Revised

Site 1 Well Rehabilitation, Destruction, and Well Installation Report
Lockheed Martin Corporation, Beaumont Site 1
Beaumont, California

Prepared for:

LOCKHEED MARTIN

TETRA TECH

301 E. Vanderbilt Way, Suite 450
San Bernardino, California 92408

TC# 23521-1005 / November 2010

Lockheed Martin Corporation, Shared Services
Energy, Environment, Safety and Health
2950 North Hollywood Way, Suite 125 Burbank, CA 91505
Telephone: 818.847.0197 Facsimile: 818.847.0256

LOCKHEED MARTIN

November 1, 2010

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

Subject: Submittal of Revised *Site 1 Well Rehabilitation, Destruction, and Well Installation Report, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California*

Dear Mr. Zogaib:

Please find enclosed one hard copy of the report body and two compact disks with electronic copies of the report body and appendices of the Revised *Site 1 Well Rehabilitation, Destruction, and Well Installation Report, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California*. This report has been revised per our responses to DTSC's comments submitted on September 1, 2010 and verbally approved by you on October 26, 2010. These comments and responses are included as an enclosure to this letter.

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

Sincerely,

Denise Kato

Denise Kato
Remediation Analyst Senior Staff

Enclosure 1: Revised *Site 1 Well Rehabilitation, Destruction, and Well Installation Report, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California*

Enclosure 2: DTSC August 17, 2010 Comments and LMC September 1, 2010 Responses to Comments

Copy with Enclosures 1 & 2:
Gene Matsushita, LMC (hard copy & electronic copy)
Ian Lo, CDM (electronic copy)
Tom Villeneuve, Tetra Tech, Inc. (hard copy & electronic copy)
Alan Bick, Gibson, Dunn, & Crutcher, LLP (electronic copy)

BUR237 Well Rehab & Destruction Rpt

TETRA TECH

Revised

Site 1 Well Rehabilitation, Destruction and Well Installation Report Lockheed Martin Corporation Beaumont Site 1, Beaumont, California

November 2010
T#: 23521-1005

Prepared for:
Lockheed Martin Corporation
Burbank, California

Prepared by:
Tetra Tech, Inc.

Christopher Patrick

Thomas J. Villeneuve, P.E.
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1.0 INTRODUCTION

Tetra Tech, Inc. (Tetra Tech) is pleased to submit the following Site 1 Well Rehabilitation, Destruction, and Well Installation Report (Report) for Lockheed Martin Corporation (LMC) Beaumont Site 1 (the Site), located in Beaumont, California (Figure 1).

This Report describes field activities associated with the rehabilitation and / or destruction of five groundwater monitoring wells at the Site that were either blocked, were in a physical condition that rendered them unusable, or were in danger of being damaged by advancing streambed erosion. Additionally, two new monitoring wells were installed to replace two wells in danger of being damaged from adjacent streambed erosion. All work was done in accordance with the letter work plan submitted to DTSC on October 19, 2009 and approved on October 28, 2009.

