\MNA_Sample.mxd

TT-MW2-36A
Large Bunker
Parking Area
Prism
4 Test Bays
TT-MW2-17D
TT-MW2-14
Small Bunker
Conditioning Chambers
T-Revetment Conditioning Chambers
TT-MW2-1
Instrument Building
Disposal Site
Reported Propellant Burn Site
TT-MW2-12
TT-MW2-10
Historical Operational Area M Garbage Disposal Area
1962 RWQCB Permitted Waste Discharge Area
Historical Operational Area L Propellant Burn Area
Waste Discharge Area
TT-MW2-23
TT-MW2-24
TT-MW2-9S
TT-MW2-5
TT-MW2-7
TT-MW2-41A
TT-MW2-42A

LEGEND

- Monitoring Well Location
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Beaumont Site 2 Property Boundary

Adapted from: April 2007 aerial photograph.

Faults from the, *Site 2 Lineament Study, Tetra Tech, 2009.*

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

0 300 600 Feet

N

Beaumont Site 2

Figure 3-7

MNA Sample Locations

TETRA TECH

Table 3-11 Summary of Validated Detected Natural Attenuation Analytes and Field Measurements – Fourth Quarter 2009

		Field Parameters				Analytes											
Sample Location	**Sample Date**	**DO - mg/L**	**ORP - mVs**	**Sulfide -mg/L**	**Ferrous Iron - mg/L**	**Perchlorate -ug/L**	**Acetic Acid -mg/L**	**Hexanoic Acid - mg/L**	**Lactic Acid and HIBA - mg/L**	**Propionic Acid - mg/L**	**Dissolved Organic Carbon - mg/L**	**Total Organic Carbon -mg/L**	**Hydrogen -nM**	**Methane - ug/L**	**Nitrate (as N) - mg/L**	**Sulfate -mg/L**	**Iron - mg/L**
TT-MW2-1	12/9/09	4.45	102.9	0.00	0.00	**7,700**	0.1 Ba	<0.007	0.27 Ba	0.035 Jq	0.98	0.86	6.5	0.06 BJaq	7.2	31 Jd	<0.012
TT-MW2-5	12/3/09	4.66	159.1	0.01	0.11	**930**	0.11	0.01 Jq	<0.042	<0.002	0.93	0.80	9.9	0.08 Jq	**10**	140	0.047
TT-MW2-7	12/3/09	0.37	196.0	0.00	0.04	**410**	0.085	<0.007	<0.042	0.064 BJaq	1.6	1.2	3.4	0.04 Jq	5.4	190	<0.012
TT-MW2-9S	12/8/09	1.11	92.8	0.00	0.06	**4,700**	0.061 BJaq	<0.007	0.19 Ba	<0.002	3.6	1.4	5	0.08 BJaeq	**11**	130	<0.012
TT-MW2-10	12/9/09	3.11	110.7	0.00	0.03	<0.35	0.06 BJaq	<0.007	0.16 Ba	0.034 Jq	3.1	1.0	11	0.08 BJaq	<0.11	61 Jd	0.16
TT-MW2-12	12/14/09	2.82	57.5	0.01	0.03	<0.71	0.073 Ba	0.3	0.15 Ba	<0.002	5.2	1.2	5.4	0.76	<0.11	50	0.14
TT-MW2-14	12/14/09	4.36	80.8	0.00	0.04	**47,000**	0.046 BJaq	<0.007	0.14 Ba	<0.002	2.5	1.9	3.5	0.17 Ba	15	180	0.11
TT-MW2-17D	12/10/09	0.65	52.7	0.02	0.00	**53,000**	0.042 BJaq	0.11	0.097 BJaq	<0.002	1.2	0.94	4.1	0.17 Ba	8.8 Je	55	<0.012
TT-MW2-23	12/11/09	0.68	91.9	0.07	0.05	<0.071	0.23	<0.007	<0.042	<0.002	0.52 Jq	0.17 Jq	1.4	19	<0.11	25	**1.2**
TT-MW2-24	12/11/09	0.80	109.6	0.00	0.02	**140,000**	0.16 BJaf	<0.007	<0.042	<0.002	7.5	7.2	0.91	0.2	**61 Je**	95	0.013 Jq
TT-MW2-36A	12/10/09	0.78	-124.9	0.34	0.00	<0.071	0.11	<0.007	0.26 Ba	<0.002	1.3 Jf	1.1	2	68	<0.11 UJe	22	0.027
TT-MW2-41A	11/23/2009	0.65	-35.3	0.41	0.33	0	0.052 BJkq	<0.007	0.23 Bk	<0.002	1.6	11	-	1.2	0.34	130	11.0
TT-MW2-42A	11/23/2009	0.93	-6.1	0.03	0.03	<0.071	0.11	<0.007	0.4	<0.002	0.74 Ba	8.2	-	3.6	<0.11	46	0.28
Method Detection Limit		-	-	-	-	0.071	0.07	0.07	0.10	0.07	0.021	0.021	0.6	0.00784	0.11	0.37	0.012
MCL/DWNL (µg/L)		-	-	-	-	6	-	-	-	-	-	-	-	-	10	250	0.3

