Semiannual Groundwater Monitoring Report
Second Quarter 2016 and Third Quarter 2016
Laborde Canyon (Lockheed Martin Beaumont Site 2)
Beaumont, California

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LOCKHEED MARTIN

December 29, 2016

Mr. Daniel K. Zogaib
California Environmental Protection Agency
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, California 90630

Subject: Submittal of the *Semiannual Groundwater Monitoring Report, Second Quarter 2016 and Third Quarter 2016, Lockheed Martin Corporation, Laborde Canyon (Lockheed Martin Beaumont Site 2), Beaumont California*

Dear Mr. Zogaib:

Please find enclosed one hardcopy of the body of the report and two compact discs with the report body and appendices of *the Semiannual Groundwater Monitoring Report, Second Quarter 2016 and Third Quarter 2016, Lockheed Martin Corporation, Laborde Canyon (Lockheed Martin Beaumont Site 2), Beaumont California* for your review and approval or comment.

If you have any questions regarding this submittal, please contact me at 443-280-7176 or jeff.s.thomas@lmco.com .

Sincerely,

Jeffrey Thomas
Beaumont 2 Project Lead
Lockheed Martin Corporation

Enclosure: *Semiannual Groundwater Monitoring Report, Second Quarter 2016 and Third Quarter 2016, Lockheed Martin Corporation, Laborde Canyon (Lockheed Martin Beaumont Site 2), Beaumont California*

cc: Mr. Brian Thorne, Lockheed Martin Corporation (electronic copy)
Ms. Barbara Melcher, CDM Smith (electronic copy)

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Second Quarter 2016 and Third Quarter 2016
Laborde Canyon
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Prepared for:

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Prepared by:

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December 2016

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ACRONYMS AND ABBREVIATIONS

%/yr	percent change per year with respect to the sample mean
bgs	below ground surface
BTOC	below top of well casing
cis-1,2-DCE	*cis*-1,2-dichloroethene
COV	coefficient of variation
1,2-DCA	1,2-dichloroethane
1,1 -DCE	1,1-dichloroethene
DO	dissolved oxygen
DWNL	State Water Resources Control Board Division of Drinking Water drinking water notification level
EC	electrical conductivity
ft/ft	feet per foot
GMP	Groundwater Monitoring Program
HCP	Habitat Conservation Plan
J	This data validation qualifier means the analyte was positively identified, but the concentration is an estimated value.
LC	lower canyon
MAROS	Monitoring and Remediation Optimization System
MW	monitoring well
MCL	State Water Resources Control Board Division of Drinking Water maximum contaminant level
MEF	Mt. Eden formation
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
msl	mean sea level
µg/L	micrograms per liter
µg/L/yr	micrograms per liter per year
NA	not applicable/not available/not analyzed

ND	non-detect
NTUs	nephelometric turbidity units
NWS	National Weather Service
ORP	oxidation-reduction potential
PQL	practical quantitation limit
q	This data validation qualifier means the analyte detected was below the PQL.
QAL	Quaternary alluvium
QA/QC	quality assurance/quality control
RCA	Western Riverside County Regional Conservation Authority
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RPD	relative percent difference
RWQCB	Regional Water Quality Control Board, Santa Ana Region
S	Mann-Kendall statistic
STF	San Timoteo formation
TCE	trichloroethene
TOC	top of well casing
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
WDA	waste discharge area
wMEF	weathered Mt. Eden formation
wSTF	weathered San Timoteo formation

Section 1
Introduction

On behalf of Lockheed Martin Corporation (Lockheed Martin), Tetra Tech has prepared this Semiannual Groundwater Monitoring Report, which presents the results of the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring activities for the Laborde Canyon (former Lockheed Propulsion Company Beaumont Site 2) Groundwater Monitoring Program. Laborde Canyon is southwest of the City of Beaumont, Riverside County, California (Figure 1). Currently, the site is inactive except for ongoing investigative activities performed under Consent Order HSA 88/89-034, amended January 1, 1991, with the California Department of Toxic Substances Control.

The objectives of this report are to accomplish the following:

- Briefly summarize the site history
- Document the water quality monitoring procedures and results
- Analyze and evaluate the groundwater elevation and water quality monitoring data generated
- Identify groundwater chemicals of potential concern based on the analytes detected at the site.
- Propose changes to the monitoring network and sampling frequencies as necessary to meet the objectives of the overall program

This report is organized into the following sections: (1) Introduction, (2) Summary of Monitoring Activities, (3) Groundwater Monitoring Results, (4) Summary and Conclusions, and (5) References.

1.1 SITE BACKGROUND

The site consists of 2,668 acres of land located southwest of Beaumont, California. The parcels that comprise the site were owned by individuals and the United States government before 1958. Between 1958 and 1960, portions of the site were purchased by the Grand Central Rocket

Company and used as a remote test facility for early space and defense program efforts. In 1960, the Lockheed Aircraft Corporation purchased one-half interest in the Grand Central Rocket Company. The Grand Central Rocket Company became a wholly-owned subsidiary of the Lockheed Aircraft Corporation in 1961. The remaining parcels of land that comprise the site were purchased from the United States government between 1961 and 1964. In 1963, the Lockheed Propulsion Company became an operating division of the Lockheed Aircraft Corporation which was responsible for the operation of the site until its closure in 1974. The site was used by the Grand Central Rocket Company and the Lockheed Propulsion Company 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 during the 1970s (Radian Corporation, 1986). In 2007 the property was sold to the County of Riverside, California, which remains the current owner.

In 1989, the California Department of Health Services issued a Consent Order requiring Lockheed Martin to clean up contamination at the site related to past testing activities (California Department of Health Services, 1989). After reviewing reports on investigative and cleanup activities performed at the site, the California Department of Toxic Substances Control, as a successor agency, issued a no further remedial action letter to Lockheed Martin in 1993.

Because of 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, perchlorate, and 1,4-dioxane to determine the potential presence and concentration of those chemicals in groundwater. The analytical results indicated that volatile organic compounds and 1,4-dioxane were not present at or above their respective method detection limits. However, perchlorate was reported at a concentration of 4,080 micrograms per liter, which exceeded the then-current California Department of Public Health drinking water notification level of 4 micrograms per liter. (In October 2007, the drinking water notification level was replaced by the California Department of Public Health maximum contaminant level of 6 micrograms per liter.) Based on the detection of perchlorate in the groundwater sample collected, the California Department of Toxic Substances Control reopened the site for further assessment in August 2004.

Four primary historical operational areas have been identified at the site (Figure 2). Each operational area was used for various activities associated with rocket motor assembly, testing, and propellant incineration. In addition, a waste discharge area has been defined. A brief description of each area follows.

Historical Operational Area J (Area J) –Final Assembly

Area J was used from 1970 to 1974 for final assembly and shipment of rocket motors for the Short Range Attack Missile program. Rocket motor casings with solid propellant were transported to Building 250, where final assembly of the rocket motor hardware was conducted. 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 Corporation, 1986).

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

The primary features in Area K included four test bays with two associated bunkers, conditioning chambers, a centrifuge, and a large earthen structure known as the "Prism."

Four test bays were present at the site. Initially, only three test bays were known; however, a former employee reported in an interview that a fourth test bay, north of the other three bays, was also used in Area K (Tetra Tech, 2009b). The initial testing activities had a history of explosions that destroyed complete test areas, especially during the period when the Grand Central Rocket Company operated at the site (Radian Corporation, 1986). Although vestiges from three test bays are currently visible at the site, the fourth was reportedly destroyed by such an explosion during testing. After a motor failure occurred, the area surrounding the test bay was reportedly inspected to recover any unburned propellant.

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

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

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

Solid propellant was reportedly transported to a burn area in Area L and set directly on the ground surface for burning (Radian Corporation, 1986). No pits or trenches were dug as part of the burning process according to the Radian report. No evidence or physical features identify the precise location of burning activities, and previous site investigations (Tetra Tech, 2005 and 2010a) found no evidence of significant contamination in Area L, suggesting that propellant incineration may not have been conducted in this area of the site.

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

The Area M garbage disposal area was located adjacent to a small creek at the site (Radian Corporation, 1986). Scrap metal, paper, wood, and concrete materials were discarded at the disposal site by the Lockheed Propulsion Company. Hazardous materials, including explosives and propellants, were not disposed of at the disposal site by the Lockheed Propulsion Company, according to employee interviews. However, Ogden Labs, a company that tested valves and explosive items, reportedly used this site for disposal of hazardous waste. In 1972, a Lockheed Safety Technician was exposed to toxic vapors of unsymmetrical dimethyl hydrazine from a pressurized gas container located in the disposal site. To avoid possible exposure risks to occupants, the Lockheed Propulsion Company safety group required Ogden Labs to remove any potentially hazardous materials at the disposal site. Shortly thereafter, Ogden Labs contracted for a disposal company to clean up the disposal site (Radian Corporation, 1986).

In March 1993, an excavation was performed to remove the debris from the Area M garbage disposal area. A total of 816 tons of debris was removed and disposed of off-site, and the excavation was backfilled to surrounding grade. Excavation activities were performed under the supervision of the Department of Toxic Substances Control (Radian Corporation, 1993).

Waste Discharge Area

In 2007, Lockheed Martin discovered the existence of Santa Ana River Basin Regional Water Pollution Control Board Resolution 62-24, dated September 14, 1962. Resolution 62-24 described 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 quarter of the NW quarter of Section 19, Township 3 South, Range 1 West, San Bernardino Baseline and Meridian. Resolution 62-24 further described the wastes to be discharged as “residue remaining after the manufacturing refuse is burned,” and indicated that the 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 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 as a large cleared area with roads leading to two circular structures, suggesting that the waste discharge area was in use by 1961 (Tetra Tech, 2009b). Investigation of this area found evidence for perchlorate impacts in both soil and groundwater (Tetra Tech, 2007b and 2008).

Features remaining at the waste discharge area 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 Second Quarter 2016 and Third Quarter 2016 groundwater monitoring activities conducted at the site. The results of these monitoring events are discussed in Section 3.

2.1 GROUNDWATER LEVEL MEASUREMENTS

Groundwater level measurements are collected at the site on a quarterly basis from all available wells. Water level measurements were proposed for 71 wells and four piezometers for Second Quarter 2016 and Third Quarter 2016. During Second Quarter 2016, groundwater level measurements were collected from 69 monitoring wells and four piezometers on 10 May and 11 May 2016. Two monitoring wells, TT-MW2-29A and TT-MW2-43, were found to be dry. During Third Quarter 2016, groundwater level measurements were collected from 69 monitoring wells and four piezometers on 22 August 2016. The same two monitoring wells were found to be dry. The groundwater level data are summarized in Table 1. Copies of the field data sheets from the water quality monitoring events are presented in Appendix A. A summary of well construction details is presented in Appendix B.

Precipitation data are collected from the local weather station in Beaumont to correlate observed changes in groundwater levels with local precipitation. During Second Quarter 2016, the Beaumont National Weather Service (NWS) station reported approximately 1.89 inches of precipitation. During Third Quarter 2016, the Beaumont NWS station reported approximately 0.16 inches of precipitation.

2.2 SURFACE WATER SAMPLING

Surface water samples are collected at the site during the second and fourth quarter groundwater monitoring events. Surface water sampling locations WS-1, WS-2, and WS-3 are located at a spring approximately 3,700 feet south of the southern site boundary on the Western Riverside County Regional Conservation Authority (RCA) property. Surface water is generally present at one or more of these sampling locations throughout the year. Figure 3 shows the surface water sampling locations.

Storm water samples are collected at the site on an annual basis, usually during the first quarter. Storm-water sampling locations SW-01 through SW-07 are in ephemeral stream beds within Laborde Canyon and major side canyons. Storm water runoff drains to the stream beds during periods of heavy precipitation and flows south through the site and the RCA property, eventually crossing beneath Gilman Hot Springs Road. Water is present in the stream beds only during periods of heavy, prolonged precipitation. Surface water flow measurements are collected at locations SF1 and SF2 when surface water is present in the stream bed. Figure 3 shows the storm-water sampling and stream-flow measurement locations.

During the Second Quarter 2016 monitoring event, three surface water sampling locations (WS-1 through WS-3) were proposed for water quality monitoring but were found to be dry and were not sampled. Table 2 lists the locations monitored for the Second Quarter 2016 monitoring event; Figure 4 illustrates the sampling locations. During the Third Quarter 2016 monitoring event, no surface water samples were scheduled to be collected.

2.3 GROUNDWATER SAMPLING

The Groundwater Monitoring Program (GMP) has a quarterly, semiannual, annual, and biennial frequency. Both groundwater and surface water are sampled as part of the GMP. The annual event is the major monitoring event, and the quarterly and semiannual events are smaller, minor events. All new wells are sampled quarterly for one year, after which a frequency for future sampling is proposed based on the well classification (i.e., the purpose of the well). The well classifications from the approved *Groundwater Sampling and Analysis Plan* (Tetra Tech, 2007a) include the following:

- Horizontal Extent Wells: Horizontal extent wells are utilized to assess the lateral extent of affected groundwater and the shape of the plume. Horizontal extent wells can be utilized to track plume migration and plume reduction rates as a result of remedial actions.
- Vertical Distribution Wells: Vertical distribution wells are utilized to assess the vertical extent of affected groundwater. Vertical distribution wells can also be utilized to track plume migration and plume reduction rates as a result of remedial actions.

- Increasing Contaminant Trend Wells: Increasing contaminant trend wells are wells that demonstrate statistically increasing contaminant trends. Increasing contaminant trend wells are utilized to assist in identifying new contaminant sources or areas where the remedial actions are not effective.

- Guard Wells: Guard wells would be utilized to provide an early warning to detect contaminants for the protection of private and municipal wells. Guard wells may also include wells used to monitor off-site contaminant migration.

- Background Wells: Background (or upgradient) wells are utilized to assess the quality of the groundwater that is entering the site.

- Remedial Monitoring Wells: Remedial monitoring wells are utilized to evaluate the effectiveness of remedial activities at the site. Remedial monitoring wells can be used to measure mass removal rates and assess remediation schedules for site cleanup.

- New Wells: New wells are wells that are new to the network or which have been out of the sampling program for an extended period of time.

- Redundant Wells: Redundant wells are wells that provide information that duplicates the data from other functional well classifications. Redundant wells are generally located in the same vicinity as one of the other well classifications. These wells provide no additional technical information and would not be monitored.

The annual monitoring event is performed during the second quarter of each year, and includes sampling of horizontal extent wells, vertical distribution wells, increasing contaminant trend wells, and guard wells. Background wells are also sampled during the annual monitoring event in even-numbered years. The semiannual event is performed during the fourth quarter of each year, and includes sampling of increasing contaminant trend and guard wells only. Quarterly events currently consist of water level measurements only. A complete list of the surface water and monitoring well locations in the monitoring program can be found in Table 3. The table shows the well classification and the current approved sampling frequency for each well.

The groundwater monitoring schedule is reviewed and modified as necessary annually following the second quarter groundwater monitoring event. Modifications to the sampling schedule are made in accordance with the approved *Groundwater Sampling and Analysis Plan* (Tetra Tech, 2007a). The Second and Third Quarter 2016 sampling events followed the monitoring schedule proposed in the Second and Third Quarter 2015 monitoring report (Tetra Tech, 2015), which was submitted to the California Department of Toxic Substances Control in December 2015, and was approved with no comments to the proposed schedule in March 2016 (Appendix C).

2.3.1 Proposed and Actual Well Locations Sampled

During the Second Quarter 2016 monitoring event, 51 groundwater monitoring wells were proposed for water quality monitoring. Two monitoring wells, TT-MW2-5 and TT-MW2-29A, were either dry or had insufficient water for sampling and could not be sampled. Therefore, water quality data were collected from 49 monitoring wells. Table 2 lists the locations monitored for the Second Quarter 2016 monitoring event, analytical methods, sampling dates, and QA/QC samples collected. Figure 4 illustrates the sampling locations for the Second Quarter 2016 monitoring event. During the Third Quarter 2016 monitoring event, no groundwater monitoring wells or off-site private production wells or springs were scheduled to be sampled.

2.3.2 Groundwater Sampling Procedures

Groundwater sampling was performed by low-flow purging and sampling methods, using either dedicated double-valve sampling pumps or a non-dedicated bladder pump, as indicated in Table 2. Water quality field parameters (water level, temperature, pH, electrical conductivity [EC], turbidity, oxidation-reduction potential [ORP], and dissolved oxygen [DO]) were measured during well purging and recorded on field data sheets (Appendix A). Collection of water quality parameters started 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. 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 were as follows: water level ± 0.1 foot, pH ± 0.1, EC ± three percent, turbidity < 10 nephelometric turbidity units (NTUs) (if > 10 NTUs ± 10%), DO ± 0.3 milligrams per liter (mg/L), and ORP ± 10 millivolts. Sampling instruments and equipment were maintained, calibrated, and operated in accordance with the manufacturers' specifications, guidelines, and recommendations. If a well was purged dry but recharge occurred, the well was sampled with a disposable bailer after sufficient recharge had taken place to allow sample collection.

Groundwater samples were collected in order of decreasing volatilization potential and placed in appropriate containers. A sample identification label was affixed to each container, and sample custody was maintained by chain-of-custody record. To maintain proper temperatures and sample integrity, samples collected were chilled and transported via courier to American Environmental Testing Laboratories, Inc. or EMAX Laboratories, Inc., state-accredited analytical laboratories. Trip blanks were collected for the monitoring events to assess potential cross-contamination of water samples while in transit to the laboratory in accordance with the *Revised Programmatic Sampling and Analysis Plan* (Tetra Tech, 2016). Equipment blanks were collected when sampling with non-dedicated equipment to assess potential cross-contamination of water samples via sampling equipment.

2.4 ANALYTICAL DATA QUALITY ASSURANCE/QUALITY CONTROL

The samples were tested using approved United States Environmental Protection Agency (USEPA) methods. Since the analytical data were obtained by following USEPA-approved method criteria, the data were evaluated by using the USEPA-approved validation methods described in the *National Functional Guidelines* (USEPA, 2014a and 2014b). These guidelines contain instructions on method-required quality control parameters and on how to interpret these parameters to confer validation to environmental data results.

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 United States Fish and Wildlife Service (USFWS) approved Habitat Conservation Plan (HCP) (USFWS, 2005) and subsequent clarifications (Lockheed Martin, 2006a and 2006b) to the HCP. Groundwater sampling activities were conducted with light duty vehicles and were supervised by a USFWS-approved biologist, as specified in the Low Effect HCP.

Section 3
Groundwater Monitoring Results

The results of Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events are presented in the following subsections. These subsections describe tabulated summaries of the groundwater elevation and water quality data, groundwater elevation maps, and figures showing analytical results.

3.1 GROUNDWATER ELEVATION AND FLOW

Seventy-one monitoring wells and four piezometers were identified for groundwater level measurements during the Second Quarter 2016 and Third Quarter 2016 monitoring events. During these events, two wells were dry (TT-MW2-29A, and TT-MW2-43) during both Second Quarter 2016 and Third Quarter 2016 events. A tabulated summary of groundwater depths and elevations is presented in Table 1.

On-site groundwater elevations during the Second Quarter 2016 and Third Quarter 2016 monitoring events ranged from approximately 2,072 feet above mean sea level (msl) at TT-MW2-16, located in the northern portion of the site, to about 1,815 feet above msl at TT-MW2-8, located in the southern portion of the site. Depth to first groundwater ranged from about 121 feet below ground surface (bgs) at TT-MW2-29B to about 21 feet bgs at TT-MW2-8. Groundwater elevation contour maps for wells screened in first groundwater for the Second Quarter 2016 and Third Quarter 2016 are presented in Figures 5 and 6, respectively. Hydrographs for individual wells are provided in Appendix D.