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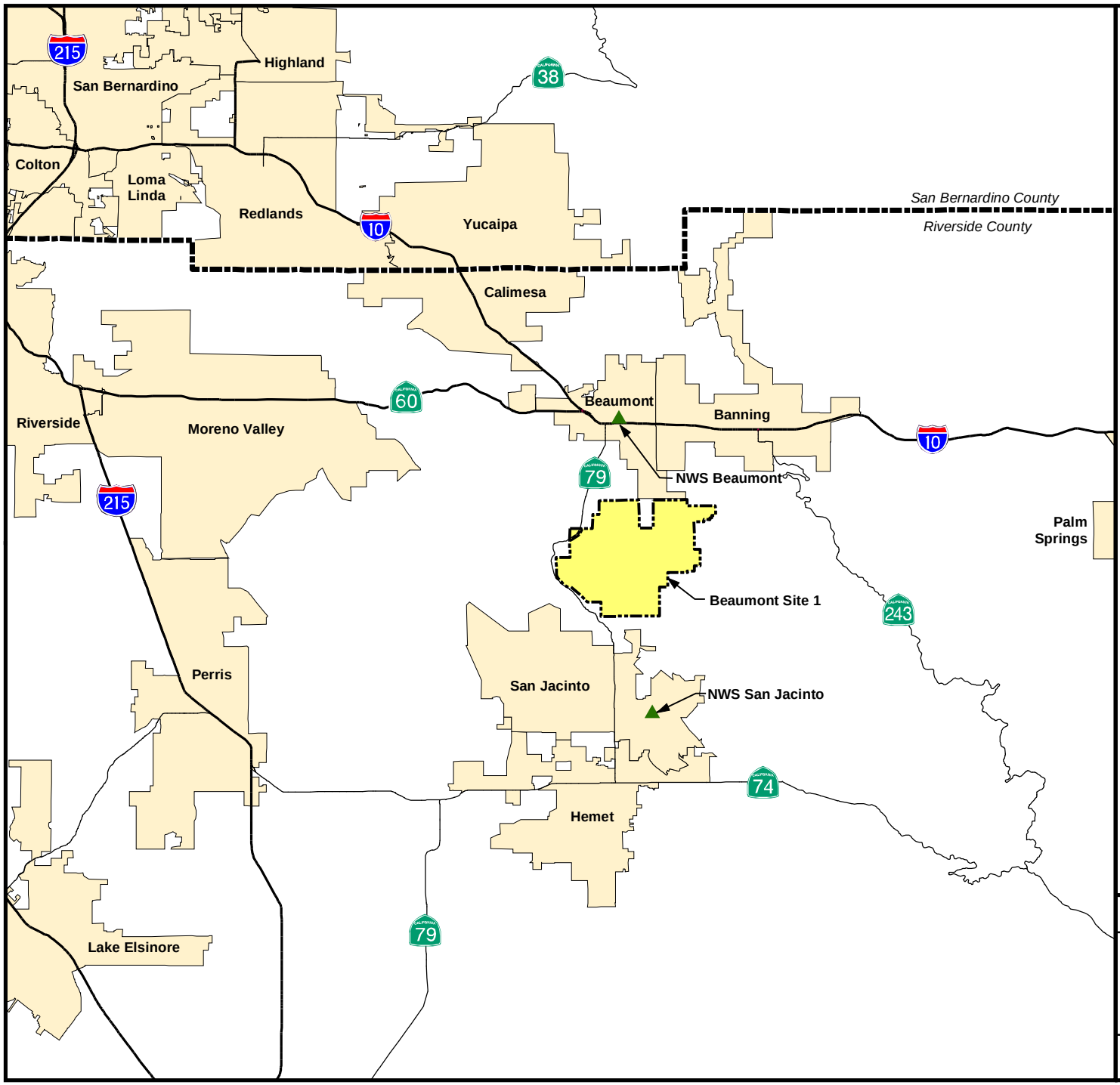

0 5 Miles

Adapted from:

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

LEGEND

- National Weather Service Station
- Interstate/Freeway
- State Highway
- County Boundary
- Beaumont Site 1 Property Boundary
- City/Municipality

Beaumont Site 1

Figure 1
Regional Location of Beaumont Site 1

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2.0 OBJECTIVES

The objectives of the activities performed under this task were as follows:

- Remove obstructions from two wells, EW-15 and MW-24, and rehabilitate the wells to useable condition. If the wells could not be rehabilitated, the wells would be destroyed in accordance with the Riverside County Environmental Health Department and the State of California well destruction procedures (California Department of Water Resources (CDWR), 1981 and 1990). No replacement wells were proposed for these wells should they require destruction;
- Destroy one well, MW-21, with a damaged well casing in accordance with the Riverside County Environmental Health Department and the State of California well destruction procedures (CDWR, 1981 and 1990). No replacement well was proposed for MW-21;
- Destroy two monitoring wells, MW-37 and MW-42, in accordance with the Riverside County Environmental Health Department and the State of California well destruction procedures (CDWR, 1981 and 1990). The wells were located near the edge of active drainages and could have become damaged if continued erosion occurs. Replacement wells were proposed for these locations;
- Install two wells to replace MW-37 and MW-42, following State of California well installation procedures (CDWR, 1981 and 1990, and California Environmental Protection Agency (Cal-EPA), 1995).