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

mg/L - milligrams per liter
µg/L - micrograms per liter.
nM - nanomoles
mV - millivolts
MCL - Maximum Contaminant Level.
DWNL - California Department of Health Services state drinking water notification level.
"-" - Not available.
<# - Analyte not detected, method detection limit concentration is shown.
Bold - Maximum Contaminant Level exceeded.

B - The sample result was less than 5 times blank contamination. Cross contamination is suspected.
J - The analyte was positively identified, but the concentration is an estimated value.
U - The analyte was analyzed for , but was not detected above the method detection limit.
a - The analyte was found in the method blank.
d - The Laboratory Control Sample (LCS) recovery was outside control limits.
e - A holding time violation occurred.
f - The duplicate Relative Percent Differnce was outside the control limit.
q -The analyte detection was below the Practical Quantitation Limit (PQL).

Conditions in downgradient wells TT-MW2-12 and TT-MW2-10 are mildly aerobic based on DO concentrations (2.8 to 3.2 mg/L) and ORP values (58 to 111 mV). As noted for the wells within the plume, hydrogen concentrations (5.4 to 11 nmol/L) are suggestive of highly reducing conditions, which is not consistent with the relatively high sulfate, low sulfide, and low methane concentrations. As previously noted, the hydrogen concentrations may be an artifact caused by minor corrosion of the stainless steel well screens. Organic carbon concentrations are relatively low, but still higher than those observed in the plume wells, and nitrate was not detected in either well. The apparently aerobic aquifer conditions are unfavorable for perchlorate biodegradation.

Waste Discharge Area

The wells selected for natural attenuation parameter sampling in the WDA perchlorate plume form a longitudinal traverse extending from TT-MW2-23, which lies within the WDA upgradient of the perchlorate plume, to wells TT-MW2-42A, which lies downgradient of the perchlorate plume and to the south of the site. Aquifer conditions at upgradient well TT-MW2-23 are mildly anaerobic, as indicated by the low DO (0.7 mg/L) and ORP (92 mV). The hydrogen concentration (1.4 nmol/L) also suggests mildly anaerobic redox conditions, which are compatible with the slightly elevated dissolved iron (1.2 mg/L), relatively low sulfate concentration (25 mg/L), slightly elevated sulfide (0.07 mg/L), and slightly elevate methane (19 µg/L). Organic carbon concentrations are relatively low, and nitrate was not detected. Upgradient aquifer conditions appear to be generally conducive to perchlorate biodegradation.

Aquifer conditions within the plume range from mildly anaerobic in wells TT-MW2-24, TT-MW2-9S (DO 0.8 and 1.1 mg/L, ORP 110 to 93 mV, respectively) to mildly aerobic in TT-MW2-5 and TT-MW2-7 (DO 0.37 to 4.7, ORP 159 to 196 mV, respectively). The hydrogen concentration in TT-MW2-24 (which has a PVC well screen) is 0.91 nmol/L, consistent with the mildly anaerobic conditions suggested by the DO and ORP data. Hydrogen concentration in TT-MW2-9S, TT-MW2-5, and TT-MW2-7 range from 3.4 to 9.9 nmol/L, which are suggestive of highly reducing conditions and inconsistent with the DO and ORP data. As previously noted, the hydrogen concentrations may be an artifact caused by minor corrosion of the stainless steel well screens. Sulfate concentrations are high and sulfide concentrations are low, which supports mildly anaerobic to mildly aerobic aquifer conditions. Total organic carbon concentrations are relatively high (7.5 mg/L) in TT-MW2-24, and are lower (3.6 to 0.93 mg/L) in the downgradient wells.

Nitrate concentrations are elevated in all wells, ranging from 5.4 to 61 mg/L. Aquifer conditions within the plume do not appear to be conducive to perchlorate biodegradation.