During Second Quarter 2016, the Beaumont National Weather Service (NWS) reported approximately 1.89 inches of precipitation, and the average site-wide groundwater elevation increased approximately 0.13 feet. During Third Quarter 2016, the Beaumont NWS reported approximately 0.16 inches of precipitation, and the average site-wide groundwater elevation decreased approximately 0.12 feet. Table 4 presents the range and average change in groundwater elevation by area. Figures 7 and 8, respectively, present elevation differences between the First

Quarter 2016 and Second Quarter 2016, and between the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events.

3.2 GROUNDWATER GRADIENTS

Horizontal groundwater gradients are calculated using a segmented path from well to well that approximates the overall site flowline. The horizontal gradient is a measure of the change in the hydraulic head divided by the distance between wells (i.e., the slope of the water table). The average horizontal groundwater gradient calculated between TT-MW2-16 and TT-MW2-6S for the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events for the shallow wells screened in the weathered San Timoteo formation (wSTF) was 0.030 feet per foot (ft/ft). The horizontal groundwater gradient calculated between TT-MW2-2 and TT-MW2-6D for deeper wells screened in the San Timoteo formation (STF) was 0.029 ft/ft during the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events.

Vertical groundwater gradients are calculated from individual clusters of wells. Well clusters measure the differences in static water level at different depths in the aquifer. The vertical gradient is a comparison of static water levels between wells at different depths in the aquifer, and is an indication of the vertical head difference (downward—negative gradient, upward—positive gradient) of groundwater. Vertical groundwater gradients at the site are generally downward. During the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events, the vertical gradients ranged from -0.32 ft/ft at well cluster TT-MW2-4S and -4D located in Area L, to +0.17 ft/ft at well cluster TT-MW2-19S and -19D, located on the Western Riverside County Regional Conservation Authority (RCA) property to the south of the site respectively. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 5. A complete listing of historical horizontal and vertical groundwater gradients and associated calculations is presented in Appendix F.

3.3 SURFACE WATER FLOW

During the Second Quarter 2016 and Third Quarter 2016, Tetra Tech field personnel walked the Laborde Canyon drainage channel to determine the presence, nature, and quantity of surface water within the creek bed. Surface water was not present within the creek bed during either the Second Quarter 2016 or Third Quarter 2016 monitoring events, so stream flow measurements were not taken.

3.4 ANALYTICAL DATA SUMMARY

All groundwater samples collected during the Second Quarter 2016 monitoring event were analyzed for perchlorate. Select wells were also sampled for volatile organic compounds (VOCs), 1,4-dioxane, and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), as indicated in Table 6. Groundwater and surface water samples were not scheduled to be collected during the Third Quarter 2016 monitoring event.

A summary of validated laboratory analytical results for analytes detected above their respective method detection limits during the Second Quarter 2016 monitoring event is presented in Table 6. Analytes with sample results above the published State Water Resources Control Board Division of Drinking Water maximum contaminant level (MCL) or the State Water Resources Control Board Division of Drinking Water drinking water notification level (DWNL) are indicated by bold type in Table 6. Table 7 presents summary statistics for validated organic and inorganic analytes detected during the monitoring event. A complete list of the analytes tested, along with validated sample results by analytical method, is provided in Appendix G. Laboratory analytical data packages, which include all environmental, field quality control (QC), and laboratory QC results, are provided in Appendix H. A consolidated laboratory data summary table is presented in Appendix I.

3.4.1 Data Quality Review

The quality control samples were reviewed as described in the *Revised Programmatic Sampling and Analysis Plan, Beaumont Sites 1 and 2* (Tetra Tech, 2016). The data for the groundwater sampling activities were contained in analytical data packages generated by American Environmental Testing Laboratories, Inc. and EMAX Laboratories, Inc. These data packages were reviewed using the latest versions of the United States Environmental Protection Agency *National Functional Guidelines* for organic and inorganic superfund data review (USEPA, 2014a and 2014b).

Preservation criteria, holding times, field blanks, laboratory control samples, method blanks, duplicate environmental samples, spiked samples, and surrogate and spike recovery data were reviewed. Within each environmental sample, the sample-specific quality control spike recoveries were examined. These data examinations included comparing statistically calculated control limits to percent recoveries of all spiked analytes and duplicate spiked analytes. Relative percent difference (RPD) control limits were compared to actual spiked (matrix spike/matrix spike duplicate [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 SW6850 for perchlorate, Method SW8270C SIM for 1,4-dioxane, Method SW8330A for RDX, and Method SW8260B for VOCs. All data results met required criteria, are of known precision and accuracy, did not require qualification, and may be used as reported.

3.5 CHEMICALS OF POTENTIAL CONCERN

The identification of chemicals of potential concern is an ongoing process that takes place annually as part of the second quarter sampling event, and is reported in each year's Second Quarter and Third Quarter Semiannual Groundwater Monitoring Report. The purpose of identifying chemicals of potential concern is twofold: to establish a list of analytes that best represents the extent and magnitude of affected groundwater, and to focus more detailed analysis on those analytes. The analytes were organized and evaluated in two groups, organic and inorganic, and divided into primary and secondary chemicals of potential concern. Table 6 presents a summary of the validated organic and inorganic analytes detected during the Second Quarter 2016 monitoring event.

The identification process for chemicals of potential concern does not eliminate analytes from testing, but does reduce the number of analytes that are evaluated and discussed during reporting. All of the secondary chemicals of potential concern will continue to be tested during future monitoring events because of their association with other analytes that are listed as primary chemicals of potential concern. However, they are not discussed further because they are detected on a more limited or inconsistent basis, and/or are detected at concentrations below a regulatory threshold. The standard list of analytes for each method will continue to be tested and screened annually to ensure that the appropriate chemicals of potential concern are being identified and evaluated. Table 8 presents a summary of the Laborde Canyon chemicals of potential concern. Time-series graphs of perchlorate, trichloroethene (TCE), and 1,4-dioxane concentrations are provided in Appendix E.

3.5.1 Organic Analytes

Seven organic analytes (RDX, 1,4-dioxane, carbon tetrachloride, 1,2-dichloroethane [1,2-DCA], 1,1-dichloroethene [1,1-DCE], *cis*-1,2-dichloroethene [*cis*-1,2-DCE], and TCE) were detected above their respective MCL or DWNL during the Second Quarter 2016 monitoring event.

RDX was detected above the DWNL of 0.3 micrograms per liter (µg/L) in the groundwater sample collected from monitoring well TT-MW2-13 during the Second Quarter 2016 monitoring event, at a concentration of 0.38 µg/L. Monitoring well TT-MW2-13 is located in Area K.

1,4-Dioxane was reported in groundwater samples below the DWNL of 1.0 µg/L in three wells (TT-MW2-06S, TT-MW2-27, and TT-MW2-37B) and above the DWNL in four wells (TT-MW2-09S, TT-MW2-22, TT-MW2-24, and TT-MW2-37A) during the Second Quarter 2016 monitoring event, at concentrations ranging from 19.5 to 105 µg/L. All wells with 1,4-dioxane detections are located within or downgradient from the former waste discharge area (WDA). Time-series graphs of 1,4-dioxane are provided in Appendix E.

1,2-DCA was reported above the MCL of 0.5 µg/L two groundwater samples collected from monitoring wells TT-MW2-22 and TT-MW2-24 during the Second Quarter 2016 monitoring event, at concentrations of 1.35 and 1.18 µg/L, respectively. Monitoring well TT-MW2-22 is located in the former WDA, and monitoring well TT-MW2-24 is located immediately downgradient from the former WDA.

1,1-DCE was reported above the MCL in the groundwater sample collected from monitoring well TT-MW2-22 during the Second Quarter 2016 monitoring event, at a concentration of 15 µg/L. Monitoring well TT-MW2-22 is located in the former WDA.

The compound *cis*-1,2-DCE was reported above the MCL of 6 µg/L in the groundwater sample collected from monitoring well TT-MW2-22 (in the former WDA) during the Second Quarter 2016 monitoring event, at a concentration of 15.6 µg/L. Carbon tetrachloride was reported above the MCL of 0.5 µg/L in the groundwater sample collected from monitoring well TT-MW2-24 (immediately downgradient from the former WDA) during the Second Quarter 2016 monitoring event, at a concentration of 1.12 µg/L. TCE was reported below the MCL of 5 µg/L in groundwater samples collected from two monitoring wells (TT-MW2-9S and TT-MW2-21) located in, or just downgradient from, the former WDA during the Second Quarter 2016 monitoring event at concentrations ranging from 0.870 to 4.76 µg/L. TCE was above the MCL in groundwater samples collected from three groundwater monitoring wells (TT-MW2-22, TT-MW2-24, and TT-MW2-37A) located in, or just downgradient from, the former WDA during the Second Quarter 2016 monitoring event at concentrations ranging from 5.85 to 424 µg/L. TCE was also detected below the MCL in monitoring well TT-MW2-11 (Area M) and TT-MW2-17S (Area K) at concentrations of 2.85 and 0.590 µg/L, respectively. TCE was detected above the MCL in monitoring well TT-MW2-17D (Area K), at a concentration of 6.92 µg/L during the Second Quarter 2016 monitoring event. Time-series graphs of TCE are provided in Appendix E.

Four additional organic analytes (bromodichloromethane, bromoform, dibromochloromethane, and chloroform) were detected above their respective MCLs in monitoring well TT-MW2-24. Based on historic analytical information for this well, these data are considered anomalous and are likely caused by contamination from an outside source.

Other organic analytes detected at low levels during the Second Quarter 2016 groundwater monitoring event were 1,1-dichloroethane, detected in two wells, and chloromethane, detected in one well. 1,1-Dichloroethane was not detected above its MCL of 5 µg/L and chloromethane does not have an established MCL or DWNL. Neither of these compounds detected consistently from event to event.

3.5.2 Inorganic Analytes

One inorganic analyte (perchlorate) was detected in groundwater above a published MCL. Table 6 presents a summary of validated inorganic analyte concentrations reported in groundwater samples collected during the Second Quarter 2016 groundwater monitoring event.

During the Second Quarter 2016, perchlorate was reported below the MCL of 6 µg/L in groundwater samples collected from 21 of the 49 monitoring wells sampled; it was reported above the MCL in groundwater samples collected from 20 of the 49 monitoring wells sampled. The highest perchlorate concentrations during the Second Quarter 2016 were found at monitoring well TT-MW2-38A (77,100 µg/L) and TT-MW2-39 (97,900 µg/L), located in Test Bay 3 in Area K; and in monitoring well TT-MW2-24 (84,300 µg/L), located in the former WDA. Time-series graphs of perchlorate are provided in Appendix E.

3.5.3 Chemicals of Potential Concern

Given the analysis above and the concentrations detected during previous groundwater monitoring events, perchlorate, TCE, and 1,4-dioxane are identified as primary chemicals of potential concern, and benzene, 1,2-DCA, 1,1-DCE, *cis*-1,2-DCE, and RDX are identified as secondary chemicals of potential concern at the site. The remaining two organic analytes (1,1-dichloroethane and chloromethane) were detected below their respective MCLs. The distribution and concentrations in groundwater for all chemicals of potential concern will continue to be monitored and the results evaluated. Figures 9, 10, and 11 present isoconcentration maps for 1,4-dioxane, TCE, and perchlorate for groundwater samples collected during the Second Quarter 2016 monitoring event.

3.6 SURFACE WATER SAMPLING RESULTS

Surface water sampling locations were dry during the Second Quarter 2016 sampling event so samples were not collected. No other surface water or storm water samples were scheduled to be collected during this reporting period.

3.7 TEMPORAL TRENDS IN GROUNDWATER CHEMICAL CONCENTRATIONS

All groundwater and surface water monitoring locations sampled and tested between Fourth Quarter 2015 and Third Quarter 2016 were included in the trend analyses. Samples were collected from 49 monitoring wells. Temporal trend analyses were performed for perchlorate, TCE, 1,4-dioxane, and RDX. The temporal trend analyses used data from the entire period of record (September 2004 through September 2016) to evaluate long-term trends at the site, and to assess the variability observed in the data, since sampling results at many locations fluctuate considerably from quarter to quarter.

Time trend analysis was conducted using the Monitoring and Remediation Optimization System (MAROS) developed by the Air Force Center for Environmental Excellence (AFCEE, 2006). MAROS is a statistical database application developed to assist with groundwater quality data trend analysis and long-term monitoring optimization at contaminated groundwater sites. The software performs parametric and nonparametric trend analyses to evaluate temporal and spatial contaminant trends using Mann-Kendall and linear regression methods. Brief descriptions of the methods follow.

- Mann-Kendall Analysis – This statistical procedure was used to evaluate the data for trends. It is a nonparametric statistical procedure that is well suited for analyzing trends in data over time that do not require assumptions as to the statistical distribution of the data and can be used with irregular sampling intervals and missing data. The Mann-Kendall test for trends is suitable for analyzing data that follow a normal or non-normal distribution pattern. The advantage with this approach involves cases where outliers in the data would produce biased estimates of the least squares estimated slope.

- Linear Regression Analysis – This statistical procedure was used to estimate the magnitude of the trends. A parametric statistical procedure is typically used for analyzing trends in data over time and requires a normal statistical distribution of the data.

The following seven statistical concentration trend types are derived from Mann-Kendall analysis: (1) decreasing, (2) increasing, (3) no trend (displaying two sets of conditions), (4) probably decreasing, (5) probably increasing, (6) stable, and (7) non-detect (with all sample results below the detection limit). If a location has fewer than four quarters of data, then the Mann-Kendall analysis cannot be run, and not applicable (NA) is applied to the results. The criteria used to evaluate the statistical concentration trend types are summarized in Table 9.

The Mann-Kendall statistic (S) measures the trend in the data. Positive values indicate an increase in constituent concentrations over time, whereas negative values indicate a decrease in constituent concentrations over time. The strength of the trend is proportional to the magnitude of the Mann-Kendall statistic (i.e., large magnitudes indicate a strong trend).

The coefficient of variation (COV) is a statistical measure of how the individual data points vary about the mean value. Values less than or near 1.00 indicate that the data form a relatively close group about the mean value. Values larger than 1.00 indicate that the data show a greater degree of scatter about the mean.

The confidence in trend is the statistical confidence that the constituent concentration is increasing ($S>0$) or decreasing ($S<0$).

Temporal trends were analyzed for up to four analytes in 49 monitoring wells and one storm water sampling location. Any single location may have different trends for each of the four analytes evaluated. The results of the Mann-Kendall trend analysis are provided in Appendix J; summaries of the Mann-Kendall results are presented in Table 10 (groundwater) and Table 11 (surface water).

Twenty-two probably increasing or increasing trends were found at 16 groundwater monitoring locations. Listed below are the areas of the site where they are located, the location identifications, the chemical of potential concern that has the increasing or probably increasing trend, the Second Quarter 2016 analytical results, and the magnitude of the trend in percent per year (%/yr).

Eight wells located in Area K:

- TT-MW2-1: perchlorate (6,850 µg/L, 4.93 %/yr)
- TT-MW2-17S: TCE (0.590 µg/L, 8.94 %/yr)
- TT-MW2-17D: TCE (6.92 µg/L, 13.1 %/yr)
- TT-MW2-29B: perchlorate (1.02 µg/L, 13.0 %/yr)
- TT-MW2-30B: perchlorate (5000 µg/L, 18.3 %/yr)
- TT-MW2-33A: perchlorate (1.33 µg/L, 14.8 %/yr)
- TT-MW2-34A: perchlorate (5.41 µg/L, 27 %/yr)
- TT-MW2-40A: perchlorate (1.24 µg/L, 29 %/yr)

One well located in Area L:

- TT-MW2-4S: perchlorate (0.54 µg/L, 4.93 %/yr)

Four wells located in the former WDA:

- TT-MW2-21: perchlorate (2.52 µg/L, 22 %/yr) and TCE (4.76 µg/L, 15.0 %/yr)
- TT-MW2-22: TCE (424 µg/L, 7.30 %/yr) and 1,4-dioxane (78.6 µg/L, 8.21 %/yr)
- TT-MW2-37A: perchlorate (9,380 µg/L, 27 %/yr), TCE (5.85 µg/L, 20 %/yr), and 1,4-dioxane (22.4 µg/L, 9.86 %/yr)
- TT-MW2-37B: perchlorate (0.92 µg/L, 18.3 %/yr)

Three wells located just downgradient and cross gradient, respectively, of the former WDA:

- TT-MW2-9S: perchlorate (7,710 µg/L, 26 %/yr), TCE (0.870 µg/L, 15.7 %/yr), and 1,4-dioxane (19.5 µg/L, 8.76 %/yr)
- TT-MW2-27: perchlorate (174 µg/L, 13.3 %/yr)

- TT-MW2-42A: perchlorate (0.255 µg/L, 9.86 %/yr)

One storm water location, SW-07, was evaluated for perchlorate trends. The location was found to have no trend. No other surface water trends or locations were evaluated.

Table 12 summarizes the magnitude of the trend changes in micrograms per liter per year (µg/L/yr) and the percent change with respect to the mean experienced at the site through the end of this reporting period (Third Quarter 2016). The trends and trend magnitudes were generated using the MAROS software. Figures 12 through 15 present a spatial representation of the results of the trend analysis for monitoring well locations. Tables 13 through 15 summarize historical trend analysis results by chemical, and Table 16 provides a summary of increasing trends identified during the Second Quarter 2016 trend analysis by well.

3.8 GROUNDWATER MONITORING PROGRAM AND THE GROUNDWATER QUALITY MONITORING NETWORK

Quarterly groundwater monitoring has been conducted continuously at the site since the September 2004 well installation activities. Groundwater samples have been routinely analyzed for VOCs, perchlorate, 1,4-dioxane, and RDX. Selected testing for California Assessment Manual 17 Metals, general minerals, N-nitrosodimethylamine, 1,2,3-trichloropropane, and hexavalent chromium has also previously been performed. In accordance with the site *Groundwater Sampling and Analysis Plan* (Tetra Tech, 2007a), the analytical scheme, the classifications of the wells in the network, and the corresponding sampling frequency are evaluated annually during the second quarter of each year. Changes may then be proposed to accommodate expanded site knowledge or changing site conditions.

3.8.1 Groundwater Sampling Frequency

The primary criterion used in determining the frequency of sampling a monitoring well is the well classification (i.e., function of each well) (Tetra Tech, 2007a). Classification of groundwater monitoring wells is based on the evaluation of the temporal trends, spatial distribution analyses, and other qualitative criteria. During the current reporting period, horizontal extent wells, vertical distribution wells, increasing contaminant trend wells, and guard wells were sampled. Table 17 presents a summary of the current frequency of groundwater sampling by well classification.

3.8.2 Increasing Trend Wells

The sampling frequency for wells with an increasing trend may be increased if the magnitude of the trend and the location of the well warrant an increased frequency. Regardless of the outcome of the trend analysis, guard wells will continue to be sampled semiannually. For the Second Quarter 2016 trend analysis, 11 of the 16 locations with increasing or probably increasing trends for perchlorate, 1,4-dioxane, or TCE had trend magnitudes of less than 20% per year. The seven locations with these low magnitude trends are considered to be less critical than the seven locations with magnitudes greater than 20% per year. The latter group of seven locations are considered to involve increasing trend wells for well classification purposes.

Taking into account the results of the temporal trend analysis and the magnitude of their trends, Tetra Tech proposes to continue semiannual sampling for the following five increasing trend wells:

- Area K wells TT-MW2-34A, and TT-MW2-40A
- Waste discharge area wells TT-MW2-21 and TT-MW2-37A,
- Lower Canyon Area well TT-MW2-9S

We propose that the following monitoring wells remain at their presently approved sampling frequency, due to the limited magnitude of their trends:

- Area K wells TT-MW2-1, TT-MW2-17S, TT-MW2-17D, TT-MW2-29B, and TT-MW2-33A
- Area L well TT-MW2-4S
- Waste discharge area well TT-MW2-22
- Lower Canyon Area wells TT-MW2-27 and TT-MW1-42A

We propose that the sampling frequency of the following monitoring wells be changed from semiannual to annual, based on the limited magnitude of their trends:

- Area K well TT-MW2-30B (vertical extent)
- Waste discharge area well TT-MW2-37B (vertical extent)

In addition, we propose to add 1,4-dioxane to the sampling program for monitoring well TT-MW2-6D.