3.0 FIELD WORK

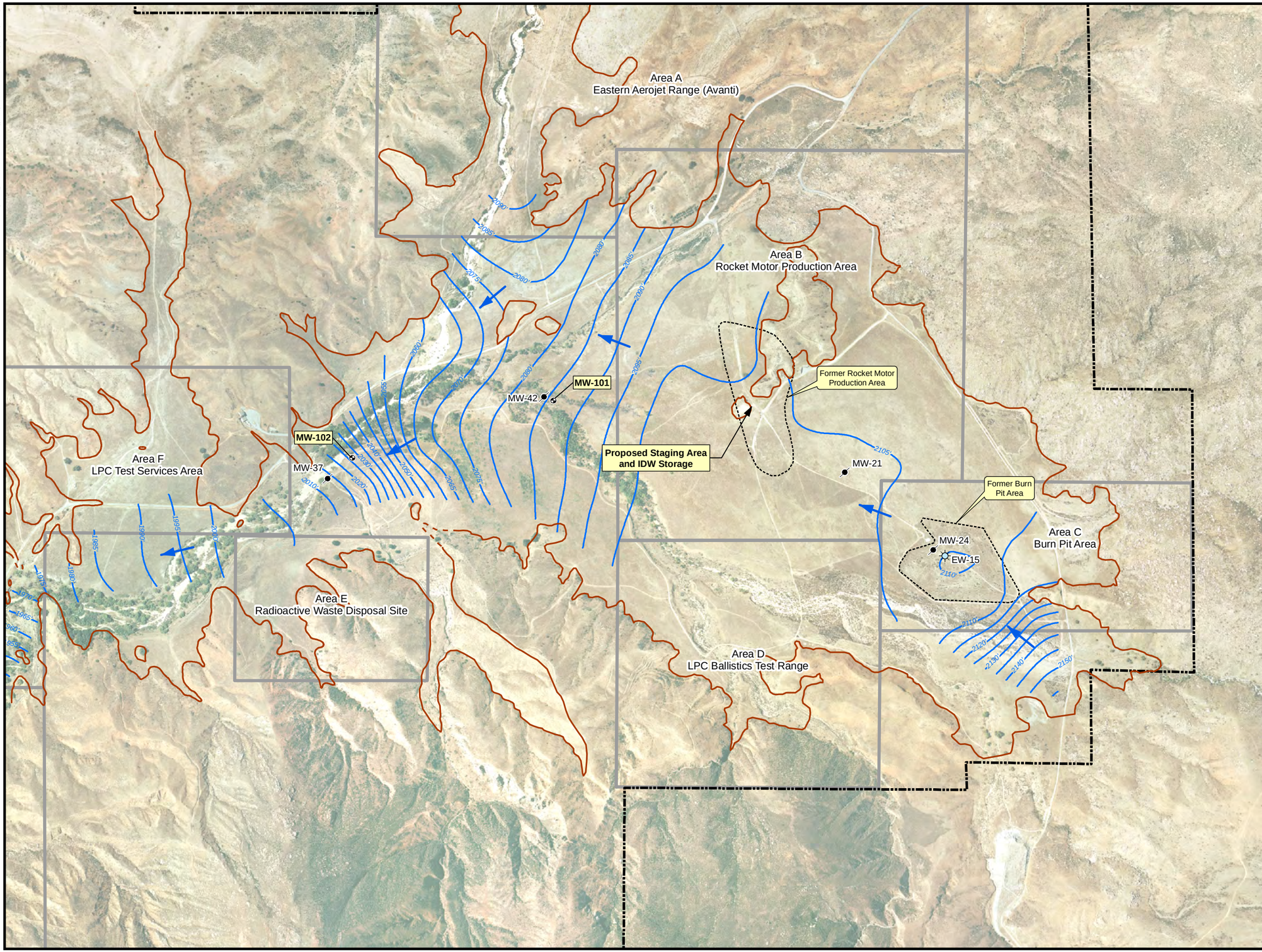
Prior to the start of field work, monitoring well destruction and installation permits were obtained from the County of Riverside Department of Environmental Health. Copies of the permits can be found in Appendix A. All field work was conducted between November 2 and November 12, 2009. The field work consisted of destroying wells MW-21, MW-24, MW-37, and MW-42, (MW-24 was destroyed following an unsuccessful attempt to rehabilitate it), rehabilitation of well EW-15 and installation of replacement wells MW-101 (replacing MW-42) and MW-102 (replacing MW-37). Figure 2 shows the locations of the wells being destroyed or rehabilitated and the replacement wells.

3.1 WELL DESTRUCTION BY PRESSURE GROUTING

Monitoring wells MW-21, MW-37, and MW-42 were destroyed by pressure grouting. MW-24 was destroyed by pressure grouting following rehabilitation activities detailed in Section 3.2.2. Following confirmation of the total depth of each well, sufficient grout was prepared to fill the well casing and the length of filter pack that was present (assuming 30 percent porosity in the filter pack). Grout was prepared by mixing not more than 7 gallons of potable water and no more than 4 pounds of powdered bentonite to every 94-pound sack of Type I/II Portland cement. Once the grout was thoroughly mixed, the grout was placed into the well using a tremie pipe. The tremie pipe was lowered to near the bottom of the well and grout was pumped into the well using the grout pump on the drill rig. Although there was concern that the damaged section of casing in MW-21 might interfere with the placement of the tremie pipe, the field crew was able to insert the tremie pipe past the damaged section of casing and lower it to the bottom of the well for grouting. The grout was placed in one continuous pour from the bottom of the well to the top. The tremie pipe was gradually removed as the grout was placed ensuring that the end of the tremie pipe was always submerged below the top of the grout during pumping operations. Once the grout was brought to within 5 feet of the ground surface, a cap was placed on the well head and the grout was pumped into the well casing under pressure until no more grout could be forced into the well and the pressure remained stable for 10 minutes. After allowing the grout to cure for a minimum of 24 hours, the upper 5 feet of the well casing was removed by overdrilling. Once overdrilled, a cement mushroom cap was placed over the top of the drilled-out well casing. After allowing sufficient time for the concrete to set up, native soil was used to backfill the remaining hole to ground surface.