Downgradient wells TT-MW2-41A and TT-MW2-42B are located in a riparian corridor south of the site property boundary. Both wells have low DO (0.65 to 0.9 mg/L) and low ORP (-6 to -35 mV), which are suggestive of anaerobic conditions. Dissolved iron and sulfide concentrations (11 and 0.41 mg/L, respectively) are elevated in TT-MW2-41A; methane is slightly elevated in both wells (1.2 µg/L in TT-MW2-41A, 3.6 µg/L in TT-MW2-42A). These observations are consistent with the presence of reducing conditions. Total organic carbon concentration are low, but dissolved organic carbon concentrations are relatively high (8.2 to 11 mg/L). Nitrate concentrations are low to non-detectable. Aquifer conditions in the downgradient area appear to be conducive to perchlorate biodegradation.

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 USFWS approved 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. As a result, no impact to SKR occurred during the performance of the field activities related to the Fourth Quarter 2009 and First Quarter 2010 monitoring events.

SECTION 4 SUMMARY AND CONCLUSIONS

This section summarizes the results of the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events. During the Fourth Quarter 2009 monitoring event 69 monitoring well locations and two piezometers were measured for groundwater levels and 62 monitoring wells and three surface water locations were sampled for groundwater quality. Two monitoring wells, TT-MW2-29A and TT-MW2-43, were found to be dry during the Fourth Quarter 2009 monitoring event. During the First Quarter 2010 monitoring event 69 monitoring well locations and two piezometers were measured for groundwater levels and six monitoring wells, two surface water locations, and five storm water locations were sampled for groundwater quality. Two monitoring wells, TT-MW2-29A and TT-MW2-43, were found to be dry during the First Quarter 2010 monitoring event.

4.1 GROUNDWATER ELEVATION AND FLOW

During the Fourth Quarter 2009 and First Quarter 2010 monitoring events, groundwater elevations at the Site ranges from about 2,075 feet msl in the northern portion of the Site, to about 1,819 feet msl in the southern portion of the Site. Depth to groundwater ranged from about 118 feet bgs to about 15 feet bgs.

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 screened wells appears to be southerly and generally follows the topography of Laborde Canyon. Groundwater flow will be refined as additional data are acquired.

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

4.1.1 Groundwater Gradients

Horizontal groundwater gradients across the Site are relatively constant. The horizontal groundwater gradients calculated between TT-MW2-16 and TT-MW2-6S from the Fourth Quarter

2009 and First Quarter 2010 groundwater monitoring events for the QAL/wSTF screened wells averaged 0.030 ft/ft. The horizontal groundwater gradients calculated between TT-MW2-2 and TT-MW2-6D for the Fourth Quarter 2009 and First Quarter 2010 groundwater monitoring events for the deeper STF screened wells averaged 0.029 ft/ft.

Generally the vertical gradients are downward on site and upward from the Site boundary south. The vertical gradients range from negative 0.28 to positive 0.19. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 3-3 and in Appendix E.

4.2 WATER QUALITY MONITORING

Groundwater samples collected during the Fourth Quarter 2009 and First Quarter 2010 monitoring events were analyzed for perchlorate. Select locations were analyzed for VOCs, natural attenuation parameters, general minerals, 1,4 dioxane, and NDMA. Based on the historical operations at the Site and groundwater monitoring results, perchlorate, TCE, methylene chloride, and 1,4-dioxane were identified as a primary COPCs. RDX was identified as a secondary COPC. NDMA will be further evaluated to determine whether the source is groundwater contamination or if it is being introduced as cross contamination from an outside source.

Perchlorate has not been detected in the groundwater above the MCL (6.0 µg/L) in Area J. In Area K, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 170,000 µg/L during Fourth Quarter 2009 and First Quarter 2010. Previously, perchlorate was detected as high as 190,000 µg/L. A source of perchlorate was identified in Area K. In Area L, downgradient of both Areas J and K, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 0.54 µg/L during Fourth Quarter 2009 and First Quarter 2010. Previously, perchlorate was detected as high as 2.1 µg/L. There are currently no indications that a source of perchlorate is present in Area L; the perchlorate detected in Area L groundwater appears to have originated in Area K. In Area M, the Garbage Disposal area, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 280 µg/L during Fourth Quarter 2009 and First Quarter 2010. Previously, perchlorate was detected as high as 469 µg/L. Area M has been identified as a source of perchlorate in groundwater. In the former WDA, downgradient of the operational areas J, K, L, and M, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 140,000 µg/L during Fourth Quarter 2009 and First Quarter 2010. Previously, perchlorate was detected as high as

190,000 µg/L. The former WDA has been identified as a source of perchlorate in groundwater. In the lower section of Laborde Canyon, downgradient of the operational areas and the former WDA, perchlorate in the groundwater was detected at concentrations ranging from below the MDL to 4,700 µg/L during Fourth Quarter 2009 and First Quarter 2010. Previously, perchlorate was detected as high as 4,100 µg/L in the lower section of Laborde Canyon and as high as 519 µg/L at the southern site boundary. No source of perchlorate has been identified at the southern site boundary. On the former Wolfskill property, south of the southern site boundary, perchlorate was detected in TT-MW1-19S during Fourth Quarter 2009 and First Quarter 2010 at concentrations of 5.7 µg/L and 5.4 µg/L respectively.

