MATHER AFB
CALIFORNIA

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 301403

DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER

MEMORANDUM FOR SEE DISTRIBUTION

APR 25 2014

FROM: AFCEC/CIBW
3411 Olson Street
McClellan, CA 95652-1003

SUBJECT: Annual and Fourth Quarter 2013 Mather Groundwater Monitoring Report, former Mather Air Force Base

Attached is the *Annual and Fourth Quarter 2013 Mather Groundwater Monitoring Report*, Former Mather Air Force Base, California. Any comments on the report will be addressed in the next quarterly report or fact sheet, and any required changes to the annual report will be incorporated in the Annual and Fourth Quarter 2014 Mather Groundwater Monitoring Report, which is expected to be issued in April 2015.

Please note that the report recommends shutting off four Unit B extraction wells in which concentrations of all contaminants have been below aquifer cleanup levels, based upon the decision logic adopted by the program. The EW-1B pump failed 24 March, and the other three wells (EW-4B, -5B, and -6B) were shut off in on 28 March to allow an evaluation of capture from the other B-zone extraction wells. Further evaluation based on 2014 water level observations and water quality samples will be presented in the second quarter fact sheet and the 2014 annual report as appropriate, with recommendation to resume operation or continue to leave each of these wells off.

Questions should be addressed to me at (916) 643-0830, ext. 202, or Bill Hughes, CNTS, at (916) 997-1564.

DOUGLAS L. SELF
BRAC Environmental Coordinator

Attachment:
Annual and Fourth Quarter 2013 Mather Groundwater Monitoring Report (URS, April 2014)

DISTRIBUTION:
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URS, Attn: Paul Graff (without atch.)
U.S. EPA Region IX, Attn: John Lucey

URS

18600771.23004

25 April 2014

Mr. Stanley Pehl
BRAC Program Manager
HQ AFCEC/CIBW
2261 Hughes Avenue, Suite 155
Lackland AFB TX 78236-9853

Subject: Annual and Fourth Quarter 2013 Mather Groundwater Monitoring Report, Contract FA4890-06-D-0006, Task Order 0007
Former Mather Air Force Base (Mather), California

Dear Mr. Pehl:

In accordance with our contract, URS Group, Inc. (URS) is submitting the Annual and Fourth Quarter 2013 Mather Groundwater Monitoring Report for the former Mather Air Force Base (Mather), California. The Report presents the activities conducted and data collected for the Mather Groundwater Monitoring Program during 2013.

Please note that the report recommends that four Unit B extraction wells, in which concentrations of all contaminants have been less than aquifer cleanup levels, be shut down based upon the decision logic adopted by the program. Extraction was stopped at these wells in late March to allow the evaluation of capture by remaining Unit B extraction wells. Evaluation based on second quarter 2014 water level observations and water quality samples will be presented in the second quarter fact sheet and the 2014 annual report, with recommendations for the wells to remain off or to resume extraction.

Should you have questions or comments, please contact Paul Graff at (916) 634-1818 or Tim Gere at (916) 679-2022.

Sincerely,
URS Group, Inc.

Paul Graff

Paul Graff, P.G.
Project Manager

Attachment:
Annual and Fourth Quarter 2013 Mather Groundwater Monitoring Report

URS Corporation
Crown Corporate Center
2870 Gateway Oaks Drive, Suite 150
Sacramento, CA 95833
Tel: 916.679.2000
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URS

Mr. Stanley Pehl
AFCEE Program Manager
25 April 2014

cc: See distribution list, AFCEC/CIBW cover letter
https://afcee-eim.brooks.af.mil/Projects/PM/DZ
URS Project File (18600771.23004)

18600771.23004

ANNUAL AND FOURTH QUARTER 2013
MATHER GROUNDWATER MONITORING REPORT
FORMER MATHER AIR FORCE BASE, CALIFORNIA

Prepared for:

AFCEC/CIBW
Stanley Pehl
2261 Hughes Avenue, Suite 155
Lackland AFB, Texas 78236-9853

In Support of:

AFCEC/CIBW
3411 Olson Street
McClellan, California 95652-1003

Prepared by:

URS Group, Inc.
2870 North Gateway Oaks Drive, Suite 150
Sacramento, California 95833