Erosion of the stream bank adjacent to MW-42 prohibited the drill rig from being able to safely get close enough to the well to be able to over drill the well casing to the required 5 feet below ground surface (bgs) and as a result, MW-42 was pressure grouted to just below ground surface and capped with concrete. Erosion of the bank adjacent to MW-42 will be monitored and when it becomes possible the well will be cut off below the surface of the streambed and a new concrete cap will be placed over the top of the well.

X:\GIS\Lockheed 23521-1001\Well_Locs_Post Install.mxd

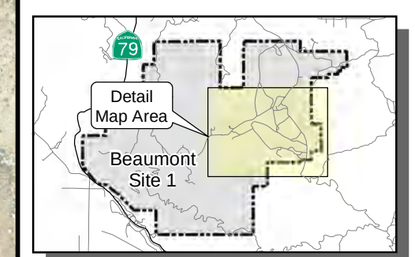


0 500 1,000 Feet

Adapted from: March 2007 aerial photograph.

LEGEND

- New Well
- Rehabilitated Well
- Destroyed Well
- Groundwater Flow Direction
- Groundwater Elevation Contour
- Bedrock/Alluvium Surface Contact
  Dashed where inferred
- Historic Operational Area Boundary
- Beaumont Site 1 Property Boundary



Beaumont Site 1

Figure 2

Well Locations

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Table 1 provides the calculated volume of grout necessary to fill each of the well casings and associated filter pack and documents the actual volume of grout placed in each of the wells to show proper sealing of the well casing.

Table 1 Calculated Grout Volumes versus Actual Volumes Placed

Well ID	Total Well Depth (ft btoc)	Borehole Diameter (inches)	Well Screen Interval (ft bgs)		Well Casing Diameter (inches)	CalculatedGrout Volume (gals, ft^3)	Actual Volume of Grout Placed (gals)
MW-21	100	12	70	100	5	145 gals, 20 ft^3	240
MW-24	105	8	85	105	2	32 gals, 4 ft^3	35
MW-37	62	10	40	60	4	60 gals, 8 ft^3	185
MW-42	35	10	13.2	34.2	4	44 gals, 6 ft^3	50

Notes: Calculated grout volume assumes a value of 30% porosity in the filter pack
ft btoc feet below top of casing
ft bgs - feet below ground surface
ft^3 - cubic feet
gals - gallons

3.2 WELL REHABILITATION

As described in the approved work plan, former extraction well EW-15 and monitoring well MW-24 showed obstructions in each well during a video survey conducted prior to development of the work plan. A proposed well rehabilitation program was developed that included fishing out the obstructions, air-lifting dirt or other debris, swabbing the well casing, and bailing the well to remove foreign material from the bottom of the well casing.

3.2.1 Extraction Well EW-15

Down well video from extraction well EW-15 showed that sediment had collected in the casing at about 60 feet bgs. A small diameter tube or piece of hose was also observed in the video. Well rehabilitation started with tagging the bottom of the hole. Depth to the obstruction was measured at about 59 feet below the top of casing (btoc). Based on boring logs, the reported depth of the well was 105 feet bgs; however, groundwater sampling purge sheets from 1996 show the well being purged dry at 96 feet btoc (LMC 1996). Additionally, during the Burn Pit Area Removal Action the well was converted from an above ground completion to a flush mount completion by removing 1.54 feet of casing from the top of the well. Using fishing equipment (hooks on rope), the driller was able to snag the tubing that was observed in the video log and pull about 15 feet of tubing from the well casing before the tubing broke. Repeated attempts were made to remove additional tubing but were unsuccessful. Pipe was then lowered into the well casing and an air compressor was used to force high pressure air down the pipe to dislodge the obstruction. After the soil, tubing, and other material that was clogging the well had been dislodged, the pipe was removed

and the depth to the bottom of the well was measured at 96.25 feet btoc. A bailer was then used to bail out the remaining sediment from the bottom of the well. Due to the well's limited recharge, the well was bailed dry after removing approximately 6 gallons of water. The well was allowed to recharge and was again bailed dry. This cycle was repeated until approximately 31 gallons of water and sediment had been removed from the well and the bottom of the well felt hard when tagged wth a water level meter probe. The total depth of the well was re-measured at 98.67 feet btoc.