Table 18 summarizes the proposed monitoring well sampling schedule and frequency for the 2017 calendar year.

3.9 HABITAT CONSERVATION

Consistent with the United States Fish and Wildlife Service (USFWS) approved Habitat Conservation Plan (HCP) (USFWS, 2005) and subsequent clarifications (Lockheed Martin Corporation, 2006a and 2006b) to the HCP describing activities for environmental remediation at the site, field activities were performed under the supervision of a USFWS-approved biologist. No impact to the Stephens' kangaroo rat occurred during the performance of field activities related to the Second Quarter 2016 and Third Quarter 2016 monitoring events.

Section 4
Summary and Conclusions

This section summarizes the results of the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events.

4.1 GROUNDWATER ELEVATION AND GRADIENT

Taking into account the measured groundwater elevations, the current conceptual site model, and the southward sloping topography at the site, groundwater flow is to the south, generally following the topography of Laborde Canyon. During Second Quarter 2016, groundwater elevation increases were seen in all areas. During Third Quarter 2016, groundwater elevation decreases were seen in Area L (former burn area), the lower canyon area, Area M (former garbage disposal area), and the Western Riverside County Regional Conservation Authority property. Groundwater elevation increases were seen in all other areas of the site. The overall groundwater elevation at the site has decreased since Fourth Quarter 2005, with the greatest decrease over time seen in monitoring well TT-MW2-1 (9.49 feet). Limited seasonal fluctuations can be seen to varying degrees following periods of precipitation. The overall long-term decreasing trend in groundwater elevation appears to generally correspond to long-term precipitation patterns.

The horizontal hydraulic gradients calculated between TT-MW2-16 and TT-MW2-6S from the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events for the weathered San Timoteo formation-screened wells averaged 0.030 feet per foot (ft/ft). The horizontal groundwater gradients calculated between TT-MW2-2 and TT-MW2-6D for the Second Quarter 2016 and Third Quarter 2016 groundwater monitoring events for the deeper San Timoteo formation-screened wells averaged 0.029 ft/ft. Vertical gradients are generally downward on-site and upward from the site boundary south. The vertical gradients range from -0.32 ft/ft to +0.17 ft/ft. A summary of calculated horizontal and vertical groundwater gradients is presented in Table 5 and in Appendix F.

4.2 SURFACE WATER FLOW RESULTS

Surface water was not present in the stream beds during the Second Quarter 2016 and Third Quarter 2016 monitoring events.

4.3 SURFACE WATER AND STORM WATER SAMPLING RESULTS

During the Second Quarter 2016 sampling event, all surface water locations were dry so no samples were collected. No other surface water or storm water samples were collected during this reporting period.

4.4 GROUNDWATER SAMPLING RESULTS

4.4.1 Groundwater Sampling Results

Area J – Final Assembly

Area J wells were not scheduled to be sampled during Second Quarter 2016. Site chemicals of potential concern have not been detected previously above their respective maximum contaminant level or drinking water notification level in Area J.

Area K – Test Bays and Miscellaneous Facilities

Results for Area K during the Second Quarter 2016 include the following:

- Perchlorate concentrations ranged from below the method detection limit to 97,900 micrograms per liter (μg/L) in TT-MW2-39. The maximum contaminant level for perchlorate is 6 μg/L. Area K has been identified as a source of perchlorate in groundwater.
- Trichloroethene was detected above the maximum contaminant level of 5 μg/L in well TT-MW2-17D (6.92 μg/L). Trichloroethene was not detected in other wells in Area K. The source of the trichloroethene is unknown.
- Hexadydro-1,3,5-trinitro-1,3,5-triazine was detected at a concentration of 0.38 μg/L in well TT-MW2-13. The drinking water notification level for hexadydro-1,3,5-trinitro-1,3,5-triazine is 0.3 μg/L. Previously, hexadydro-1,3,5-trinitro-1,3,5-triazine was also detected in monitoring well TT-MW2-1, but has not been detected in this well since October 2007. The source of the hexadydro-1,3,5-trinitro-1,3,5-triazine has been investigated but remains unknown (Tetra Tech, 2010a).

Area L – Propellant Burn Area

Results for Area L for the Second Quarter 2016 include the following:

- Perchlorate was detected in monitoring wells TT-MW2-4S, TT-MW2-10, TT-MW2-12, and TT-MW-35A at concentrations of 0.538 µg/L, 0.236 µg/L, 0.132 µg/L, and 0.193 µg/L, respectively. There is no indication that a perchlorate source is present in Area L; the perchlorate detected in the northernmost portion of Area L appears to have originated upgradient in Area K.

Area M - Garbage Disposal Area

Results for Area M for the Second Quarter 2016 include the following:

- Perchlorate was detected above the MCL in monitoring well TT-MW2-11 at a concentration of 179 µg/L. Perchlorate was also detected below the MCL in monitoring well TT-MW2-28 at a concentration of 0.108 µg/L. Area M has been identified as a source of perchlorate in groundwater.

- Trichloroethene was detected in one well (TT-MW2-11) at a concentration of 2.85 µg/L. Trichloroethene has not been detected in other wells in Area M.

Waste Discharge Area

Results for the former waste discharge area during the Second Quarter 2016 include the following:

- Perchlorate concentrations ranged from below the method detection limit to 84,300 µg/L in well TT-MW2-24. The former waste discharge area has been identified as a source of perchlorate in groundwater.

- Trichloroethene concentrations ranged from below the method detection limit to 424 µg/L in well TT-MW2-22. The former waste discharge area has been identified as a source of trichloroethene in groundwater. However, trichloroethene has not been detected above the maximum contaminant level of 5 µg/L in downgradient monitoring wells.

- 1,4-Dioxane concentrations ranged from below the method detection limit to 105 µg/L in well TT-MW2-24. The drinking water notification level for 1,4-dioxane is 1 µg/L. This area has been identified as a source of 1,4-dioxane in groundwater, and this constituent has been detected in monitoring wells downgradient of the former waste discharge area.

- Hexadydro-1,3,5-trinitro-1,3,5-triazine was detected at a concentration of 0.20 µg/L in TT-MW2-24. Hexadydro-1,3,5-trinitro-1,3,5-triazine has not been detected in other wells located in, or downgradient of, the former waste discharge area.

Lower Canyon and Riparian Corridor

Results for the lower portion of Laborde Canyon, from the area immediately downgradient of the former waste discharge area to the riparian area immediately south of the property boundary, include the following:

- Perchlorate was detected in groundwater during the Second Quarter 2016 at concentrations ranging from 7,710 µg/L in monitoring well TT-MW2-9S in the northern portion of the lower Laborde Canyon to below the method detection limit in the riparian corridor. No source of perchlorate has been identified in the lower canyon or at the southern site boundary. The perchlorate appears to have originated in the former waste discharge area.

- Trichloroethene was detected in groundwater during the Second Quarter 2016 in monitoring well TT-MW2-9S, located in the northern portion of the lower Laborde Canyon, at a concentration of 0.870 µg/L, which is below the maximum contaminant level of 5 µg/L. Trichloroethene has not been detected in other wells located in the lower canyon or riparian corridor area. The source of the trichloroethene appears to be the former waste discharge area.

- 1,4-Dioxane was detected in groundwater during the Second Quarter 2016 monitoring event at concentrations ranging from 19.50 µg/L in monitoring well TT-MW2-9S in the northern portion of the lower Laborde Canyon to below the method detection limit in the riparian corridor. No source of 1,4-dioxane has been identified in the lower canyon or at the southern site boundary. The 1,4-dioxane appears to have originated in the former waste discharge area.

Western Riverside County Regional Conservation Authority Property

- Perchlorate was detected below the maximum contaminant level of 6 µg/L in monitoring well TT-MW2-19S at a concentration of 2.37 µg/L. Perchlorate was not detected in monitoring well TT-MW2-20S.

Summary

Given the data available at this time, the trichloroethene and hexadydro-1,3,5-trinitro-1,3,5-triazine plumes in groundwater appear to be small and isolated. These plumes do not extend off-site. The 1,4-dioxane plume is limited to the former waste discharge area and lower Laborde Canyon, and does not appear to extend off-site. The perchlorate plume does appear to extend off-site, but terminates in the riparian corridor south of the southern site boundary. The perchlorate detected in monitoring well TT-MW2-19S, located on the Regional Conservation Authority property to the south of the site, suggests an isolated impacted well.

Table 18 summarizes the proposed monitoring well sampling schedule and frequency for the 2017 calendar year. The proposed changes include decreasing the sampling frequency for wells TT-MW2-30B and TT-MW2-37B based on the limited magnitude of their observed trends.

Section 5
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FIGURES

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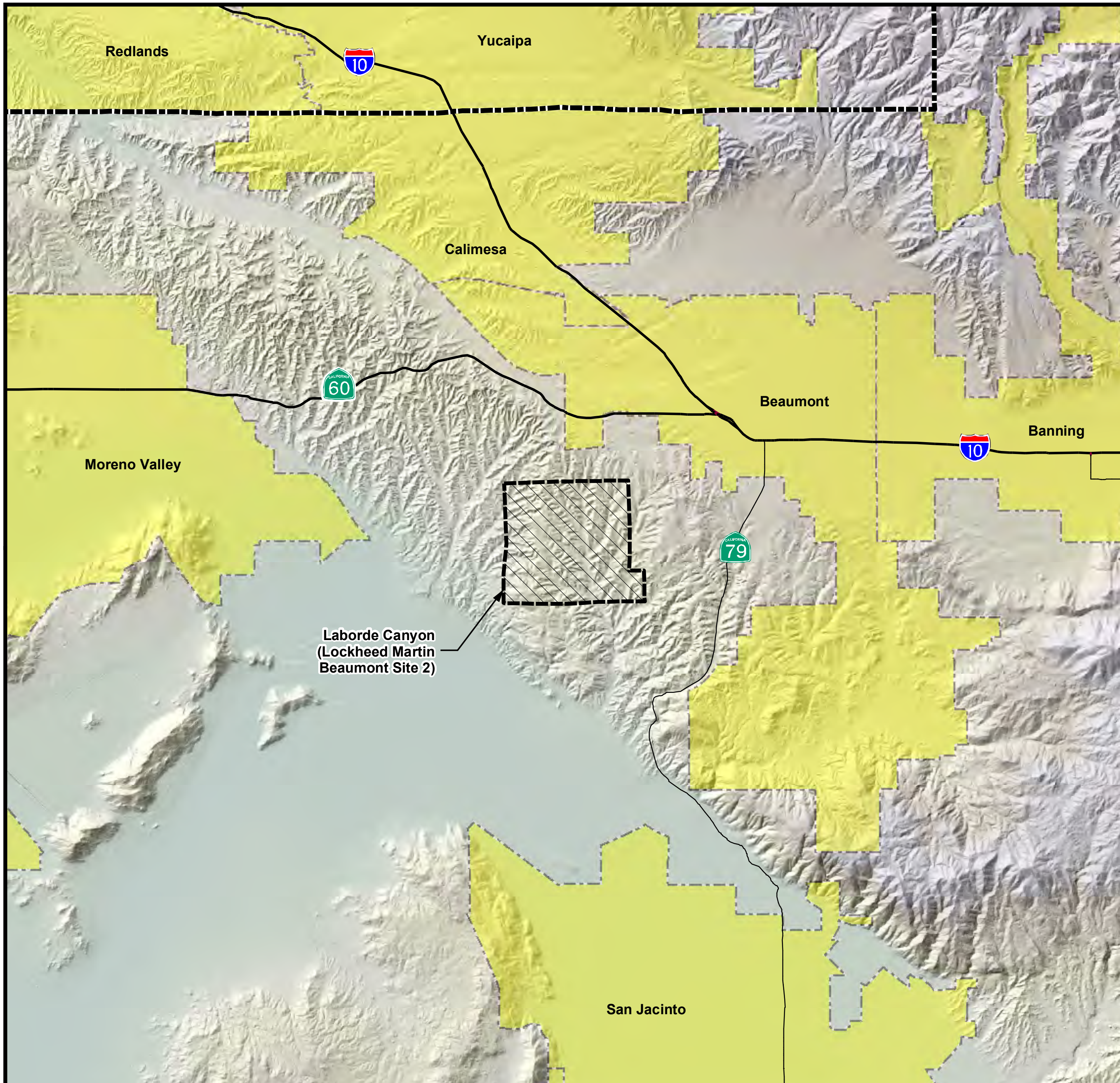

N

0 2 Miles

Adapted from:

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

LEGEND

Interstate/Freeway

State Highway

County Boundary

Laborde Canyon Site Boundary
(Lockheed Martin Beaumont Site 2)

City/Municipality

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 1

Regional Location of Laborde Canyon

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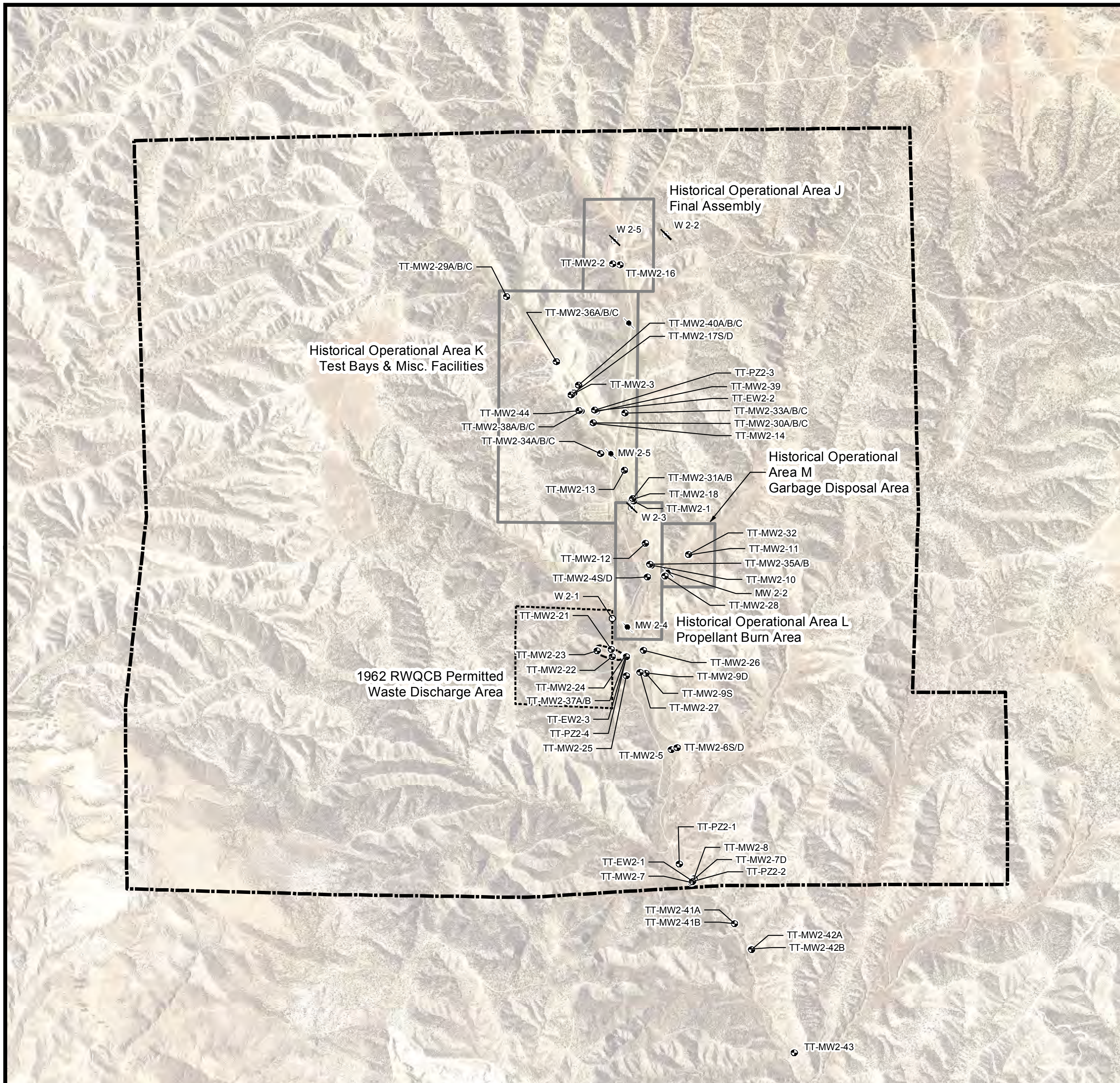

N

0 1,000 2,000
Feet

Adapted from:

July 2014 aerial photograph.

LEGEND

- Groundwater Monitoring Well Location
- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary (Lockheed Martin Beaumont Site 2)

Note: Laborde Canyon site boundary (Lockheed Martin Beaumont Site 2) from Hillwig-Goodrow survey, May 2004.