April 2014

STATEMENT OF LIMITATIONS

DEPARTMENT OF THE AIR FORCE - AIR FORCE CIVIL ENGINEER CENTER
FORMER MATHER AIR FORCE BASE
ANNUAL AND FOURTH QUARTER 2013 MATHER GROUNDWATER MONITORING REPORT

April 2014

This report was prepared by the staff of URS Group, Inc. (URS) under the supervision of registered professionals. The data interpretation, conclusions, and recommendations presented in the report were governed by URS' experience and professional judgment. This report has been prepared based on data current at the time of preparation. Assumptions based on this data, although believed reasonable and appropriate based on the data provided herein, may not prove to be true in the future as new data are collected. The conclusions and recommendations of URS are conditioned upon these assumptions.

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

Page

APPENDICES
(provided on compact disc only)

LIST OF TABLES

LIST OF TABLES (Continued)

LIST OF FIGURES

LIST OF FIGURES (Continued)

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ACRONYMS AND ABBREVIATIONS

ACL	aquifer cleanup level
AC&W	Aircraft Control and Warning
AFBCA	Air Force Base Conversion Agency
AFCEC	Air Force Civil Engineer Center
AFRPA	Air Force Real Property Agency
ARAR	applicable or relevant and appropriate requirement
Bd	deep Unit B well
bgs	below ground surface
Boeing	The Boeing Company
Bs	shallow Unit B well
Bu	upper B unit
Cal Am	California American Water Company
CCl_4	carbon tetrachloride
CCV	continuing calibration verification
CFR	Code of Federal Regulations
COC	contaminant of concern
Contingency Plan	Mather AFB Off-Base Water Supply Contingency Plan
CVWB	Central Valley Regional Water Quality Control Board
CZA	capture zone analysis
DCA	dichloroethane
DCE	dichloroethene
DCP	dichloropropane
DL	detection limit
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Difference(s)
FD	field duplicate
FFS	Focused Feasibility Study
ft/ft	feet/foot per foot
GAC	granular-activated carbon
gpm	gallons per minute
Granite	Granite Construction Company
HSG	hydrostratigraphic
IRP	Installation Restoration Program
IT Corp.	International Technology Corporation
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
lbs/day	pounds per day
LF	landfill
LMT	Laguna-Mehrten Transition

ACRONYMS AND ABBREVIATIONS (Continued)

Mather	the former Mather Air Force Base
MAFB	Mather Air Force Base (well designator)
MBS	Main Base/SAC Area (well designator)
MBSA	Main Base/SAC Area
MCL	maximum contaminant level
MS/MSD	matrix spike/matrix spike duplicate
msl	mean sea level
MWH	MWH Americas, Inc.
NEP	Northeast Plume
NOA	Notice of Applicability
NS	normal sample (sample designator and Section 8)
OFB	well designator for off base wells not owned by the Air Force
OPS	operating properly and successfully
OU	operable unit
PCB	polychlorinated biphenyl
PCE	perchloroethene, a.k.a. tetrachloroethene
POL	petroleum, oil, and lubricants
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
QC	quality control
RL	reporting limit
ROC	reactive organic compound
ROD	Record of Decision
SAC	Strategic Air Command
SAP	Sampling and Analysis Plan
SOVC	semivolatile organic compound
TB	trip blank
TCE	trichloroethene
TDS	total dissolved solids
Teichert	Teichert Aggregates Company or Teichert Land Company
TPH	total petroleum hydrocarbon
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
TSS	total suspended solids
URS	URS Group, Inc.
UTL	upper tolerance limit
VOC	volatile organic compound

ACRONYMS AND ABBREVIATIONS (Continued)

WDR	waste discharge requirement
West Drainage Canal	West Ditch
WP07	Site 7
WP12	Site 12
4Q13	fourth quarter of 2013
μg/L	micrograms per liter

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EXECUTIVE SUMMARY

In accordance with Task Order 0007, Contract FA4890-06-D-0006, URS Group, Inc. has prepared this *Annual and Fourth Quarter 2013 (4Q13) Mather Groundwater Monitoring Report* for the Air Force groundwater remediation program at the former Mather Air Force Base (Mather) and vicinity. The goal of the annual report is to present and interpret groundwater monitoring and groundwater treatment system monitoring data to assess the performance of the groundwater components of the remedies selected in the relevant Mather decision documents (Air Force Base Conversion Agency [AFBCA], 1993; AFBCA, 1995; AFBCA, 1996; AFBCA, 1997; Air Force Real Property Agency [AFRPA], 2008a; and AFRPA, 2010a). The performance assessments document successful groundwater remediation, identify areas of uncertainty in the assessment regarding distribution and movement of groundwater contamination at Mather, and recommend steps to address any significant uncertainty. Additionally, compliance with the applicable cleanup goals, water quality standards, and approved decision documents is reported. Appendices to this report contain extensive summaries of current and historical analytical data and groundwater elevation trends.