3.2.2 Monitoring Well MW-24

The down hole video log from monitoring well MW-24 showed rope and other debris at approximately 65 feet btoc. After removing the rope and other debris with down hole fishing tools, the total depth of the well was measured at 103.2 feet btoc. A bailer was used to further clean out the bottom of the well casing. During continued bailing, the bailer became lodged in the well casing at approximately 65 feet btoc, the same depth as the obstruction that was removed. After several attempts to retrieve the bailer, the lifting bail broke loose from the bailer and further attempts to retrieve the bailer failed. The depth to the bailer was measured and it was determined that the bailer was sitting on the bottom of the well. A call was made to the County of Riverside Department of Health Services to discuss well destruction methods. The County of Riverside agreed with the recommendations of Tetra Tech that the well should be destroyed by pressure grouting with a cement bentonite grout rather than overdrilling the well.

3.3 WELL INSTALLATIONS

Two replacement monitoring wells were installed as a result of the destruction of MW-37 and MW-42, which were both considered critical to understanding the groundwater contaminant distribution and natural attenuation conditions at the Site. Monitoring well MW-101 was installed to replace MW-42 and monitoring well MW-102 was installed to replace MW-37. Borehole logs and a well construction figures can be found in Appendix B.

The wells were drilled using an 8-inch diameter hollow stem auger to drill a pilot hole which was then reamed using a 10-diameter auger to enable construction of the 4-inch diameter well. The wells were constructed with a continuous 20-foot length of 4-inch diameter, 0.020-inch wire wrapped stainless steel screen and 4-inch diameter schedule 40 PVC blank from the top of the screen to ground surface. During placement of the filter pack, the length of the well screen was surged with a surge block to ensure that the filter pack was properly set and that no bridging of the filter pack had occurred. Once the filter pack had been surged and no further settling of the filter pack was noted, approximately 6-inches of transition sand (No.0/30 sand) was placed. Following placement of the transition sand, a 2-foot thick bentonite seal was placed using bentonite chips. The bentonite chips were allowed to hydrate using potable water for

approximately 45 minutes. Following hydration, a cement-bentonite slurry was mixed using a mixture of one 94-pound sack of Portland cement, not more than 7 gallons of potable water, and no more than 4 pounds of bentonite. The cement-bentonite slurry was then placed from the bentonite chips to the ground surface in one continuous pour. The grout was allowed to cure for a minimum of 24 hours prior to the placement of the well monument and the concrete pad. Both wells were completed with above ground well monuments.

3.3.1 MW-101

MW-101 is located about 115 feet east-southeast of MW-42 away from the active part of the Bedsprings Creek. During drilling, first water was identified at approximately 13 feet bgs. After reaming the borehole the static water level was measured at 13 feet bgs and, based on the borehole logs, appears to originate in a medium to coarse grained sand at about 14 feet bgs. Total depth of the borehole is 30 feet bgs. Based on the borehole log and geotechnical analyses, the upper 15 feet of sediment appears to be predominately alternating layers of silty sands and clayey sands. From 15 feet bgs to about 30 feet bgs the sediment appears to be predominately alternating layers of coarse, poorly graded sand and silty sand. Occasional thin lenses of clay are present from about 9 feet to 23 feet bgs.

The well was constructed with a total depth of 28.5 feet bgs and the well was screened from 28.5 feet bgs to 8.5 feet bgs. The top of the well screen was placed at 8.5 feet bgs to allow a minimum 5 foot sanitary seal as requested by the Riverside County Department of Health Services.

3.3.2 MW-102

MW-102 is located along Potrero Creek just west of the confluence with Bedsprings Creek. MW-102 was situated about 340 feet northeast of MW-37, adjacent to Potrero Creek. During drilling first water was identified at approximately 45 feet bgs. The static water level was measured at 36.5 feet bgs after waiting overnight. Total depth of the borehole is 50 feet bgs. Based on the borehole logs and geotechnical analyses, the upper 30 feet of sediment appears to be predominately alternating layers of poorly graded sand and silty sand. From 30 feet bgs to about 50 feet bgs the sediment appears to be predominately alternating layers of silty sand and clayey sand. The well was constructed with a total depth of 48 feet bgs and the well is screened from 48 bgs to 28 feet bgs.

3.4 WELL DEVELOPMENT

Following a minimum of 24-hours after well construction to allow for the grout to cure, well development was performed at each new well. Well development consisted of a combination of surging, bailing, and pumping. Initially a bailer was placed in the well to remove any solids that entered the well during well

construction. Following removal of the solids, a surge block was placed in the well and moved up and down across the screened interval for a minimum of 10 minutes to break loose any remaining fine sediment within the filter pack. Following surging, the bailer was again placed in the well to remove any fine sediment that was brought into the well during surging. Once the settleable solids were removed from the well and filter pack, a submersible pump was placed in the well and groundwater was pumped from various parts of the screened interval until chemical groundwater stability was achieved and the turbidity was measured at less than 5 nephelometric units (NTUs) or remained constant within 10 NTUs for a least 30 minutes.