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 2
Historical Operational Areas and Site Features

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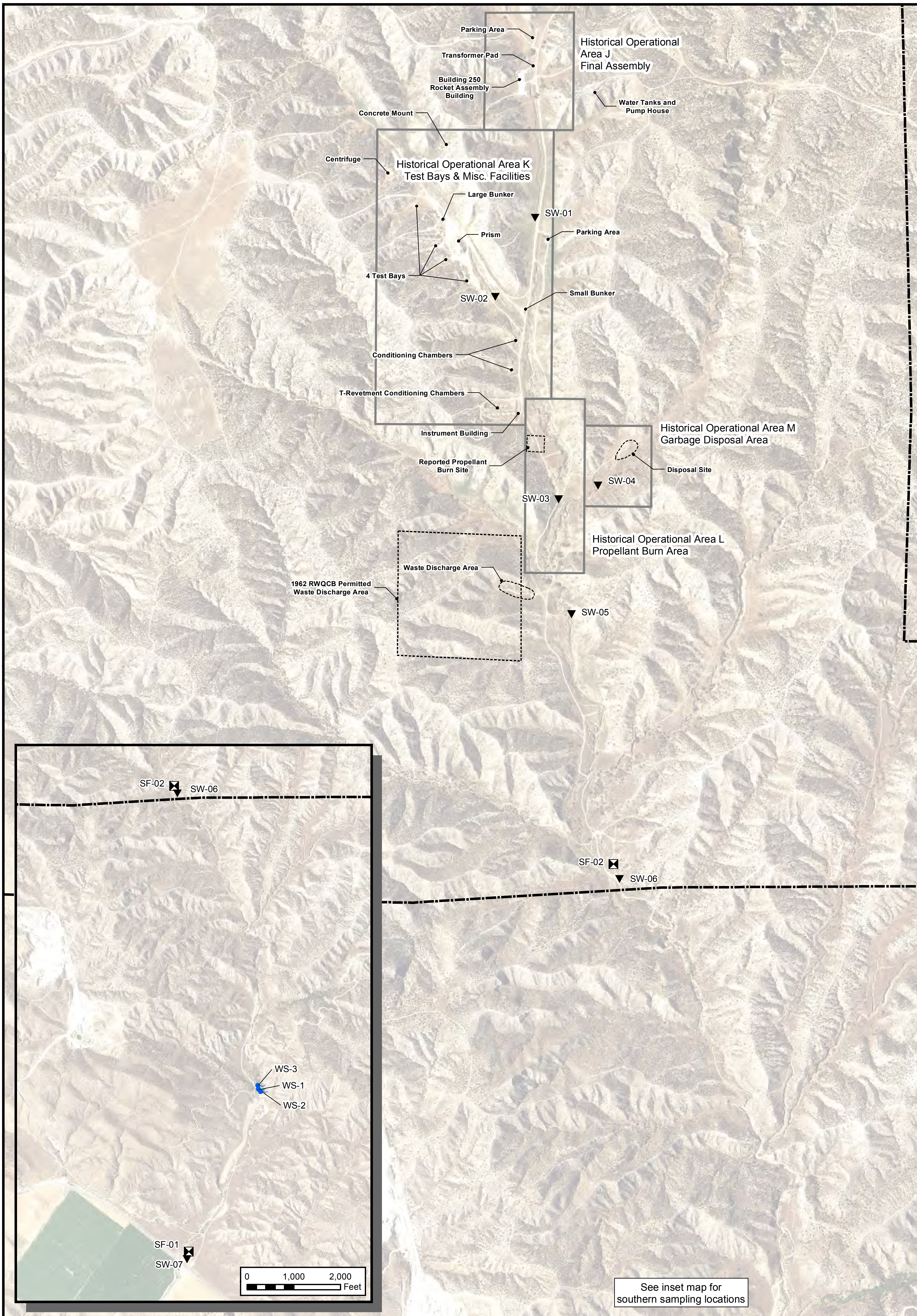


LEGEND

- ▼ Storm-Water Sampling Location
- Spring Sampling Location
- Stream Flow Sampling Point
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Property Boundary (Lockheed Martin Beaumont Site 2)

0 500 1,000
Feet

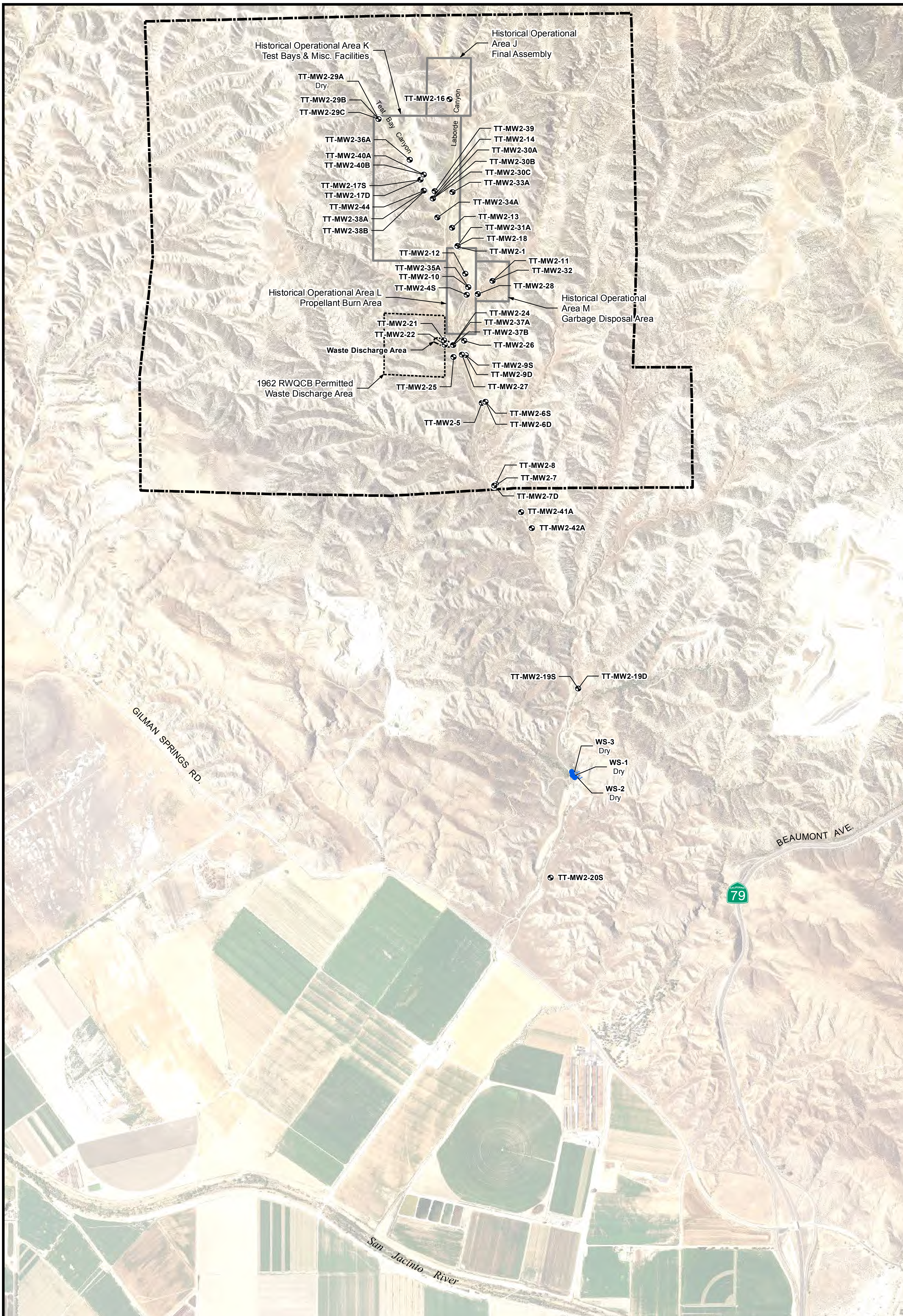
Adapted from: July 2014 aerial photograph

Note: Laborde Canyon property boundary (Lockheed Martin Beaumont Site 2) from Hillwig-Goodrow survey, May 2004.

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 3

Surface and Storm-Water Sampling Locations



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LEGEND

- Well
- Spring
- 1962 RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary (Lockheed Martin Beaumont Site 2)

Adapted from:
July 2014 aerial photograph.

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

0 1,000 2,000 Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 4
Second Quarter 2016 Sampling Locations

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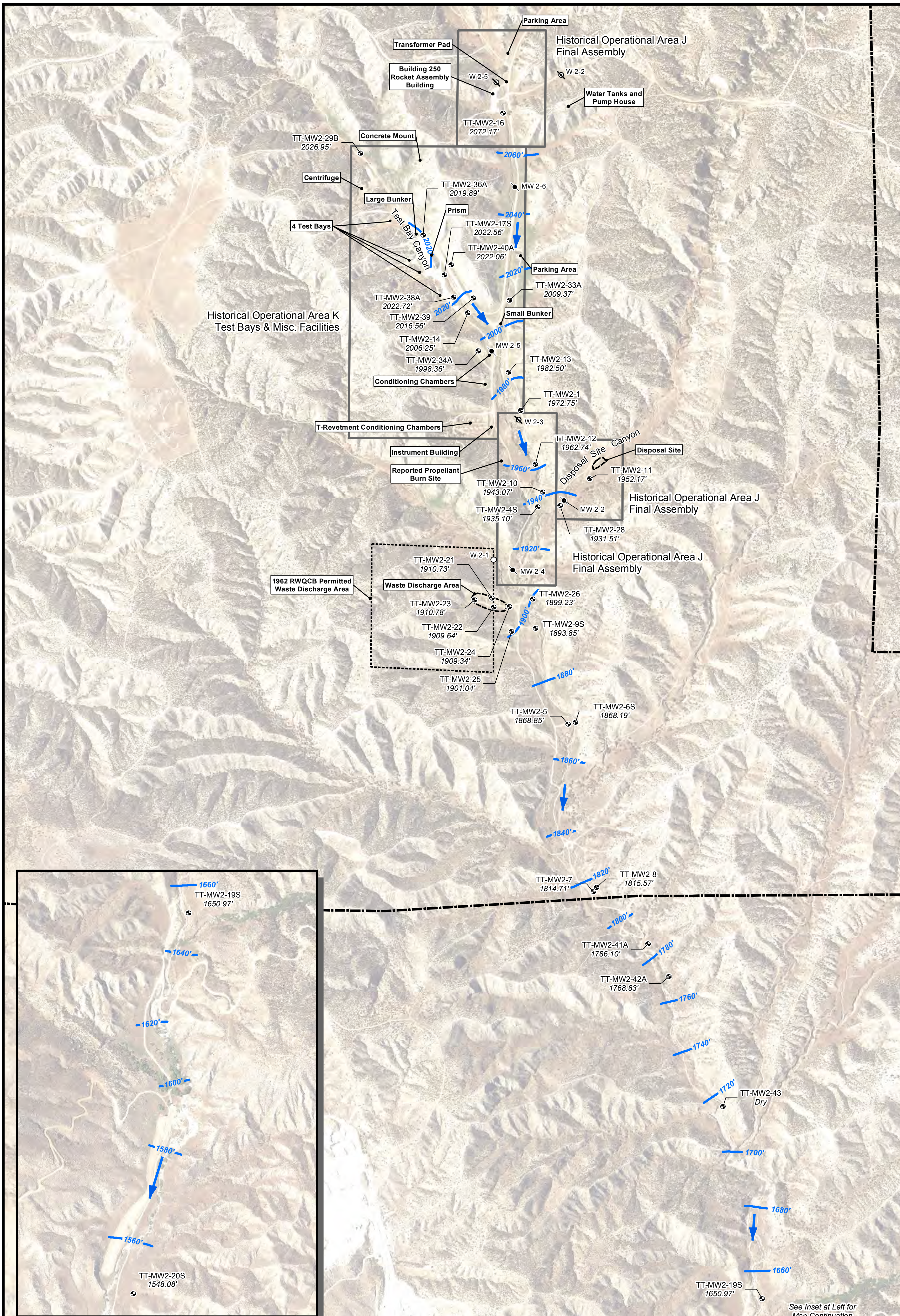


LEGEND

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

0 500 1,000 Feet

Adapted from: July 2014 aerial photograph

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

Notes: msl - mean sea level.

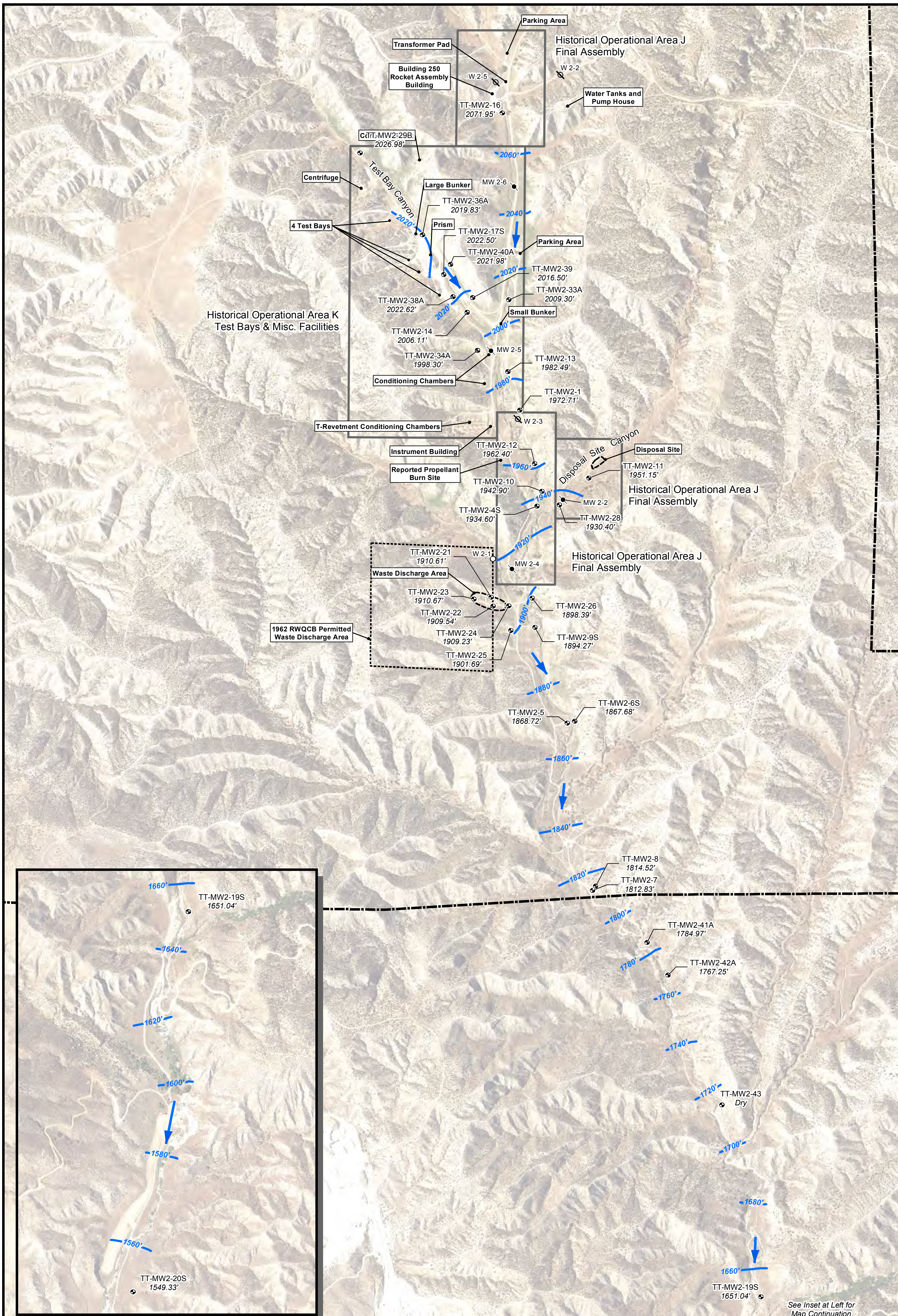
Laborde Canyon property boundary (Lockheed Martin Beaumont Site 2) from Hillwig-Goodrow survey, May 2004

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 5

Groundwater Contours for First Groundwater - Second Quarter 2016

P:\GIS\Lockheed_S2_Q2Q316GW_Elev_Q316.mxd



LEGEND

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

0 500 1,000 Feet

Adapted from: July 2014 aerial photograph

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

Notes: msl - mean sea level.

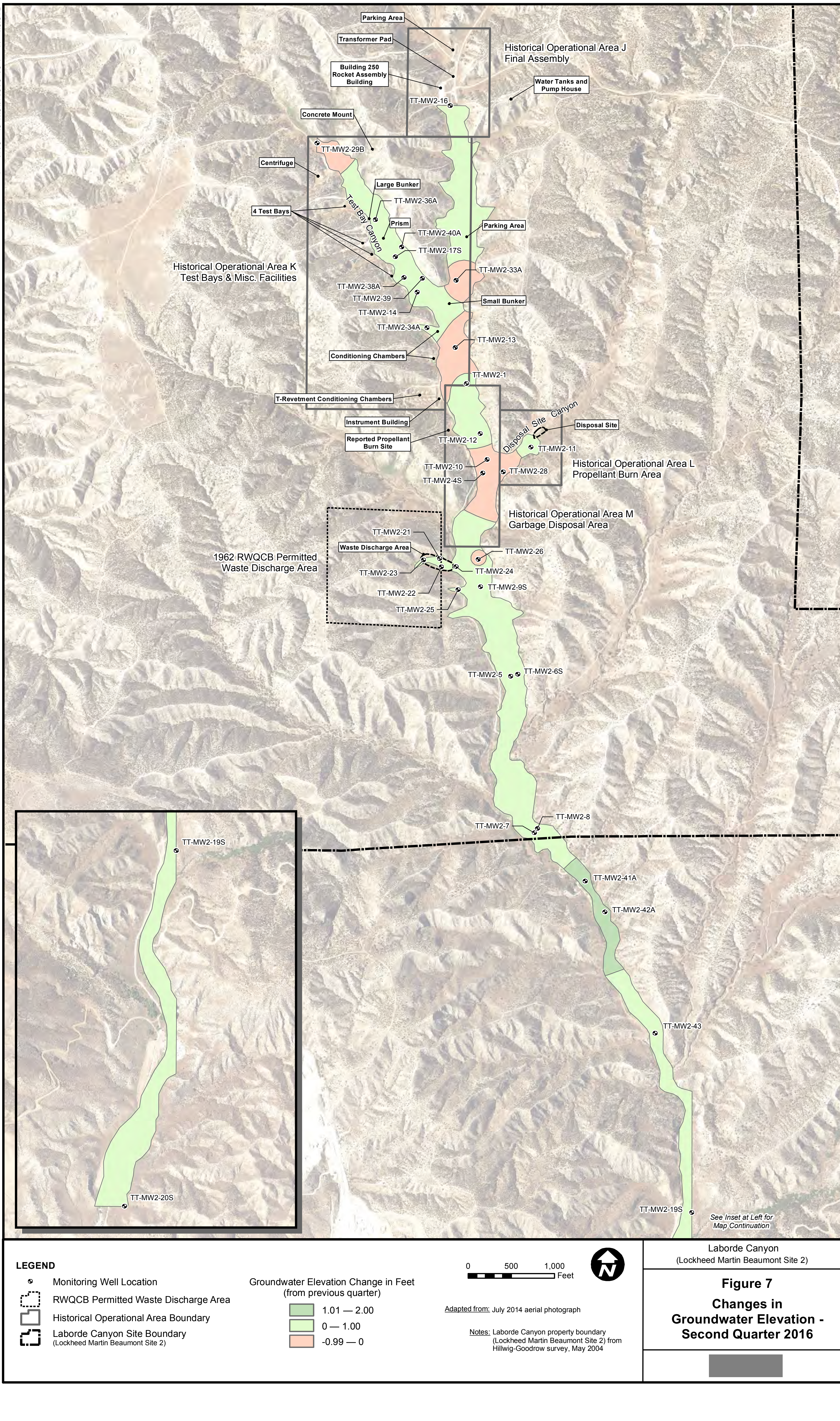
Laborde Canyon property boundary (Lockheed Martin Beaumont Site 2) from Hillwig-Goodrow survey, May 2004