TCE was reported in groundwater samples collected from monitoring well TT-MW2-11 located in Area M at a concentration of 9.2 µg/L during the Fourth Quarter 2009. In the former WDA, TCE was detected in monitoring wells TT-MW2-21, TT-MW2-22, TT-MW2-24, and TT-MW2-37A at concentrations of 2.8 µg/L, 460 µg/L, 100 µg/L, and 0.86 µg/L, respectively during the Fourth Quarter 2009. The TCE MCL is 5 µg/L. Based on the data available at this time, the extent of the TCE plumes in groundwater appear to be isolated to small areas, and it does not extend offsite.

Methylene chloride was reported in groundwater samples collected from monitoring wells TT-MW2-21 and TT-MW2-22 located in the former WDA at concentrations of 4.9 µg/L and 9.2 µg/L respectively during the Fourth Quarter 2009. Additionally, methylene chloride was detected at or near the method detection limit of 0.15 µg/L during Fourth Quarter 2009 in monitoring wells TT-MW2-11, TT-MW2-28, TT-MW2-33B, TT-MW2-34A, TT-MW2-34B, TT-MW2-34C, and TT-MW2-30 and in storm water sample SW-07 during First Quarter 2010. The methylene chloride MCL is 5 µg/L. Based on the data available at this time, the extent of the methylene chloride plumes in groundwater appear to be isolated, and do not extend offsite.

1,4-dioxane was reported in groundwater samples collected from monitoring wells TT-MW2-5, TT-MW2-9S, TT-MW2-22, TT-MW2-24, TT-MW2-37A, which are located in or downgradient of the former WDA, at concentrations ranging from 1.0 µg/L to 320 µg/L during Fourth Quarter 2009. The 1,4-dioxane DWNL is 3 µg/L.

RDX samples are collected and analyzed only during the Second Quarter monitoring event so no samples were collected during this monitoring period. RDX was initially analyzed for as part of a

screening evaluation for emerging contaminants. The origin of the RDX is unknown. Based on the data available at this time, the extent of the RDX plume in groundwater appears to be isolated to Area K and the former WDA and does not extend offsite.

NDMA was detected in groundwater samples collected from 11 monitoring wells during the Fourth Quarter 2009 monitoring event at concentrations ranging from 0.0012 µg/L to 0.011 µg/L. The DWNL for NDMA is 0.01 µg/L The origin of the NDMA is unknown. However, based on the data available at this time, the source of the NDMA contamination may be the site approved dedicated purging and sampling pumps.

Natural Attenuation Sampling

The objective of the MNA sampling and analyses effort is to understand the geochemical characteristics upgradient, within and downgradient from the Test Bay Area and WDA perchlorate plumes. A preliminary evaluation of MNA suggests that there is limited potential for natural perchlorate biodegradation, except within the riparian area downgradient of the WDA perchlorate plume.

4.3 GROUNDWATER MONITORING PROGRAM AND THE GROUNDWATER QUALITY MONITORING NETWORK

Twenty-two 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, methylene chloride, and 1,4-dioxane have been identified as primary COPCs. All monitored wells will be tested for perchlorate semi-annually, and select wells will be sampled for VOCs and 1,4-dioxane semi-annually or annually. Because of the previous detections of RDX in TT-MW2-1 and TT-MW2-13, and the recent detection of RDX in TT-MW2-24, sampling for RDX will continue to be conducted annually in monitoring wells TT-MW2-1, TT-MW2-13, and TT-MW2-24.

Due to the uncertainty of the source of the contamination, select wells will continue to be sampled for NDMA semi-annually until the source of the contamination can be determined.

Because of previous detections of arsenic above the MCL, unfiltered metals will be analyzed for all monitored wells sampled annually during the Second Quarter sampling event until background levels for metals can be determined. Filtered metals will be collected for ecological risk assessment in water table monitoring wells where the water level is less than 25 feet below ground surface, and where the well screen is less 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 evaluated annually during the Second Quarter of each year and modified to accommodate expanded Site knowledge or changing Site conditions.

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