3.5 LABORATORY ANALYSES

During the drilling of monitoring wells MW-101 and MW-102 soil samples were collected from each borehole from both the vadose zone and from within the aquifer. A total of 8 samples were collected (4 from MW-101 and 4 from MW-102). All 8 samples were analyzed for grain size distribution using American Society of Testing Materials (ASTM) Method D422, Total Organic Carbon using EPA Method 9060, Metals and Metalloids using EPA Method 6010B for Iron, and Hazardous Characteristics pH using EPA Method 9045C. In addition, samples from MW-102 were also analyzed for Moisture Content using ASTM Standard D2216, Dry Density using ASTM Standard D2937, and Specific Gravity using ASTM Standard D854. Total Porosity was calculated based on the results obtained from the Moisture Content, Dry Density, and Specific Gravity. Table 2 summarizes the results of the analytical and geotechnical analyses that were performed on the soil samples collected from each new monitoring well borehole. Laboratory analytical data packages, which include environmental, field QC, and laboratory QC results are provided in Appendix C

3.6 INVESTIGATION DERIVED WASTE

Drill cuttings and other solid waste generated during well destruction, rehabilitation, and installation activities were temporally stored in 55-gallon drums in the Rocket Motor Production Area (RMPA) near the Mixing Station control bunker until the waste stream could be sampled and analyzed for disposal purposes. In addition, all liquid waste was placed in a 2,500 gallon storage tank in the RMPA near the Mixing Station control bunker for temporary storage, characterization, and subsequent disposal. Appendix D includes laboratory data sheets showing the analytical results of the investigation derived waste that was used to profile the waste stream and includes copies of the waste manifests that identify the volume of material sent off-site for disposal. All waste was disposed of as non-hazardous waste.

3.7 BIOLOGICAL MONITORING

To ensure that the well destruction, rehabilitation, and installation activities did not impact biological resources, a US Fish and Wildlife Service approved biologist was onsite prior to, during, and after the field operation, as specified in the Section 10B Incidental Take Permit. Prior to entering each site, the biologist would identify and mark potential or suspected areas of Stephens' Kangaroo Rat (SKR) concern. This included the ingress and egress routes as well as areas that would be occupied by heavy equipment during the actual site work. Prior to the beginning of each days activities, the biologist met the workers at the entrance to the site and escorted the drill rig and associated equipment to each well site. At the end of each day, the biologist would escort the rig and equipment out of the work areas and remove any protective boards covering potential SKR burrows. The approved biologist also conducted pre- and post-activity SKR burrow mapping according to Montgomery (2006) guidelines where each of the field activities occurred as part of the Incidental Take Permit requirements. This study assesses the impacts of the work activities conducted at each site. The results of the study are included in the annual monitoring report submitted to the United States Fish and Wildlife Service (USFWS) in February. All on-site activities were conducted in accordance with the approved Habitat Conservation Plan (USFWS, 2005) and subsequent clarifications (LMC, 2006a and 2006b).

Table 2 Summary of Analytical and Geotechnical Laboratory Results

Sample No.	Depth (ft bgs)	Soil Type ASTM-D422 (USCS)	Dry Density ASTM D2937 (PCF)	Specific Gravity ASTM D854 (g/cm3)	Total Porosity (%)	Total Organic Carbon (mg/kg)	Iron EPA 6010B (mg/kg)	pH EPA 9045C (pH units)
MW-101-9	9	CL				3700	16000	8.6
MW-101-19	19	SM				9800	23000	8.5
MW-101-21	21	CL				8200	26000	8.4
MW-101-29	29	SM				2900	18000	7.9
MW-102-35	35	SM	114.6	2.696	31.8	940	13000	7.8
MW-102-40	40	SM	115.7	2.684	30.92	780	12000	8.6
MW-102-45	45	SC	95.2	2.72	43.91	1100	11000	9.2
MW-102-50	50	SC	99.3	2.704	41.15	7200	32000	9.4

Notes:

ASTM – American Society for Testing and Materials
USCS – unified soil classification system
ft bgs – feet below ground surface
PCF – pounds per cubic foot
g/cm3 – grams per cubic centimeter
mg/kg – miligrams per kilogram
CL – Low plasticity clay
SM – Silty Sand
SC – Clayey Sand

4.0 SUMMARY

All work described in this report was either done in accordance with the DTSC approved work plan or, in the case of the abandonment of monitoring wells MW-21 and MW-42 where deviation from the work plan occurred, the situation was thoroughly discussed with the County of Riverside Department of Health Services to determine the best way to proceed.

During abandonment activities the minimum quantity of grout required for each location was calculated and compared to the actual amount of grout utilized to abandon the well. In all cases the actual amount of grout used to abandon the well was greater than the amount calculated.