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 6

Groundwater Contours for First Groundwater - Third Quarter 2016

P:\GIS\Lockheed_S2_Q2Q316GW_Chg_Q216.mxd

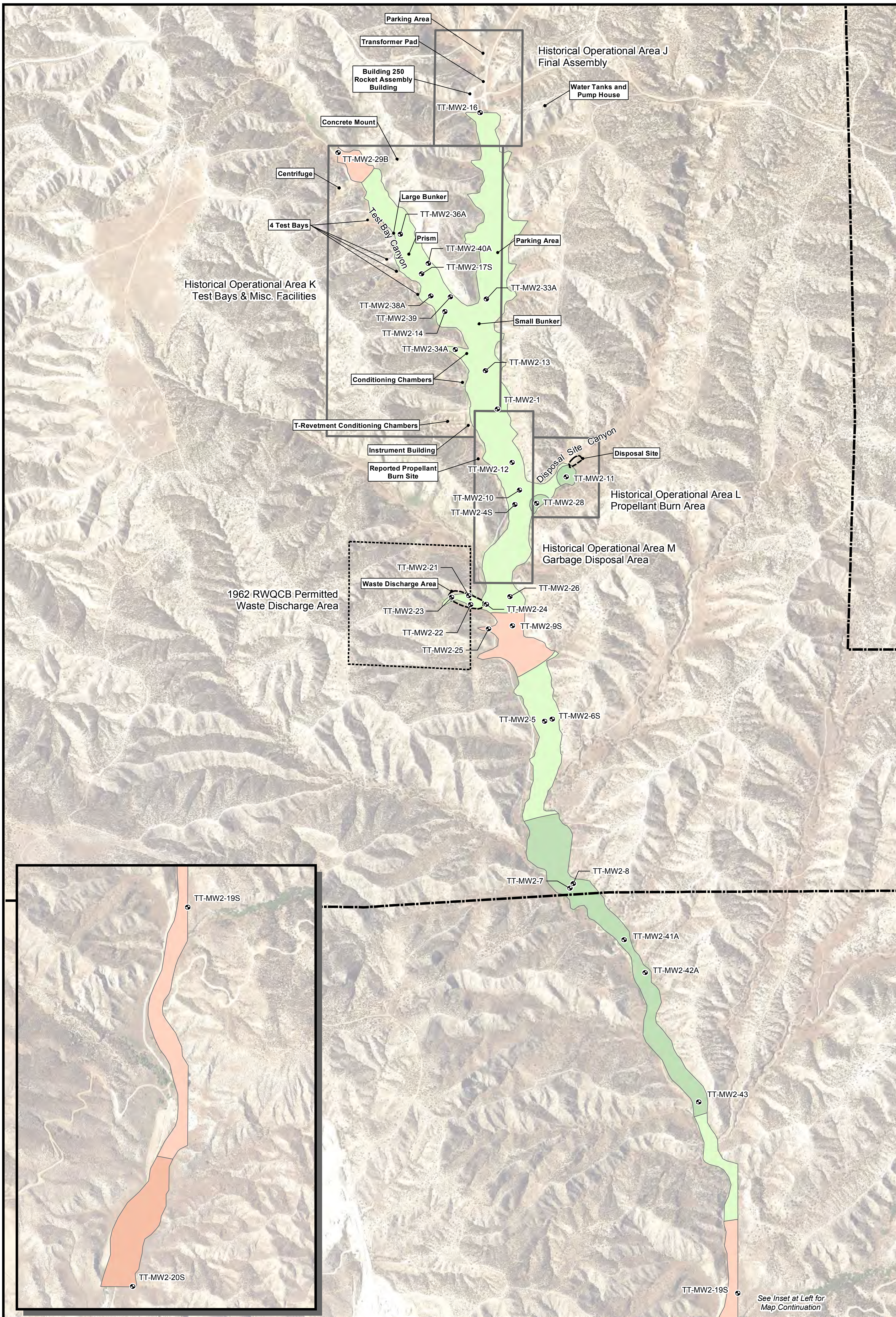


Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 7

Changes in Groundwater Elevation - Second Quarter 2016

P:\GIS\Lockheed_S2_Q2Q316GW_Chg_Q316.mxd



LEGEND

- Monitoring Well Location
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary (Lockheed Martin Beaumont Site 2)

Groundwater Elevation Change in Feet (from previous quarter)

- 1.01 — 2.00
- 0 — 1.00
- -0.99 — 0
- -1.99 — -1.00

0 500 1,000 Feet

N

Adapted from: July 2014 aerial photograph

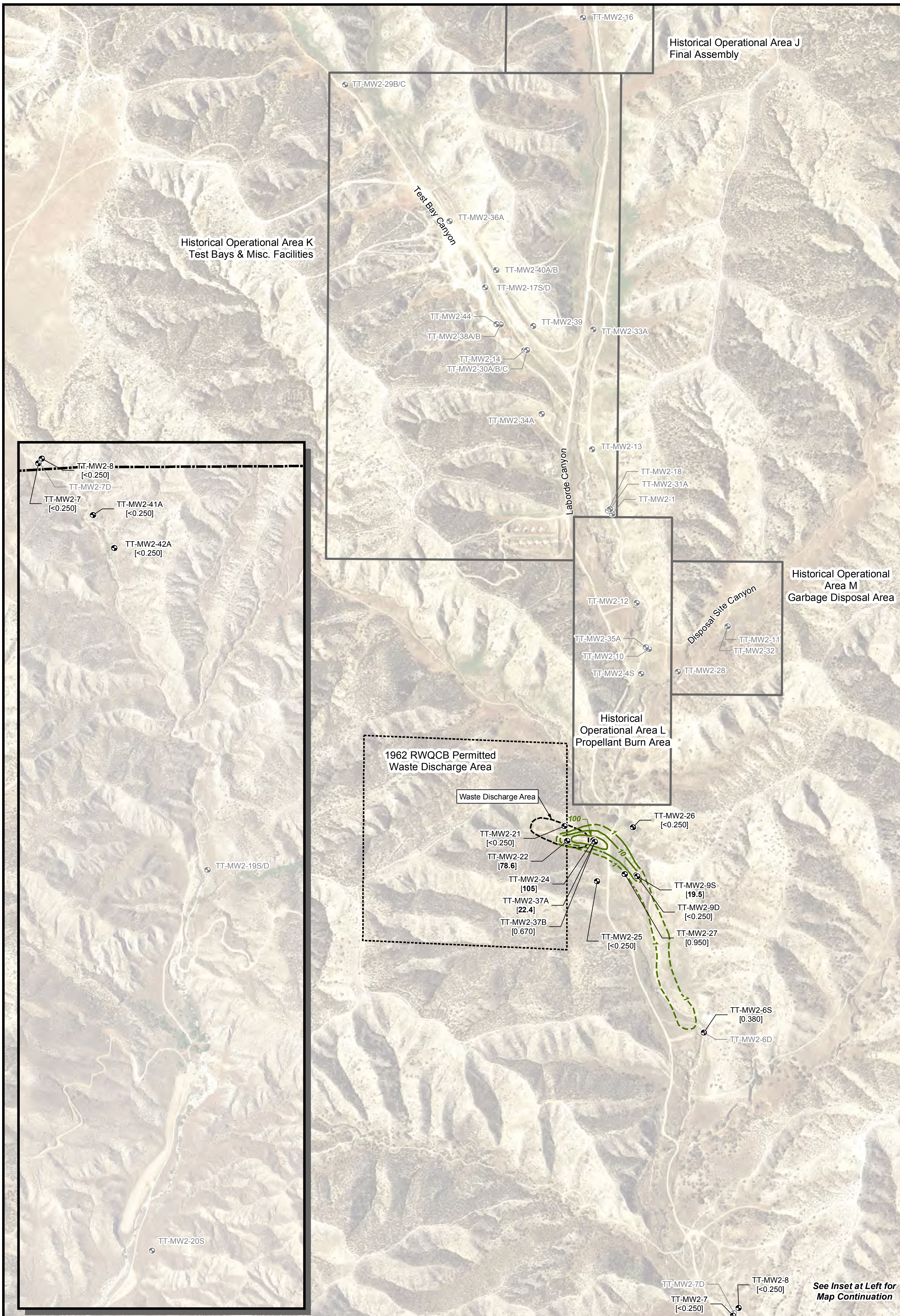
Notes: Laborde Canyon property boundary (Lockheed Martin Beaumont Site 2) from Hillwig-Goodrow survey, May 2004

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 8

Changes in Groundwater Elevation - Third Quarter 2016

Path: P:\GIS\Lockheed_S2_Q2Q316\DIOX_Isocon.mxd



LEGEND

- Well Location with 1,4-Dioxane Concentration [µg/L]
- Well Location Not Sampled for 1,4-Dioxane
- 1,4-Dioxane Isoconcentration Contour (Dashed where inferred)
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary (Lockheed Martin Beaumont Site 2)

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

Results shown for sampled locations only.

[#] Bold indicates DWNL value exceeded.

Highest concentration shown is contoured for clustered or nested well locations.

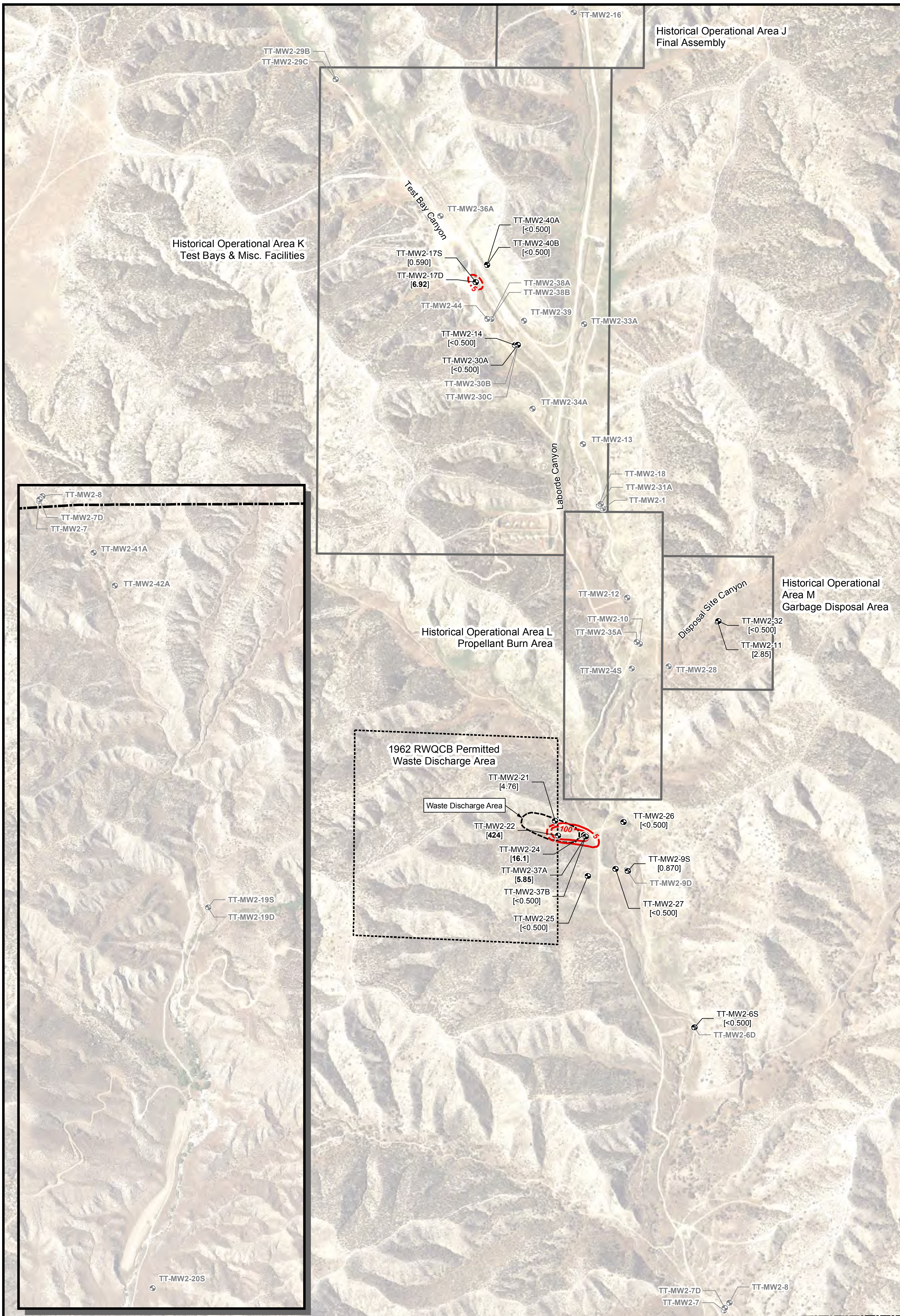
Adapted from: July 2014 aerial photograph.

0 300 600 Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 9
1,4-Dioxane
Isoconcentration Map (µg/L)
Second Quarter 2016

Path: P:\GIS\Lockheed_S2_Q2\2016\TCE_Isocon.mxd



LEGEND

- Well Location with Trichloroethene Concentration [µg/L]
- Well Location Not Sampled for Trichloroethene
- Trichloroethene Isoconcentration Contour (Dashed where inferred)
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary (Lockheed Martin Beaumont Site 2)

Adapted from: July 2014 aerial photograph.

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

Results shown for sampled locations only.

[#] Bold indicates MCL value exceeded.

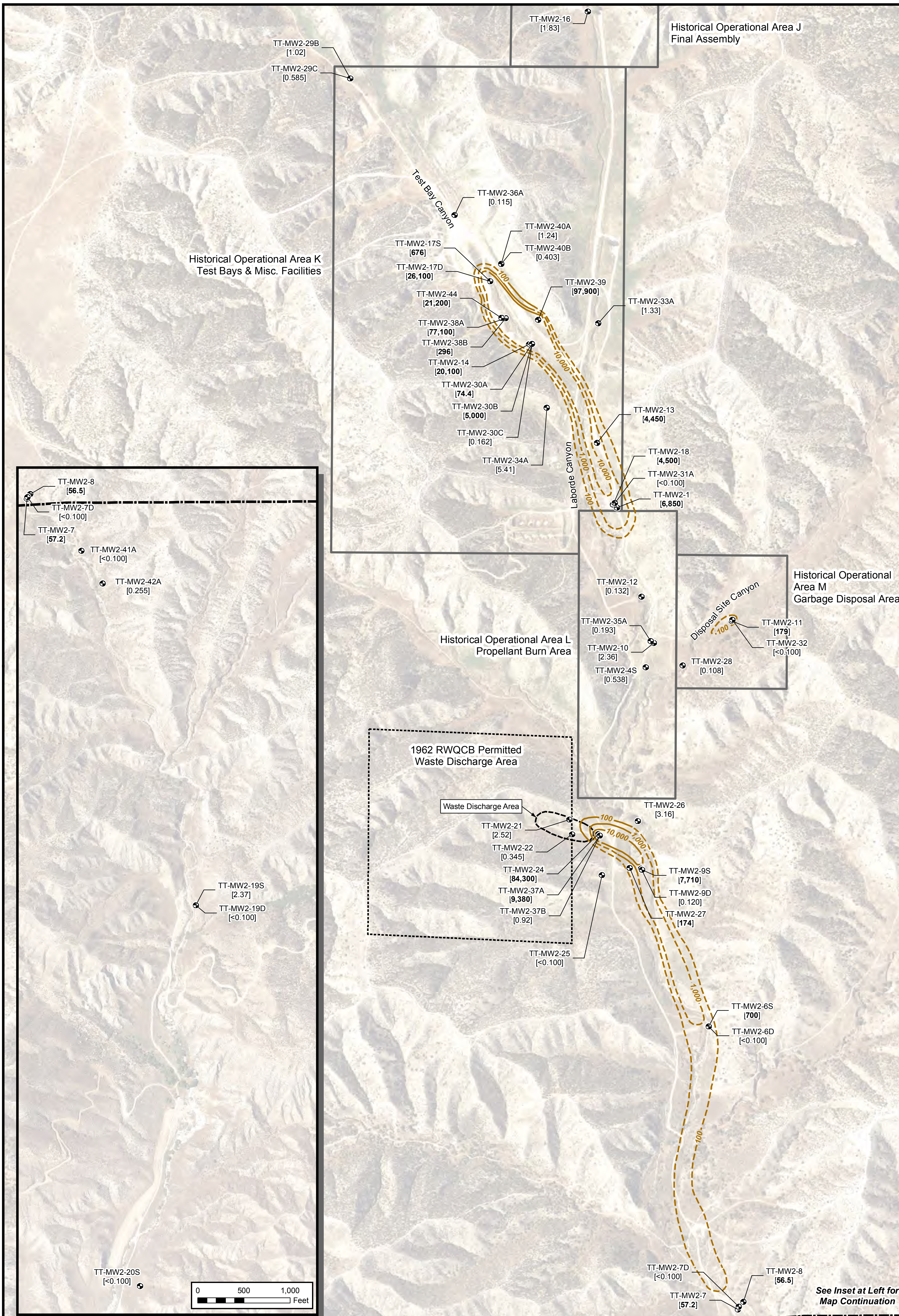
Highest concentration shown is contoured for clustered or nested well locations.

0 300 600 Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 10
Trichloroethene (TCE) Isoconcentration Map (µg/L)
Second Quarter 2016

P:\GIS\Lockheed_S2_Q2Q316\Perc_Isocon.mxd



LEGEND

- Well Location with Perchlorate Concentration [µg/L]
- Perchlorate Isoconcentration Contour (Dashed where inferred)
- Waste Discharge Area
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary (Lockheed Martin Beaumont Site 2)

Adapted from: July 2014 aerial photograph.

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

Results shown for sampled locations only.

[#] Bold indicates MCL value exceeded.

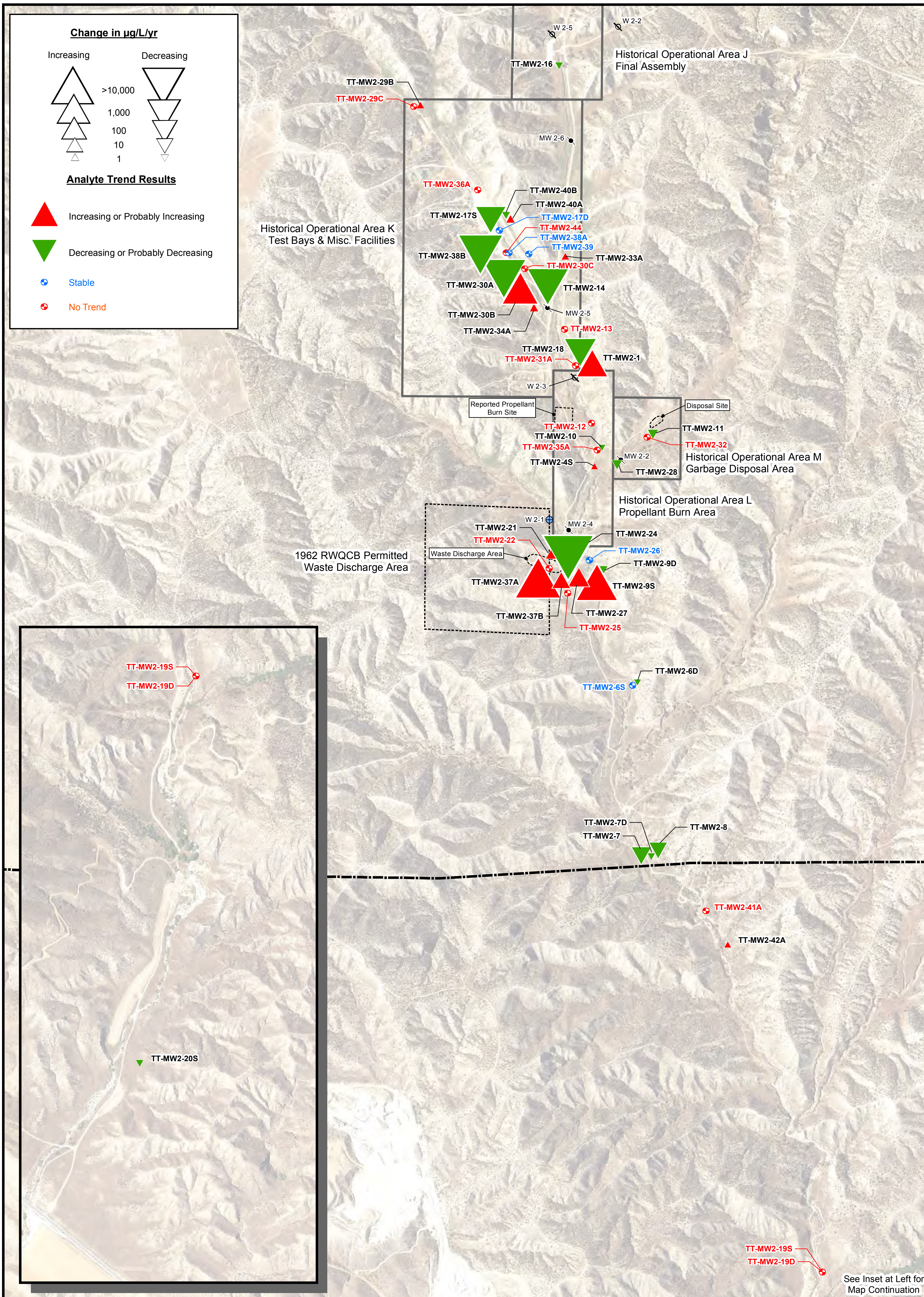
Highest concentration shown is contoured for clustered or nested well locations.

0 300 600 Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 11
Perchlorate Isoconcentration Map (µg/L)
Second Quarter 2016

Path: P:\GIS\Lockheed_S2_Q2Q316\Trend_Perc.mxd



LEGEND

Destroyed Production Well Location
Destroyed Monitoring Well Location
Reported Production Well Location

RWQCB Permitted Waste Discharge Area
Historical Operational Area Boundary
Laborde Canyon Site Boundary

Adapted from:
July 2014 aerial photograph.