The groundwater monitoring program includes remedial performance monitoring of three groundwater extraction and treatment systems that operate on separate plumes: the Aircraft Control and Warning (AC&W) Site, Site 7, and Main Base/Strategic Air Command (SAC) Area (MBSA) plumes. The program also includes Northeast Plume (NEP) monitoring and post-closure monitoring at three closed landfills (LF03, LF04, and WP07) that contain waste beneath engineered landfill caps. The off-base monitoring program has additional objectives that address the chlorinated solvent plumes near off-base water supply wells.

The selected remedial alternatives for the Groundwater Operable Unit (OU) Main Base/SAC Area Plume, Site 7 Plume, and NEP at Mather are documented in the Superfund Record of Decision (ROD), Soil OU Sites and Groundwater OU Plumes (AFBCA, 1996) as modified by the Explanation of Significant Differences (ESD) (AFRPA, 2010a) and include groundwater extraction, air stripping with groundwater injection, groundwater monitoring for the Main Base/SAC Area and Site 7 plumes, and long-term monitoring for the NEP, with institutional controls to prevent exposure to the contaminated groundwater and to protect and maintain access to the remedy components. Injection of treated water from the MBSA treatment plant was supplemented with surface-water discharge in 2011 after injection capacity decreased to the point where all the treated water could no longer be consistently injected.

The selected remedial alternative for the AC&W groundwater plume is documented in the AC&W ROD (AFBCA, 1993), as modified by two ESD documents (AFBCA, 1997; AFRPA, 2008a) and includes groundwater extraction, air stripping, injection of treated effluent, and institutional controls to prevent exposure to contaminated groundwater and to protect and maintain access to the remedy components. Injection of treated water from the AC&W groundwater treatment system was changed to surface water discharge in 1997 under authority of the 1997 ESD. A pipeline that discharges treated water from the AC&W treatment system to Mather Lake was constructed in 1997; the injection wells have not been used since mid-1997 and were permanently decommissioned in 2009. The institutional controls were added by the 2008 ESD.

The following is a summary of notable results and observations during 2013 for each groundwater monitoring program. The discussions below indicate where changes in contaminant concentration suggest changes in contaminant distribution or remedial progress.

Northeast Plume Monitoring Program. The NEP, with apparent source areas at Northeast Perimeter Landfills LF03 and LF04, was selected for a remedial action of long-term monitoring under the Groundwater OU (AFBCA, 1996). The volatile organic compound (VOC) contamination present at the

NEP is addressed under the Groundwater OU; the NEP VOC monitoring also satisfies some Landfill OU groundwater monitoring requirements.

Historical data trends, current groundwater levels, and the hydrogeologic conceptual model indicate the aquifer cleanup level volume is isolated to a few wells in close proximity to LF03 and LF04 and is not expected to expand laterally. In 2013, tetrachloroethene (PCE) and cis-1,2-dichloroethene (DCE) were detected exceeding their cleanup levels in Unit C well Mather Air Force Base (MAFB)-398C, which was first observed to occur in 2Q09 for cis-1,2-DCE and 4Q09 for PCE. This indicates that as the water table has fallen and the rate of lateral contaminant transport has decreased, concentrations of chemicals exceeding cleanup levels have migrated to the depth of this well at greater concentrations than previously observed. This is compatible with the conceptual model for the site. The current monitoring network of the NEP wells is adequate to meet the corrective action monitoring requirements specified in the ROD, with the exception of MAFB-398C.