Historic boring logs show the total depth of EW-15 to be 105 feet. After rehabilitation, however, the total depth was found to be 98.67 feet btoc. This depth when added to the 1.54 feet that was removed from the well when it was converted to a flush mount well would have placed the total depth of the well at approximately 100 feet btoc. Given that the bottom of the well feels hard when tagged with a water level meter and historic purge records show the well as being purged dry at 96 feet btoc it is believed that the original depth of the well was approximately 100 feet btoc and that the well has been properly rehabilitated. It is planned to sample EW-15 quarterly for 4 quarters and then re-evaluate its sampling frequency.

Secure locations were identified for replacement monitoring wells MW-101 and MW-102 and the wells were properly installed in accordance with the approved work plan. The locations were chosen in an attempt to represent the geochemical conditions encountered at the locations of the abandoned monitoring wells, MW-42 and MW-37, while still remaining secure from potential erosion of the Potrero and Bedsprings Creeks. MW-101 and MW-102 will be sampled quarterly and the analytical data will be compared to previously obtained data from abandoned monitoring wells MW-42 and MW-37. After 4 quarters, the sampling frequency will be re-evaluated to determine the long term sampling frequency.

5.0 REFERENCES

California Environmental Protection Agency (Cal-EPA)

1995 Monitoring Well Design and Construction for Hydrogeologic Characterization

California Department of Water Resources

1981 Water Well Standards, State of California, Bulletin 74-81

1990 Water Well Standards, State of California, Bulletin 74-90

Lockheed Martin Corporation

1996 April 1996 Water Quality Report, Beaumont Site 1, Beaumont, California, July 30, 1996.

2006a Clarification of Effects on Stephens' Kangaroo Rat from Characterization Activities at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon), August 3, 2006.

2006b Clarification of Mapping Activities Proposed under the Low-Effect Habitat Conservation Plan for the Federally-Endangered Stephens' Kangaroo Rat at Beaumont Site 1 (Potrero Creek) and Site 2 (Laborde Canyon) Riverside County, California (mapping methodology included), December 8, 2006.

Montgomery, Stephen J.

2006. Notes on Mapping of Stephen's Kangaroo Rat Habitat at Beaumont Sites 1 and 2; SJM Biological Consultants, April 4

Tetra Tech, Incorporated (Tetra Tech)

2003a Lockheed Beaumont, Site 1 & 2, Phase 1 Environmental Site Assessment, Beaumont, California. March 2003.

2003b Revised Groundwater Sampling and Analysis Plan, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California. May 2003.

2003c Abandonment of Former Production Wells Work Plan, Beaumont Site 1, Beaumont, California, August 2003.

2007 Groundwater Monitoring Well Installation Work Plan, Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California, February 2007.

2008 Dynamic Site Investigation Work Plan for Lockheed Martin Beaumont Site 1, Beaumont, California, May 2008

2009 Final – Site 1 Well Rehabilitation, Destruction, and Well Installation Work Plan – Revised. Lockheed Martin Corporation, Beaumont Site 1, Beaumont, California.

United States Fish and Wildlife Service (USFWS)

2005 Endangered Species Act Incidental Take Permit for Potrero Creek and Laborde Canyon Properties Habitat Conservation Plan, October 14, 2005.

6.0 ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing and Materials
bgs	below ground surface
BPA	burn pit area
btoc	below top of casing
Cal EPA	California Environmental Protection Agency
CDWR	California Department of Water Resources
CL	Low plasticity clay
COPC	chemical of potential concern
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
EW	extraction well
ft bgs	feet below ground surface
ft	feet
ft^3	cubic feet
gals	gallons
g/cm^3	grams per cubic centimeter
LMC	Lockheed Martin Corporation
LPC	Lockheed Propulsion Company
mg/kg	milligrams per kilogram
MW	monitoring well
NTUs	nephelometric turbidity units
O & M	operations and maintenance
p/ft^3	pounds per cubic foot
PVC	polyvinylchloride
RMPA	Rocket Motor Production Area
SKR	Stephens' Kangaroo Rat
SC	Clayey Sand
SM	Silty Sand
SS	stainless steel

Tetra Tech	Tetra Tech, Inc.
USCS	unified soil classification system
USFWS	United States Fish and Wildlife Service

ENCLOSURE 2: DTSC COMMENTS AND RESPONSES

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

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

Arnold Schwarzenegger
Governor

August 17, 2010

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

SITE 1 WELL REHABILITATION, DESTRUCTION, AND WELL INSTALLATION REPORT, LOCKHEED MARTIN CORPORATION, BEAUMONT SITES 1, BEAUMONT, CALIFORNIA (Site Code: 400200)

Dear Ms. Kato:

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

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

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

Sincerely,

Daniel K. Zogaib
Project Manager
Brownfields and Environmental Restoration Program

Enclosure

cc: See next page.