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

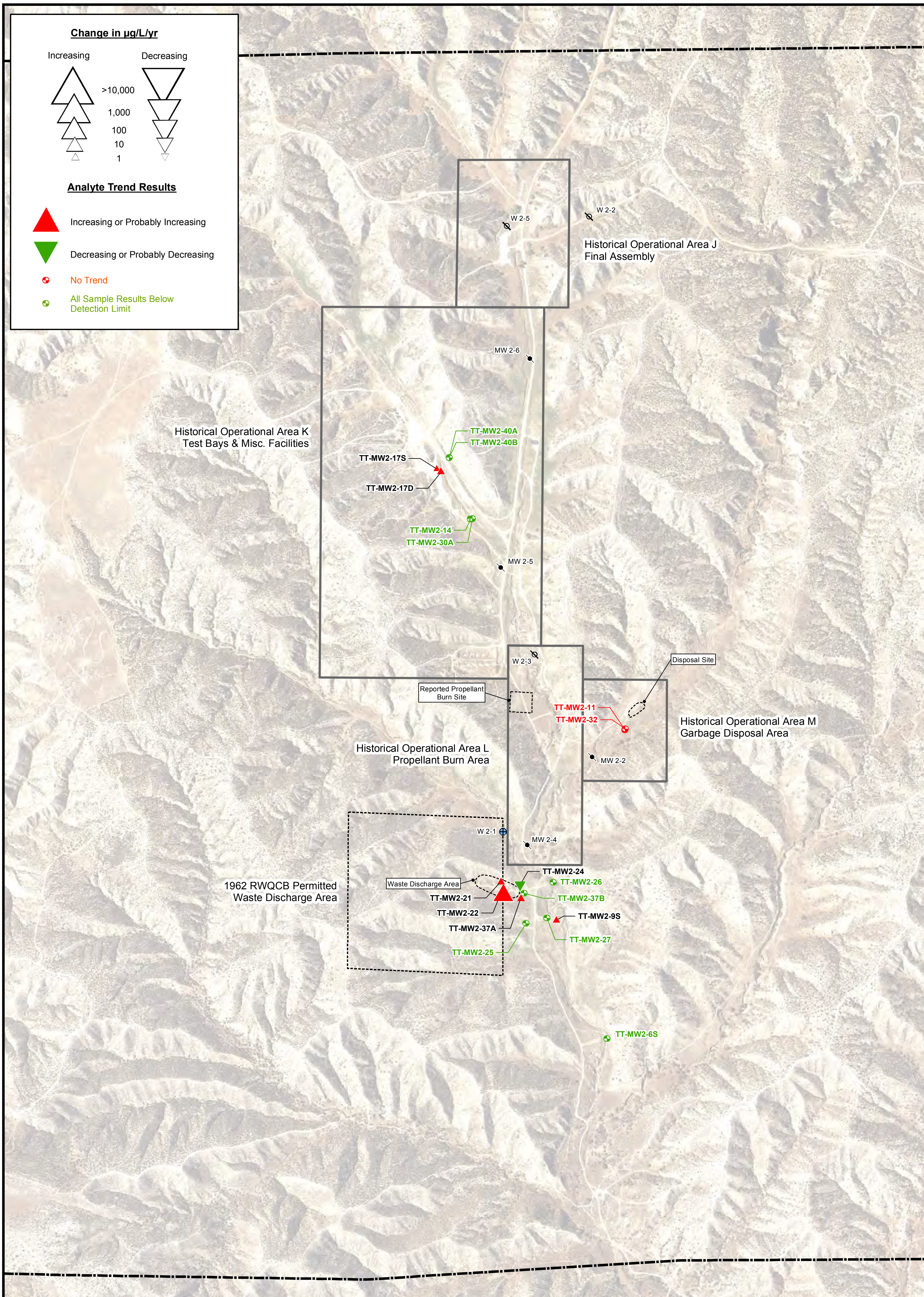
0 500 1,000
Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 12

Perchlorate Statistical Analysis Summary Results

Path: P:\GIS\Lockheed_S2_Q2Q316\Trend_TCE.mxd



LEGEND

- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Property Boundary

Adapted from:
July 2014 aerial photograph.

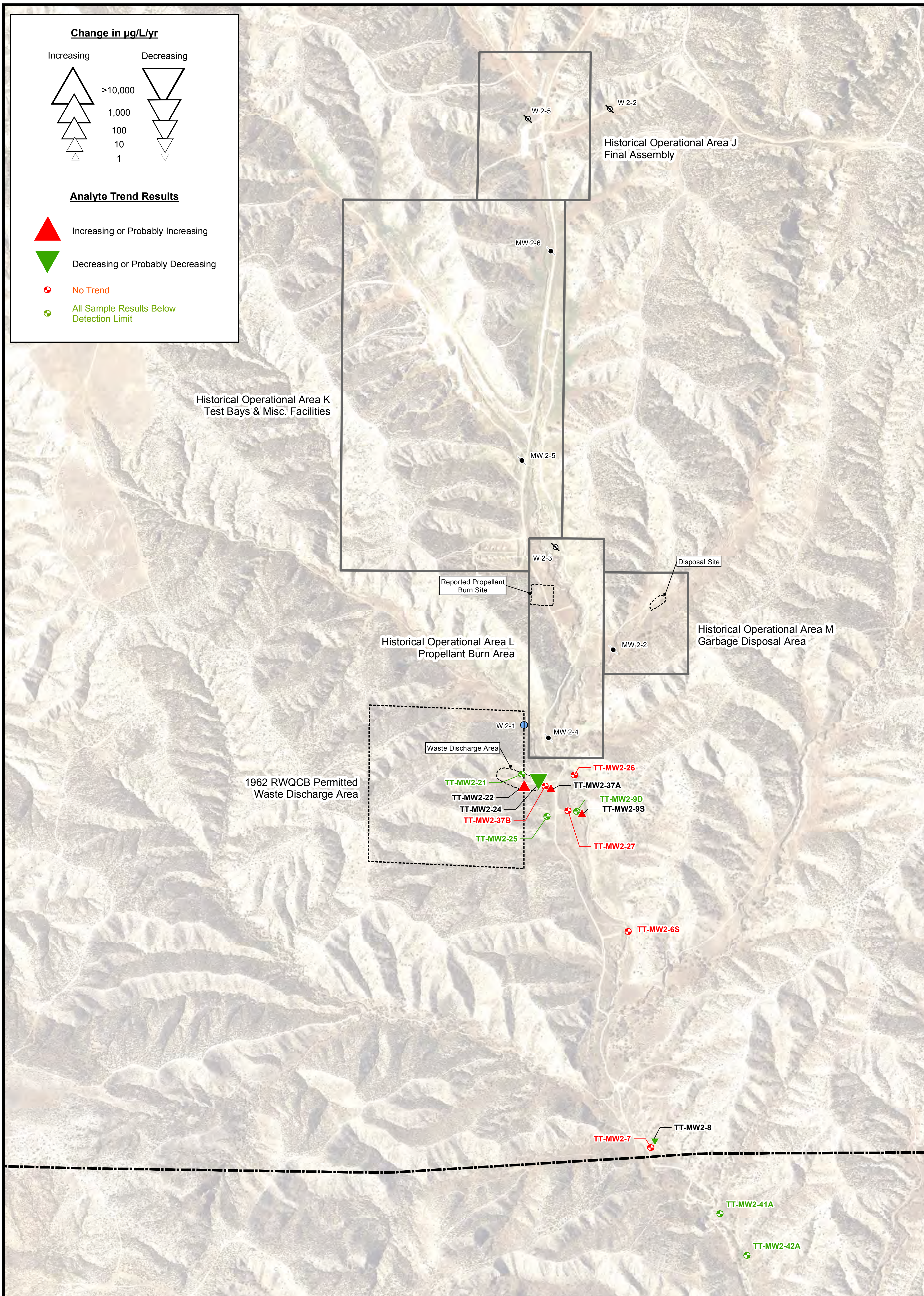
Note:
Beaumont Site 2 property boundary from Hillwig-Goodrow survey, May 2004.

0 400 800
Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 13

TCE Statistical Analysis Summary Results



Path: P:\GIS\Lockheed_S2_Q2Q316\Trend_Diox.mxd

LEGEND

- Destroyed Production Well Location
- Destroyed Monitoring Well Location
- Reported Production Well Location
- RWQCB Permitted Waste Discharge Area
- Historical Operational Area Boundary
- Laborde Canyon Site Boundary

Adapted from:
July 2014 aerial photograph.

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

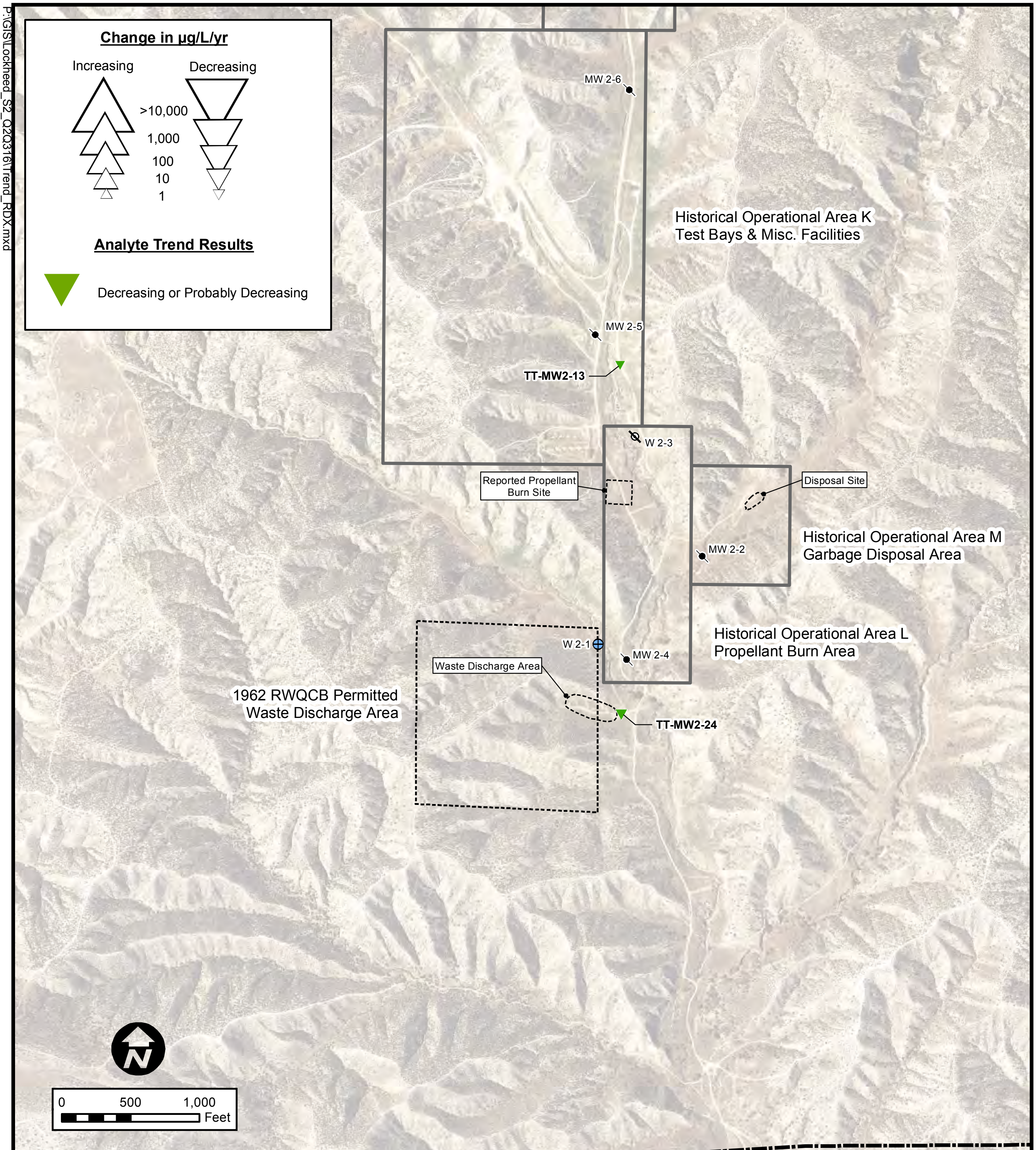
0 400 800 Feet

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 14

1,4-Dioxane Statistical Analysis Summary Results

P:\GIS\Lockheed_S2_Q2Q316\Trend_RDX.mxd



LEGEND

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

Adapted from: July 2014 aerial photograph.

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

Laborde Canyon
(Lockheed Martin Beaumont Site 2)

Figure 15

RDX Statistical Analysis Summary Results

TABLES

Table 1
Groundwater Elevation Data - Second Quarter 2016 and Third Quarter 2016

Well ID	TOC Elevation (feet msl)	Second Quarter 2015				Third Quarter 2015			
		Date Measured	Depth to Water (feet BTOC)	Groundwater Elevation (feet msl)	Elevation Change [1] (feet)	Date Measured	Depth to Water (feet BTOC)	Groundwater Elevation (feet msl)	Elevation Change[1] (feet)
TT-EW2-1	1840.24	05/10/16	24.04	1816.20	-0.10	08/22/16	26.07	1814.17	2.03
TT-EW2-2	2079.12	05/11/16	62.18	2016.94	0.21	08/22/16	62.22	2016.90	0.04
TT-EW2-3	1962.82	05/10/16	53.90	1908.92	0.01	08/22/16	54.02	1908.80	0.12
TT-MW2-1	2035.21	05/11/16	62.46	1972.75	0.01	08/22/16	62.50	1972.71	0.04
TT-MW2-2	2137.75	05/11/16	72.18	2065.57	0.13	08/22/16	72.25	2065.50	0.07
TT-MW2-3	2094.66	05/11/16	72.02	2022.64	0.22	08/22/16	72.10	2022.56	0.08
TT-MW2-4S	1986.94	05/10/16	51.84	1935.10	-0.07	08/22/16	52.34	1934.60	0.50
TT-MW2-4D	1987.17	05/10/16	60.22	1926.95	-0.01	08/22/16	60.69	1926.48	0.47
TT-MW2-5	1911.31	05/10/16	42.46	1868.85	0.24	08/22/16	42.59	1868.72	0.13
TT-MW2-6S	1908.00	05/10/16	39.81	1868.19	0.76	08/22/16	40.32	1867.68	0.51
TT-MW2-6D	1908.07	05/10/16	40.64	1867.43	0.82	08/22/16	39.57	1868.50	-1.07
TT-MW2-7	1839.25	05/10/16	24.54	1814.71	0.72	08/22/16	26.42	1812.83	1.88
TT-MW2-7D	1838.96	05/10/16	21.17	1817.79	-0.04	08/22/16	23.13	1815.83	1.96
TT-MW2-8	1836.32	05/10/16	20.75	1815.57	0.73	08/22/16	21.80	1814.52	1.05
TT-MW2-9S	1938.38	05/10/16	44.53	1893.85	0.53	08/22/16	44.11	1894.27	-0.42
TT-MW2-9D	1938.78	05/10/16	48.01	1890.77	0.84	08/22/16	47.56	1891.22	-0.45
TT-MW2-10	2001.57	05/10/16	58.50	1943.07	-0.05	08/22/16	58.67	1942.90	0.17
TT-MW2-11	2004.51	05/11/16	52.34	1952.17	0.11	08/22/16	53.36	1951.15	1.02
TT-MW2-12	2016.26	05/11/16	53.52	1962.74	0.10	08/22/16	53.86	1962.40	0.34
TT-MW2-13	2049.39	05/11/16	66.89	1982.50	-0.22	08/22/16	66.90	1982.49	0.01
TT-MW2-14	2074.78	05/11/16	68.53	2006.25	0.11	08/22/16	68.67	2006.11	0.14
TT-MW2-16	2137.20	05/11/16	65.03	2072.17	0.06	08/22/16	65.25	2071.95	0.22
TT-MW2-17S	2095.55	05/11/16	72.99	2022.56	0.57	08/22/16	73.05	2022.50	0.06
TT-MW2-17D	2095.33	05/11/16	72.64	2022.69	-0.16	08/22/16	72.68	2022.65	0.04
TT-MW2-18	2035.32	05/11/16	62.25	1973.07	0.05	08/22/16	62.32	1973.00	0.07
TT-MW2-19S	1698.18	05/10/16	47.21	1650.97	0.84	08/22/16	47.14	1651.04	-0.07
TT-MW2-19D	1698.15	05/10/16	28.80	1669.35	0.78	08/22/16	28.46	1669.69	-0.34
TT-MW2-20S	1587.10	05/10/16	39.02	1548.08	0.60	08/22/16	37.77	1549.33	-1.25
TT-MW2-20D	1587.62	05/10/16	38.25	1549.37	0.59	08/22/16	38.51	1549.11	0.26
TT-MW2-21	1978.45	05/10/16	67.72	1910.73	0.11	08/22/16	67.84	1910.61	0.12
TT-MW2-22	1975.86	05/10/16	66.22	1909.64	0.06	08/22/16	66.32	1909.54	0.10
TT-MW2-23	1995.17	05/10/16	84.39	1910.78	0.12	08/22/16	84.50	1910.67	0.11
TT-MW2-24	1964.26	05/10/16	54.92	1909.34	0.03	08/22/16	55.03	1909.23	0.11
TT-MW2-25	1966.96	05/10/16	65.92	1901.04	0.81	08/22/16	65.27	1901.69	-0.65
TT-MW2-26	1944.43	05/10/16	45.20	1899.23	-0.02	08/22/16	46.04	1898.39	0.84
TT-MW2-27	1948.27	05/10/16	56.50	1891.77	0.25	08/22/16	56.81	1891.46	0.31
TT-MW2-28	1995.65	05/11/16	64.14	1931.51	-0.50	08/22/16	65.25	1930.40	1.11
TT-MW2-29A	2147.77	05/11/16	Dry	Dry	Dry	08/22/16	Dry	Dry	Dry
TT-MW2-29B	2147.90	05/11/16	120.95	2026.95	-0.08	08/22/16	120.92	2026.98	-0.03
TT-MW2-29C	2147.83	05/11/16	127.82	2020.01	-0.12	08/22/16	127.89	2019.94	0.07
TT-MW2-30A	2074.37	05/11/16	73.61	2000.76	-0.01	08/22/16	73.70	2000.67	0.09
TT-MW2-30B	2074.41	05/11/16	75.82	1998.59	-0.11	08/22/16	75.93	1998.48	0.11
TT-MW2-30C	2074.35	05/11/16	78.02	1996.33	-0.19	08/22/16	78.14	1996.21	0.12
TT-MW2-31A	2036.11	05/11/16	63.30	1972.81	0.08	08/22/16	63.43	1972.68	0.13
TT-MW2-31B	2036.15	05/11/16	69.70	1966.45	0.06	08/22/16	69.98	1966.17	0.28
TT-MW2-32	2004.87	05/11/16	54.59	1950.28	-0.01	08/22/16	55.04	1949.83	0.45
TT-MW2-33A	2070.54	05/11/16	61.17	2009.37	-0.06	08/22/16	61.24	2009.30	0.07
TT-MW2-33B	2070.54	05/11/16	66.10	2004.44	-0.12	08/22/16	66.23	2004.31	0.13
TT-MW2-33C	2070.54	05/11/16	64.54	2006.00	-0.07	08/22/16	64.66	2005.88	0.12
TT-MW2-34A	2066.84	05/11/16	68.48	1998.36	0.15	08/22/16	68.54	1998.30	0.06
TT-MW2-34B	2066.85	05/11/16	74.42	1992.43	0.00	08/22/16	74.53	1992.32	0.11
TT-MW2-34C	2066.84	05/11/16	76.24	1990.60	-0.03	08/22/16	76.35	1990.49	0.11
TT-MW2-35A	2003.20	05/10/16	53.31	1949.89	0.16	08/22/16	53.79	1949.41	0.48
TT-MW2-35B	2003.20	05/10/16	58.37	1944.83	0.05	08/22/16	58.65	1944.55	0.28
TT-MW2-36A	2100.99	05/11/16	81.10	2019.89	0.08	08/22/16	81.16	2019.83	0.06
TT-MW2-36B	2101.04	05/11/16	81.74	2019.30	0.04	08/22/16	81.84	2019.20	0.10
TT-MW2-36C	2100.88	05/11/16	81.85	2019.03	0.00	08/22/16	81.97	2018.91	0.12
TT-MW2-37A	1963.62	05/10/16	66.16	1897.46	0.06	08/22/16	66.38	1897.24	0.22
TT-MW2-37B	1963.67	05/10/16	74.39	1889.28	0.07	08/22/16	74.63	1889.04	0.24
TT-MW2-38A	2084.56	05/10/16	61.84	2022.72	0.14	08/22/16	61.94	2022.62	0.10
TT-MW2-38B	2084.42	05/10/16	82.20	2002.22	0.03	08/22/16	82.24	2002.18	0.04
TT-MW2-39	2079.53	05/11/16	62.97	2016.56	0.21	08/22/16	63.03	2016.50	0.06
TT-MW2-40A	2096.28	05/11/16	74.22	2022.06	0.15	08/22/16	74.30	2021.98	0.08
TT-MW2-40B	2096.24	05/11/16	85.12	2011.12	-0.03	08/22/16	85.26	2010.98	0.14