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

Linda S. Adams
Secretary for
Environmental Protection

Department of Toxic Substances Control

Maziar Movassaghi
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

MEMORANDUM

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

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

DATE: July 22, 2010 (August 4, 2010 – FINALIZED)

SUBJECT: SITE 1 WELL REHABILITATION, DESTRUCTION, AND WELL INSTALLATION REPORT, BEAUMONT, CALIFORNIA APRIL 26, 2010

PCA: 11050 SITE CODE: 400200-00 TRACKING #: 1040016

At the request of DTSC Project Manager, Mr. Daniel Zogaib, the Geological Services Unit (GSU) has reviewed the subject document received on July 13, 2010 for Lockheed Martin Corporation (LMC), Site 1 in Beaumont.

BACKGROUND

On behalf of LMC, Tetra Tech, Inc. (Tetra Tech) prepared the subject document ("Report") for LMC's former Beaumont Site 1 (Potrero Creek) facility (the "Site"). The Site is located approximately 70 miles east of Los Angeles in the city of Beaumont in San Bernardino County, California.

Defective solid rocket propellant was washed out of motor casings with groundwater supplied by a former production well (W-1), now properly abandoned. A high-pressure water jet was used to flush propellant from the motor casings in the Rocket Motor Production Area (Area B). The solid propellant pieces produced from the washout activities were collected in a sieve and later packed into drums and taken to the Burn Pit Area (BPA) landfill (Area C) for burning.

The three primary soil chemicals of potential concern (COPCs) are perchlorate, trichloroethylene (TCE), and poly-chlorinated biphenyls (PCBs). Perchlorate is the most extensive soil COPC at the Site, while TCE and PCBs are detected in a few areas of the Site. Although 1,4-dioxane is also a primary COPC with respect to groundwater, it has not been detected in soil other than a couple of locations outside the BPA (the primary

source area for all COPCs) at concentrations near the method detection limit (MDL) (0.005-0.031 milligrams per kilogram [mg/Kg]); therefore, 1,4-dioxane is not considered a primary soil COPC in these areas. The primary groundwater COPCs which are detected most frequently and at the highest concentrations are perchlorate, 1,1-dichloroethene (1,1-DCE), TCE, and 1,4-dioxane.

The Report describes the results of the rehabilitation, installation, and destruction of five groundwater monitoring wells at the Site.

Remove Obstructions and Rehabilitate	**Destroy and Do Not Replace**	**Destroy and Replace**
EW-15 (successfully rehabilitated)	**MW-21** (was damaged, no replacement proposed)	**MW-37** (near drainage)
MW-24 (destroyed during rehabilitation and abandoned)		**MW-42** (near drainage)

GSU conducted a critical flaw review of the subject document.

SPECIFIC COMMENTS

1. Section 3.1, Page 3-1: MW-24 should be included in this section with MW-21, MW-37, and MW-42 as it was also pressure grouted according to Section 3.2.2.

2. Section 3.2.2, Page 3-4: A rationale should be provided that explains the decision to abandon groundwater monitoring well MW-24 using pressure grouting versus overdrilling.

3. A proposal should be outlined stating the plan for the replacement of MW-24.

Please do not hesitate to contact me with any questions at 714.484.5408 or dkourda@dtsc.ca.gov.

Peer reviewed by: Jose Marcos, PG

cc: Fred Zanoria, CEG, CHg

RESPONSES TO DTSC COMMENTS ON THE SITE 1 WELL REHABILITATION, DESTRUCTION, AND WELL INSTALLATION REPORT
LOCKHEED MARTIN, BEAUMONT, CALIFORNIA
TETRA TECH, INC
AUGUST 2010

Specific Comments		
Comment	**Response**	**Proposed Action**
1. Section 3.1, Page 3-1: MW-24 should be included in this section with MW-21, MW-37, and MW-42 as it was also pressure grouted according to Section 3.2.2.	The proposed change will be made.	The following text will be added to Section 3.1: MW-24 was destroyed by pressure grouting following rehabilitation activities detailed in Section 3.2.2.
2. Section 3.2.2, Page 3-4: A rationale should be provided that explains the decision to abandon groundwater monitoring well MW-24 using pressure grouting versus overdrilling.	Pressure grouting is generally the preferred method for well abandonment due to the difficulties sometimes encountered when attempting to overdrill the well. The method of abandonment was discussed with the County of Riverside Department of Health Services who concurred that given that the well had been cleaned out that abandonment by pressure grouting was appropriate.	No change to the document.
3. A proposal should be outlined stating the plan for the replacement of MW-24.	MW-24 is considered a redundant well, and no replacement well is planned for installation at this time as stated in Section 2.0.	No change to the document.

APPENDIX A

County of Riverside Department of Environmental Health Well Permits

APPENDIX B

Boring Logs and Well Construction Diagrams

APPENDIX C

Laboratory Data Packages

APPENDIX D

Investigation Derived Waste Laboratory Data Packages and Manifests