Table 1
Groundwater Elevation Data - Second Quarter 2016 and Third Quarter 2016

Well ID	TOC Elevation (feet msl)	Second Quarter 2015				Third Quarter 2015			
		Date Measured	Depth to Water (feet BTOC)	Groundwater Elevation (feet msl)	Elevation Change [1] (feet)	Date Measured	Depth to Water (feet BTOC)	Groundwater Elevation (feet msl)	Elevation Change[1] (feet)
TT-MW2-40C	2096.28	05/11/16	89.81	2006.47	-0.08	08/22/16	89.94	2006.34	0.13
Tt-MW2-41A	1812.47	05/10/16	26.37	1786.10	1.04	08/22/16	27.50	1784.97	1.13
Tt-MW2-41B	1812.22	05/10/16	23.48	1788.74	1.36	08/22/16	24.17	1788.05	0.69
Tt-MW2-42A	1799.06	05/10/16	30.23	1768.83	1.62	08/22/16	31.81	1767.25	1.58
Tt-MW2-42B	1799.07	05/10/16	27.92	1771.15	1.28	08/22/16	29.30	1769.77	1.38
Tt-MW2-43	1771.44	05/10/16	Dry	Dry	Dry	08/22/16	Dry	Dry	Dry
Tt-MW2-44	2085.22	05/11/16	62.61	2022.61	-0.02	08/22/16	62.75	2022.47	0.14
TT-PZ2-1	1847.06	05/10/16	27.75	1819.31	0.77	08/22/16	27.84	1819.22	0.09
TT-PZ2-2	1840.76	05/10/16	25.06	1815.70	0.80	08/22/16	26.25	1814.51	1.19
TT-PZ2-3	2079.89	05/11/16	60.75	2019.14	0.13	08/22/16	60.84	2019.05	0.09
TT-PZ2-4	1961.49	05/10/16	53.12	1908.37	0.03	08/22/16	53.15	1908.34	0.03

Acronyms and Abreviations
BTOC: below top of well casing
NA - Not applicable
msl - Mean sea level
TOC: top of well casing
Notes
1. Positive values indicate an increase in elevations; negative values indicate a decrease in elevation

Table 2
Sampling Schedule and Analysis Method
Second Quarter 2016

Sampling Location	Sample Date	VOCs (1)	1,4-dioxane (2)	Per chlorate (3)	RDX (4)	Comments and QA/QC Samples
WS-1	NA	-	-	-	-	Spring Sample, Dry
WS-2	NA	-	-	-	-	Spring Sample, Dry
WS-3	NA	-	-	-	-	Spring Sample, Dry
TT-MW2-1	6/10/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-4S	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-5	NA	-	-	-	-	Sample with Dedicated Pump, Unsufficient water to sample
TT-MW2-6S	7/15/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-6D	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-7	6/9/2016	-	X	X	-	Sample with Dedicated Pump, Duplicate TT-MW2-7-FD-16Q2
TT-MW2-7D	6/13/2016	-	-	X	-	Sample with Dedicated Pump, MS/MSD sample
TT-MW2-8	6/9/2016	-	X	X	-	Sample with Dedicated Pump
TT-MW2-9S	6/10/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-9D	6/10/2016	-	X	X	-	Sample with Dedicated Pump
TT-MW2-10	6/10/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-11	6/10/2016	X	-	X	-	Sample with Dedicated Pump, Duplicate TT-MW2-11-FD-16Q2
TT-MW2-12	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-13	6/16/2016	-	-	X	X	Sample with Dedicated Pump, RDX Duplicate TT-MW2-13-FD-16Q2
TT-MW2-14	6/8/2016	X	-	X	-	Sample with Dedicated Pump,
TT-MW2-16	6/10/2016	-	-	X	-	Sample with Dedicated Pump, Duplicate TT-MW2-16-FD-16Q2
TT-MW2-17S	6/9/2016	X	-	X	-	Sample with Dedicated Pump
TT-MW2-17D	6/9/2016	X	-	X	-	Sample with Dedicated Pump
TT-MW2-18	6/10/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW-19S	6/13/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW-19D	6/13/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW-20S	6/13/2016	-	-	X	-	Sample with Dedicated Pump, MS/MSD sample
TT-MW2-21	6/10/2016	X	X	X	-	Sample with Dedicated Pump, Duplicate TT-MW2-21-FD-16Q2
TT-MW2-22	6/10/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-24	6/16/2016	X	X	X	X	Sample with Dedicated Pump
TT-MW2-25	6/10/2016	X	X	X	-	Sample with Dedicated Pump, MS/MSD sample
TT-MW2-26	6/10/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-27	6/10/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-28	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-29B	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-29C	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-30A	6/8/2016	X	-	X	-	Sample with Dedicated Pump
TT-MW2-30B	6/8/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-30C	6/8/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-31A	6/10/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-32	6/10/2016	X	-	X	-	Sample with Dedicated Pump
TT-MW2-33A	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-34A	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-35A	6/10/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-36A	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-37A	6/10/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-37B	6/10/2016	X	X	X	-	Sample with Dedicated Pump
TT-MW2-38A	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-38B	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-39	6/9/2016	-	-	X	-	Sample with Dedicated Pump, Duplicate TT-MW2-39-FD-16Q2
TT-MW2-40A	6/9/2016	X	-	X	-	Sample with Dedicated Pump
TT-MW2-40B	6/9/2016	X	-	X	-	Sample with Dedicated Pump
TT-MW2-41A	6/13/2016	-	X	X	-	Sample with Dedicated Pump
TT-MW2-44	6/9/2016	-	-	X	-	Sample with Dedicated Pump
TT-MW2-29A	NA	-	-	-	-	Sample with Portable Pump
TT-MW2-42A	6/13/2016	-	X	X	-	Sample with Portable Pump
Total Sampling Locations:		54				
Total Samples Collected:		49				

Notes:

(shaded)	Well not sampled or surface water sample not collected
"-"	Not analyzed
EPA -	United States Environmental Protection Agency
QA/QC -	Quality assurance / quality control
MS / MSD -	Matrix Spike / Matrix Spike Duplicate
NA -	Not available
VOCs -	Volatile organic compounds
(1) -	Volatile organic compounds (VOC) analyzed by EPA Methods SW8260B
(2) -	1,4 - Dioxane analyzed by EPA Method SW8270C SIM
(3) -	Perchlorate analyzed by EPA Method E331.0, E332.0, or SW6850
(4) -	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) EPA Method 8330A

Table 3
2016 Water Quality Monitoring Locations and Sampling Frequency

Monitoring Well	2016 Well Classification	Proposed 1st Quarter 2016 to 4th Quarter 2016 Monitoring Program																		
		VOCs (SW8260B or E524.2)				Perchlorate (E331.0, E332.0, or SW6850)					1,4-Dioxane (SW8270C SIM)				RDX (SW8330A)					
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	Bi	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q		
Surface Water Locations																				
WS-1	-						●		●											
WS-2	-						●		●											
WS-3	-						●		●											
Storm Water Locations																				
SW-01	-					●														
SW-02	-					●														
SW-03	-					●														
SW-04	-					●														
SW-05	-					●														
SW-06	-					●														
SW-07	-					●														
Private Production Wells and Springs																				
PPW1	-	●				●					●									
PPW2	-	●				●					●									
PPW3	-	●				●					●									
PPW4	-	●				●					●									
PPW5	-	●				●					●									
PPW6	-	●				●					●									
PPW7	-	●				●					●									
PPW8	-	●				●					●									
Monitoring Wells																				
TT-MW2-1	H						●													
TT-MW2-4S	H						●													
TT-MW2-5	H		●				●					●								
TT-MW2-6S	H		●				●					●								
TT-MW2-6D	V						●													
TT-MW2-7	H						●					●								
TT-MW2-7D	V						●													
TT-MW2-8	H						●					●								
TT-MW2-9S	H/I		●		●		●		●			●		●						
TT-MW2-9D	V						●					●								
TT-MW2-10	H						●													
TT-MW2-11	H		●				●													
TT-MW2-12	H						●													
TT-MW2-13	H						●									●				
TT-MW2-14	H		●				●													
TT-MW2-16	B									●										
TT-MW2-17S	H		●				●													
TT-MW2-17D	V		●				●													
TT-MW2-18	V						●													
TT-MW-19S	H						●													
TT-MW-19D	V						●													
TT-MW-20S	G						●		●											
TT-MW2-21	H/I		●		●		●		●			●								
TT-MW2-22	H		●				●					●								
TT-MW2-24	H		●				●					●				●				
TT-MW2-25	H		●				●					●								
TT-MW2-26	H		●				●					●								
TT-MW2-27	H		●				●					●								
TT-MW2-28	H						●													
TT-MW2-29A	B									●										
TT-MW2-29B	B									●										
TT-MW2-29C	B									●										
TT-MW2-30A	V		●				●													
TT-MW2-30B	V/I						●		●											
TT-MW2-30C	V						●													
TT-MW2-31A	V						●													
TT-MW2-32	V		●				●													
TT-MW2-33A	H						●													
TT-MW2-34A	H/I						●		●											
TT-MW2-35A	V						●													
TT-MW2-36A	H						●													

Table 3
2016 Water Quality Monitoring Locations and Sampling Frequency

Monitoring Well	2016 Well Classification	Proposed 1st Quarter 2016 to 4th Quarter 2016 Monitoring Program																
		VOCs (SW8260B or E524.2)				Perchlorate (E331.0, E332.0, or SW6850)					1,4-Dioxane (SW8270C SIM)				RDX (SW8330A)			
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	Bi	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
TT-MW2-37A	H/I		●		●		●		●			●		●				
TT-MW2-37B	V/I		●				●		●			●						
TT-MW2-38A	H						●											
TT-MW2-38B	V						●											
TT-MW2-39	H						●											
TT-MW2-40A	H/I		●				●		●									
TT-MW2-40B	V		●				●											
TT-MW2-41A	H						●					●						
TT-MW2-42A	G						●		●			●						
TT-MW2-44	H						●											
Monitoring Wells (Not Sampled)																		
TT-MW2-2	R																	
TT-MW2-3	R																	
TT-MW2-4D	R																	
TT-MW-20D	R																	
TT-MW2-23	R																	
TT-MW2-31B	R																	
TT-MW2-33B	R																	
TT-MW2-33C	R																	
TT-MW2-34B	R																	
TT-MW2-34C	R																	
TT-MW2-35B	R																	
TT-MW2-36B	R																	
TT-MW2-36C	R																	
TT-MW2-40C	R																	
TT-MW2-43	R																	
Piezometers (Not Sampled)																		
TT-MW2-41B	-																	
TT-MW2-42B	-																	
TT-PZ2-1	-																	
TT-PZ2-2	-																	
TT-PZ2-3	-																	
TT-PZ2-4	-																	
Extraction Wells (Not Sampled)																		
TT-EW2-1	-																	
TT-EW2-2	-																	
TT-EW2-3	-																	
TT-EW2-4	-																	
Totals	-	8	19	0	3	15	50	0	12	4	8	16	0	2	0	2	0	0
		30				81					26				2			

Notes

VOCs: Volatile organic compounds

RDX: Hexahydro-1,3,5-trinitro-1,3,5-triazine

Bi: Biennial (sampled in even numbered years)

B: Background well

G: Guard well

H: Horizontal extent well

I: Increasing contaminant trend well

R: Redundant well

V: Vertical distribution well

Table 4
Groundwater Elevation Change
Second Quarter 2016 and Third Quarter 2016

Site Area	Range of Groundwater Elevation Change - Second Quarter 2016		Average Change By Area (feet)	Range of Groundwater Elevation Change - Third Quarter 2016		Average Change By Area (feet)
	Minimum	Maximum		Minimum	Maximum	
J	0.09	0.20	0.15	0.05	0.05	0.05
K	0.00	0.22	0.11	-0.03	0.20	0.07
L	0.07	0.35	0.21	-0.16	0.12	-0.02
M	0.27	0.88	0.52	-0.48	-0.09	-0.22
WDA	0.05	0.26	0.14	-0.05	0.14	0.05
LC	-1.19	0.59	0.02	-1.39	0.25	-0.58
WS	-0.57	0.94	0.25	-0.19	0.02	-0.11

Notes

J: Final Assembly Area

K: Former Test Bay Area

L: Former Burn Area

M: Garbage disposal Area

WDA: Waste discharge area

LC: Lower Canyon

RCA: Western Riverside County Regional Conservation Authority Property

Table 5
Summary of Horizontal and Vertical Groundwater Gradients - Second Quarter 2016 and Third Quarter 2016

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

	Overall	**Overall**
	STF	QAL/WSTF
	TT-MW2-2	**TT-MW2-16**
	to	to
	TT-MW2-6D	**TT-MW2-6S**
First Quarter (February 2016)	0.029	0.030
Second Quarter (February 2016)	0.029	0.030
Third Quarter (February 2016)	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**	**RCA Property**	**RCA Property**
deep screen	**TT-MW2-2** (STF)	**TT-MW2-17D** (wWSTF)	**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** (wSTF)	**TT-MW2-17S** (wSTF)	**TT-MW2-1** (wSTF)	**TT-MW2-4S** (STF)	**TT-MW2-9S** (wWSTF)	**TT-MW2-6S** (wWSTF)	**TT-MW2-7** (wWSTF)	**TT-MW2-19S** (wMEF)	**TT-MW2-20S** (wMEF)
First Quarter (February 2016)	-0.14	-0.02	0.01	-0.32	-0.12	-0.040	0.06	0.17	0.033
Second Quarter (February 2016)	-0.14	0.01	0.01	-0.33	-0.13	-0.044	0.08	0.17	0.033
Third Quarter (February 2016)	-0.14	0.01	0.01	-0.32	-0.13	0.049	0.08	0.17	-0.006

Notes

Area J - Final Assembly Area
Area K - Former Test Bay Area
Area L - Former Burn Area
RCA Property - Western Riverside County Regional Conservation Authority Property
QAL - Quaternary Alluvium
STF - San Timoteo formation
MEF - Mt. Eden formation
wSTF - Weathered San Timoteo formation
wMEF - Weathered Mt. Eden formation

Table 6
Summary of Validated Detected Organic and Inorganic Analytes
Second Quarter 2016

Sampling Location	Sample Date	Perchlorate	1,4-Dioxane	Bromodichloromethane	Bromoform	Carbon Tetrachloride	Chloroform	Chloromethane	Dibromochloromethane	1,1-Dichloroethane	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	RDX
All results reported in µg/L unless otherwise stated															
TT-MW2-01	6/10/16	**6,850**	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-04S	6/10/16	0.538	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-06S	7/15/16	**700**	0.380 Jq	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-06D	6/10/16	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-07	6/10/16	**57.2**	<0.250	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-07D	6/13/16	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-08	6/10/16	**56.5**	<0.250	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-09S	6/10/16	**7,710**	**19.50**	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.870 Jq	--
TT-MW2-09D	6/10/16	0.120 Jq	<0.250	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-10	6/10/16	2.36	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-11	6/10/16	**179**	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	2.85	--
TT-MW2-12	6/10/16	0.132 Jq	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-13	6/16/16	**4,450**	--	--	--	--	--	--	--	--	--	--	--	--	**0.38 J**
TT-MW2-14	6/9/16	**20,100**	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-16	6/10/16	1.83	--												--
TT-MW2-17S	6/9/16	**676**	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	0.590 Jq	--
TT-MW2-17D	6/9/16	**26,100**	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	**6.92**	--
TT-MW2-18	6/10/16	**4,500**	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-19S	6/13/16	2.37	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-19D	6/13/16	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-20S	6/13/16	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-21	6/10/16	2.52	<0.250	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	4.76	--
TT-MW2-22	6/10/16	0.345 Jq	**78.6**	<0.500	<2.50	<0.500	1.77	<1.50	<0.500	3.7	**1.35**	**15**	**15.6**	**424**	--
TT-MW2-24	6/16/16	**84,300**	**105**	**164**	**42.5**	**1.12**	**805**	42.3	**76.1**	1.36	**1.18**	<0.500	<0.500	**16.1**	0.20 J
TT-MW2-25	6/10/16	<0.100	<0.250	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-26	6/10/16	3.16	<0.250	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-27	6/10/16	**174**	0.950 Jq	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-28	6/10/16	0.108 Jq	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-29B	6/9/16	1.02	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-29C	6/9/16	0.585	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-30A	6/9/16	**74.4**	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-30B	6/9/16	**5,000**	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-30C	6/9/16	0.162 Jq	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-31A	6/10/16	<0.100	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-32	6/10/16	<0.100	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-33A	6/9/16	1.33 Jf	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-34A	6/9/16	5.41	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-35A	6/10/16	0.193 Jq	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-36A	6/9/16	0.115 Jq	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-37A	6/10/16	**9,380**	**22.4**	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	**5.85**	--
TT-MW2-37B	6/10/16	0.920	0.670 Jq	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-38A	6/9/16	**77,100**	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-38B	6/9/16	**296**	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-39	6/9/16	**97,900**	--	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-40A	6/9/16	1.24	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-40B	6/9/16	0.403 Jq	--	<0.500	<2.50	<0.500	<0.500	<1.50	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	--
TT-MW2-41A	6/13/16	<0.100	<0.250	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-42A	6/13/16	0.255 Jq	<0.250	--	--	--	--	--	--	--	--	--	--	--	--
TT-MW2-44	6/9/16	**21,200**	--	--	--	--	--	--	--	--	--	--	--	--	--
Method Detection Limit		0.100	0.250	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.200
MCL (unless noted) / DWNL		6	1 (1)	80 (2)	80 (2)	0.5	80 (2)	NA	5	5	0.5	6	6	5	0.3 (1)

Notes: Only analytes positively detected in samples are presented in this table.
For a complete list of constituents analyzed, refer to the laboratory data packages in Appendix H.
Bold indicates concentration exceeding MCL or DWNL
Highlighted data indicates anomalous data

µg/L - Micrograms per liter
MCL - State Water Resources Control Board Division of Drinking Water maximum contaminant level
DWNL - State Water Resources Control Board Division of Drinking Water drinking water notification level
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine
"--" Not analyzed
NA - Not available (MCL/DWNL not established).
< # - Analyte not detected, method detection limit concentration is shown.
(1) - DWNL
(2) - MCL is the sum of bromoform, chloroform, bromodichloromethane, and dibromochloromethane
J - The analyte was positively identified, but the concentration is an estimated value
q - The analyte detection was below the Practical Quantitation Limit (PQL)

Table 7
Summary Statistics for Validated Detected Organic and Inorganic Analytes
Second Quarter 2016

Organic Analytes Detected	Total Number of Samples Analyzed	Total Number of Detections (1)	Number of Detections Exceeding MCL or DWNL (1)	MCL/DWNL		Minimum Concentration Detected		Maximum Concentration Detected	
1,4-Dioxane	15	7	4	1 (2)	µg/L	0.380 Jq	µg/L	105	µg/L
Bromodichloromethane	18	1	-	-	µg/L	164	µg/L	164	µg/L
Bromoform	18	1	-	-	µg/L	42.5	µg/L	42.5	µg/L
Carbon Tetrachloride	18	1	1	0.5	µg/L	1.12	µg/L	1.12	µg/L
Chloroform	18	2	-	-	µg/L	1.770	µg/L	805	µg/L
Chloromethane	18	1	-	-	µg/L	42.3	µg/L	42.3	µg/L
Dibromochloromethane	18	1	1	5	µg/L	76.1	µg/L	76.1	µg/L
1,1-Dichloroethane	18	2	0	5	µg/L	1.36	µg/L	3.7	µg/L
1,2-Dichloroethane	18	2	2	0.5	µg/L	1.18	µg/L	1.35	µg/L
1,1-Dichloroethene	18	1	1	6	µg/L	15.00	µg/L	15.00	µg/L
cis-1,2-Dichloroethene	18	1	1	6	µg/L	15.6	µg/L	15.6	µg/L
Trichloroethene (TCE)	18	8	4	5	µg/L	0.59	µg/L	424	µg/L
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2	2	1	0.3 (2)	µg/L	0.20 J	µg/L	0.38	µg/L
Inorganic Analytes Detected	**Total Number of Samples Analyzed**	**Total Number of Detections (1)**	**Number of Detections Exceeding MCL or DWNL (1)**	**MCL/DWNL**		**Minimum Concentration Detected**		**Maximum Concentration Detected**	
Perchlorate	49	39	19	6	µg/L	0.108	µg/L	97,900	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.

MCL - State Water Resources Control Board Division of Drinking Water maximum contaminant level(On 1 July 2014, responsibility for the Drinking Water Program was transferred from the California Department of Public Health to the State Water Resources Control Board.)

DWNL - State Water Resources Control Board Division of Drinking Water drinking water notification level (On 1 July 2014, responsibility for the Drinking Water Program was transferred from the California Department of Public Health to the State Water Resources Control Board.)

" - " MCL/DWNL not established.

(1) - Number of detections exclude sample duplicates, trip blanks, and equipment blanks.

(2) - DWNL.

µg/L - Micrograms per liter.

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

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

Table 8
Groundwater Chemicals of Potential Concern

Analyte	Classification
Perchlorate	Primary
Trichloroethene	Primary
1,4-Dioxane	Primary
Benzene	Secondary
1, 2-Dichloroethane	Secondary
1, 1-Dichloroethene	Secondary
cis-1,2-dichloroethene	Secondary
RDX	Secondary

Note:
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine

Table 9
Mann-Kendall Concentration Trend Matrix

Mann-Kendall Statistic (S)	Confidence in Trend	Concentration Trend
S > 0	> 95%	Increasing
S > 0	90 - 95%	Probably Increasing
S > 0	< 90%	No Trend
S ≤ 0	< 90% and COV ≥1	No Trend
S ≤ 0	< 90% and COV < 1	Stable
S < 0	90 - 95%	Probably Decreasing
S < 0	> 95%	Decreasing
ND	-	Non-detect
NA	-	Not applicable

Notes

> - Greater than
≥ - Greater than or equal to 1
< - Less than
≤ - Less than or equal to
COV - Coefficient of Variation
ND - All results non-detect
NA - Not applicable, less than four quarters of data

Table 10
Summary of Mann-Kendall Trend Analysis of Chemicals of Potential Concern for 2016 Sampled Monitoring Wells

Analyte	Locations Tested	Insufficient Data	No Trend	Non Detect	Decreasing Trend	Probably Decreasing Trend	Stable Trend	Probably Increasing Trend	Increasing Trend
Trichloroethene	18	0	2	9	0	1	0	0	6
Perchlorate	49	0	14	0	16	1	5	3	10
1,4-Dioxane	15	0	5	5	2	0	0	0	3
RDX	2	0	0	0	2	0	0	0	0
Total Analysis	84	0	21	14	20	2	5	3	19

Notes
RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine

Table 11
Summary of Mann-Kendall Trend Analysis of Chemicals of Potential Concern for 2016 Sampled Surface Water Locations

Analyte	Locations Tested	Insufficient Data	No Trend	Non Detect	Decreasing Trend	Probably Decreasing Trend	Stable Trend	Probably Increasing Trend	Increasing Trend
Trichloroethene	1	0	0	1	0	0	0	0	0
Perchlorate	1	0	1	0	0	0	0	0	1
1,4-Dioxane	1	1	0	0	0	0	0	0	0
RDX	0	0	0	0	0	0	0	0	0
Total Analysis	3	1	1	1	0	0	0	0	1

Notes

RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine

Table 12
Magnitude of Trends Detected for Chemicals of Potential Concern for 2016 Sampled Monitoring Wells

Analyte	Decreasing Trend		Probably Decreasing Trend		Probably Increasing Trend				Increasing Trend			
	Number	Magnitude (µg/L/yr)	Number	Magnitude (µg/L/yr)	Number	Location	Magnitude (µg/L/yr)	Magnitude (%/yr)	Number	Location	Magnitude (µg/L/yr)	Magnitude (%/yr)
Trichloroethene	0		1	-4.19	0				6	TT-MW2-9S	0.16	15.7
										TT-MW2-17S	0.03	8.94
										TT-MW2-17D	0.38	13.1
										TT-MW2-21	0.45	15.0
										TT-MW2-22	26	7.30
										TT-MW2-37A	0.64	20
Perchlorate	16	-4,271 to -0.01	1	-3.27	3	TT-MW2-29B	0.06	13.0	10	TT-MW2-1	384	4.93
						TT-MW2-40A	1.23	29		TT-MW2-4S	0.03	4.93
						TT-MW2-42A	0.02	9.86		TT-MW2-9S	1,967	26
										TT-MW2-21	2.41	22
										TT-MW2-27	41	13.3
										TT-MW2-30B	913	18.3
										TT-MW2-33A	0.08	14.8
										TT-MW2-34A	1.53	27
										TT-MW2-37A	2,738	27
										TT-MW2-37B	10.6	18.3
1,4-Dioxane	2	-10.1 to -0.16	0		0				3	TT-MW2-9S	1.31	8.76
										TT-MW2-22	5.26	8.21
										TT-MW2-37A	1.48	9.86
RDX	2	-0.33 to -0.02	0		0				0			

Notes

RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine

µg/L/yr - Micrograms per liter per year

%/yr - Percent change per year

Table 13
Historical Trichloroethene Trend Summary in Monitoring Wells

	Locations Tested										
Trend Category	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
"N/A"-Insufficient Data	3	0	6	31	0	0	0	0	0	0	0
"ND" - Non Detect (new designation)	--	--	--	--	50	11	11	10	9	9	9
"NT" - No Trend	1	1	2	1	5	2	2	2	1	2	2
"S" - Stable	4	20	16	24	0	1	0	0	0	1	0
"I" - Increasing	0	0	1	1	4	6	6	6	6	6	6
"PI" -Probably Increasing	0	0	0	1	0	0	0	0	1	0	0
"D" - Decreasing	0	0	0	0	0	0	0	1	1	0	0
"PD" -Probably Decreasing	0	0	0	0	0	0	1	0	0	0	1
Total Locations Tested	8	21	25	58	59	20	20	19	18	18	18

Notes

-- ND (non-detect) was not a category designation prior to the 2011 statistics

Table 14
Historical Perchlorate Trend Summary in Monitoring Wells

	Locations Tested										
Trend Category	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
"N/A"-Insufficient Data	3	0	6	30	2	0	0	0	0	0	0
"ND" - Non Detect (new designation)	--	--	--	--	7	3	3	3	3	1	0
"NT" - No Trend	5	5	2	12	31	18	15	13	14	16	14
"S" - Stable	0	8	7	11	10	6	4	2	2	4	5
"I" - Increasing	0	4	5	3	7	8	12	10	10	10	10
"PI" -Probably Increasing	0	0	1	1	1	4	0	2	2	1	3
"D" - Decreasing	0	4	3	3	5	8	16	11	14	14	16
"PD" -Probably Decreasing	0	0	1	1	1	3	1	7	4	0	1
Total Locations Tested	8	21	25	61	64	50	51	48	49	46	49

Notes:
-- ND (non-detect) was not a category designation prior to the 2010 statistics

Table 15
Historical 1,4-Dioxane Trend Summary in Monitoring Wells

	Locations Tested										
Trend Category	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
"N/A"-Insufficient Data	--	--	--	22	0	0	0	0	0	1	0
"ND" - Non Detect (new designation)	--	--	--	--	6	4	5	5	5	5	5
"NT" - No Trend	--	--	--	0	6	6	6	6	4	5	5
"S" - Stable	--	--	--	0	1	2	2	1	0	0	0
"I" - Increasing	--	--	--	0	0	2	3	3	3	3	3
"PI" -Probably Increasing	--	--	--	0	0	0	0	0	0	0	0
"D" - Decreasing	--	--	--	0	0	0	0	1	1	1	2
"PD" -Probably Decreasing	--	--	--	0	0	0	0	0	2	1	0
Total Locations Tested	0	0	0	22	13	14	16	16	15	16	15

Notes

-- ND (non-detect) was not a category designation prior to the 2011 statistics

Table 16
Summary of Increasing Trends for Chemicals of Potential Concern – Second Quarter 2016

Analyte:	Perchlorate				Trichloroethene				1,4-Dioxane				RDX	
Well Location	Q2 - 2016 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)	Q2 - 2016 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)	Q2 - 2016 Results (µg/L)	Trend	Magnitude (µg/L/yr)	Magnitude (%/yr)	Q2 - 2016 Results (µg/L)	Trend
Area K														
TT-MW2-1	**6,850**	Increasing	384	4.93	-	Not analyzed			-	Not analyzed	-	-	-	Not analyzed
TT-MW2-17S	**676**	Decreasing	-265	-5.29	0.590 Jq	Increasing	0.03	8.94	-	Not analyzed	-	-	-	Not analyzed
TT-MW2-17D	**26,100**	Stable			**6.92**	Increasing	0.38	13.1	-	Not analyzed	-	-	-	Not analyzed
TT-MW2-29B	1.02	Probably Increasing	0.06	13.0	-	Not analyzed	-	-	-	Not analyzed	-	-	-	Not analyzed
TT-MW2-30B	**5,000**	Increasing	913	18.3	-	Not analyzed	-	-	-	Not analyzed	-	-	-	Not analyzed
TT-MW2-33A	1.33 Jf	Increasing	0.08	14.8	-	Not analyzed	-	-	-	Not analyzed	-	-	-	Not analyzed
TT-MW2-34A	5.41	Increasing	1.53	27	-	Not analyzed	-	-	-	Not analyzed	-	-	-	Not analyzed
TT-MW2-40A	1.24	Probably Increasing	1.23	29	<0.500	Non Detect			-	Not analyzed	-	-	-	Not analyzed
Area L														
TT-MW2-4S	0.54	Increasing	0.03	4.93	-	Not analyzed	-	-	-	Not analyzed	-	-	-	Not analyzed
Former Waste Discharge Area														
TT-MW2-21	2.52	Increasing	2.41	22	4.76	Increasing	0.45	15.0	<0.250	Non Detect			-	Not analyzed
TT-MW2-22	0.345 Jq	No Trend			**424**	Increasing	26	7.30	**78.6**	Increasing	5.26	8.21	-	Not analyzed
TT-MW2-37A	**9,380**	Increasing	2,738	27	**5.85**	Increasing	0.64	20	**22.4**	Increasing	1.48	9.86	-	Not analyzed
TT-MW2-37B	0.92	Increasing	10.6	18.3	<0.500	Non Detect			0.670 Jq	No Trend			-	Not analyzed
Lower Canyon (Downgradient and Crossgradient of the Former Waste Discharge Area)														
TT-MW2-9S	**7,710**	Increasing	1,967	26	0.870 Jq	Increasing	0.16	15.7	**19.5**	Increasing	1.31	8.76	-	Not analyzed
TT-MW2-27	**174**	Increasing	41	13.3	<0.500	Non Detect			0.950 Jq	No Trend			-	Not analyzed
TT-MW2-42A	0.255 Jq	Probably Increasing	0.02	9.86	-	Not analyzed	-	-	<0.250	Non Detect			-	Not analyzed
MCL / DWNL	6.0				5.0				1 (1)				0.3 (1)	

Notes

Shading indicates locations where the magnitude of the increasing or probably increasing trend represents greater than a 20 percent change.

%/yr - Percent change per year with respect to the sample mean

µg/L/yr - Micrograms per liter per year

µg/L - Micrograms per liter

MCL - State Water Resources Control Board Division of Drinking Water maximum contaminant level

DWNL - State Water Resources Control Board Division of Drinking Water drinking water notification level

(1) - DWNL

Bold - MDL or DWNL exceeded

"-" - Not analyzed

< # - Method detection limit concentration is shown

RDX - Hexahydro-1,3,5-trinitro-1,3,5-triazine

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

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

Table 17
Current Sampling Frequencies by Well Classification

Well Classification	Approved Sampling Frequency
Horizontal Extent Wells	Annual
Vertical Distribution Wells	Annual
Increasing Contaminant Trend Wells	Semiannual
Background Wells	Biennial
Remedial Monitoring Wells	Vary, based on remedial action proposed
Guard Wells	Semiannual
New Wells	4 quarters then reclassify
Redundant Wells	Suspend (no sampling)

Table 18
2017 Water Quality Monitoring Locations and Sampling Frequency

Monitoring Well	2016 Well Classification	2017 Well Classification	Proposed 1st Quarter 2017 to 4th Quarter 2017 Monitoring Program: VOCs (SW8260B or E524.2)				Perchlorate (E331.0, E332.0, or SW6850)					1,4-Dioxane (SW8270C SIM)				RDX (SW8330A)			
			1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	Bi	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Surface Water Locations																			
WS-1	-	-						•		•									
WS-2	-	-						•		•									
WS-3	-	-						•		•									
Storm Water Locations																			
SW-01	-	-					•												
SW-02	-	-					•												
SW-03	-	-					•												
SW-04	-	-					•												
SW-05	-	-					•												
SW-06	-	-					•												
SW-07	-	-					•												
Private Production Wells and Springs																			
PPW1	-	-	•				•					•							
PPW2	-	-	•				•					•							
PPW3	-	-	•				•					•							
PPW4	-	-	•				•					•							
PPW5	-	-	•				•					•							
PPW6	-	-	•				•					•							
PPW7	-	-	•				•					•							
PPW8	-	-	•				•					•							
Monitoring Wells																			
TT-MW2-1	H	H						•											
TT-MW2-4S	H	H						•											
TT-MW2-5	H	H		•				•					•		•				
TT-MW2-6S	H	H		•				•					•		•				
TT-MW2-6D	V	V						•					•						
TT-MW2-7	H	H						•					•		•				
TT-MW2-7D	V	V						•											
TT-MW2-8	H	H						•					•		•				
TT-MW2-9S	H/I	H		•		•		•		•			•		•				
TT-MW2-9D	V	V						•					•						
TT-MW2-10	H	H						•											
TT-MW2-11	H	H		•				•											
TT-MW2-12	H	H						•											
TT-MW2-13	H	H						•									•		
TT-MW2-14	H	H		•				•											
TT-MW2-16	B	B									•								
TT-MW2-17S	H	H		•				•											
TT-MW2-17D	V	V		•				•											
TT-MW2-18	V	V						•											
TT-MW-19S	H	H						•											
TT-MW-19D	V	V						•											
TT-MW-20S	G	G						•		•									
TT-MW2-21	H/I	H/I		•		•		•		•			•						
TT-MW2-22	H	H		•				•					•						
TT-MW2-23	R	R																	
TT-MW2-24	H	H		•				•					•		•		•		
TT-MW2-25	H	H		•				•					•						
TT-MW2-26	H	H		•				•					•						
TT-MW2-27	H/I	H		•				•					•						
TT-MW2-28	H	H						•											
TT-MW2-29A	B	B									•								
TT-MW2-29B	B	B									•								
TT-MW2-29C	B	B									•								
TT-MW2-30A	V	V		•				•											
TT-MW2-30B	V/I	V						•											
TT-MW2-30C	V	V						•											
TT-MW2-31A	V	V						•											
TT-MW2-32	V	V		•				•											
TT-MW2-33A	H/I	H						•											
TT-MW2-34A	H/I	H/I						•		•									
TT-MW2-35A	V	V						•											
TT-MW2-36A	H	H						•											
TT-MW2-37A	H/I	H/I		•		•		•		•			•		•				

Table 18
2017 Water Quality Monitoring Locations and Sampling Frequency

Monitoring Well	2016 Well Classification	2017 Well Classification	Proposed 1st Quarter 2017 to 4th Quarter 2017 Monitoring Program																
			VOCs (SW8260B or E524.2)				Perchlorate (E331.0, E332.0, or SW6850)					1,4-Dioxane (SW8270C SIM)				RDX (SW8330A)			
			1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	Bi	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
TT-MW2-37B	V/I	V		●				●					●						
TT-MW2-38A	H	H						●											
TT-MW2-38B	V	V						●											
TT-MW2-39	H	H						●											
TT-MW2-40A	H/I	H/I		●				●		●									
TT-MW2-40B	V	V		●				●											
TT-MW2-41A	H	H						●					●						
TT-MW2-42A	G	G						●		●			●						
TT-MW2-44	H	H						●											
Monitoring Wells (Not Sampled)																			
TT-MW2-2	R	R																	
TT-MW2-3	R	R																	
TT-MW2-4D	R	R																	
TT-MW-20D	R	R																	
TT-MW2-31B	R	R																	
TT-MW2-33B	R	R																	
TT-MW2-33C	R	R																	
TT-MW2-34B	R	R																	
TT-MW2-34C	R	R																	
TT-MW2-35B	R	R																	
TT-MW2-36B	R	R																	
TT-MW2-36C	R	R																	
TT-MW2-40C	R	R																	
TT-MW2-43	R	R																	
Piezometers (Not Sampled)																			
TT-MW2-41B	-	-																	
TT-MW2-42B	-	-																	
TT-PZ2-1	-	-																	
TT-PZ2-2	-	-																	
TT-PZ2-3	-	-																	
TT-PZ2-4	-	-																	
Extraction Wells (Not Sampled)																			
TT-EW2-1	-	-																	
TT-EW2-2	-	-																	
TT-EW2-3	-	-																	
TT-EW2-4	-	-																	
Totals	-	-	8	19	0	3	15	50	0	10	4	8	17	0	7	0	2	0	0
			30				79					32				2			

Notes

●: Proposed analysis

Highlighting indicates change in sampling frequency

EPA - United States Environmental Protection Agency

VOCs: Volatile organic compounds

RDX: Hexahydro-1,3,5-trinitro-1,3,5-triazine

Bi: Biennial (sampled in even numbered years)

B: Background well

G: Guard well

H: Horizontal extent well

I: Increasing contaminant trend well

R: Redundant well

V: Vertical distribution well

APPENDICES
(PROVIDED ON CD)