Contaminant of Concern	Cleanup Level (µg/L)	Well	Maximum 2013 Detection (µg/L)
cis-1,2-Dichloroethene	6.0	MAFB-132	41
Tetrachloroethene	5.0	MAFB-132	33
Carbon tetrachloride	0.5	--	not detected
Chloromethane	3.0	--	not detected
1,2-Dichloropropane	5.0	MAFB-398C	1.0 J

J = estimated concentration between detection limit and reporting limit
µg/L = micrograms per liter

Landfill Post-Closure Monitoring Programs. Post-closure monitoring programs are required for LF03 and LF04, as well as for the landfill at Site 7 (WP07) located on the southern margin of Mather. Monitoring includes detection monitoring for selected VOCs and also for non-VOCs, which include metals and general minerals for LF03 and LF04, and metals for WP07. The NEP and Site 7 Plume remedial actions for VOCs were selected under the Groundwater OU and are discussed in Sections 3.0 and 5.0, respectively.

The evaluation of nickel and chromium exceeding calculated background concentrations in LF03 and LF04 was addressed in 2012 and 2013 by installing monitoring well MAFB-465 with a polyvinyl chloride screen upgradient of MAFB-132, a LF04 well with nickel and chromium concentrations greater than background concentrations. Sample results from four quarters of sampling supported the hypothesis that the metals exceeding background concentrations are associated with stainless steel screens. Accordingly, evaluation monitoring for nickel and chromium is no longer necessary and these wells have returned to detection monitoring.

AC&W Performance Monitoring. During 2013, the AC&W treatment system consisted of six active extraction wells and the treatment plant. During 2013 ACW EW-2 and ACW EW-6R were shut down in order to optimize the extraction of groundwater containing trichloroethene (TCE) exceeding the aquifer cleanup level (ACL). However, based on concentration rebound at ACW EW-6R, extraction at this well was restarted. The AC&W treatment plant ceased operating on 29 December 2012 due to vandalism and the theft of crucial system components. Consequently, all of the extraction wells were shut down. The system was restarted on 15 March 2013. While the plant was operating during 2013, the treatment system operated at an average flow rate of 88 gallons per minute (gpm) with an average TCE influent concentration of 8.9 micrograms per liter (µg/L). The system removed approximately 2.7 pounds of VOCs during 2013. Total gallons of groundwater treated and pounds of TCE removed by the AC&W treatment plant are presented on the graph at the end of this Executive Summary. Total influent concentrations have declined from a high of 170 µg/L observed in three samples in 1995 through 1997. The maximum TCE concentration observed in the AC&W wells sampled during 2012 was 35 µg/L in monitoring well MAFB-453. All treated water in 2013 was discharged to Mather Lake. Remediation of the plume is progressing, as indicated by the continued decrease in TCE concentrations from samples collected from monitoring wells and extraction wells in the central and downgradient portions of the plume. However, 2013 concentrations were higher than previous results in many wells in the upgradient portion of the plume.

Site 7 Performance Monitoring. The Site 7 groundwater treatment system consists of two extraction wells (7-EW-01 and 7-EW-02), the groundwater treatment plant, and four injection wells. The extraction wells operated at a combined average flow rate of approximately 42 gpm during 2013 and removed approximately 2.8 pounds of VOCs from groundwater. The average influent total VOC concentration was approximately 15.4 µg/L. Total gallons of groundwater treated and pounds of VOCs removed by the Site 7 treatment plant are presented on the graph at the end of this Executive Summary. Decreasing concentration trends in the extraction wells and in nearby monitoring wells show the effectiveness of the groundwater extraction. The table below presents the maximum contaminant of concern (COC) detections in groundwater wells that monitor the Site 7 Plume; only TCE and 1,2- dichloroethane (DCA) were detected at concentrations greater than their respective ACLs. Detections from perched zone wells are not included in the table.

Contaminant of Concern	Cleanup Level (µg/L)	Well	Maximum 2013 Detection (µg/L)
1,1 -Dichloroethene	6.0	MAFB-149	0.7
1,2-Dichloroethane	0.5	MAFB-041	2.6
cis-1,2-Dichloroethene	6.0	MAFB-041	3.1
Benzene	1.0	--	not detected
1,4-Dichlorobenzene	5.0	--	not detected
Chloromethane	3.0	--	not detected
Vinyl chloride	0.5	--	not detected
Trichloroethene	5.0	MAFB-446	21
Tetrachloroethene	5.0	MAFB-446	3.5
Total petroleum hydrocarbons as diesel	100.0	--	not detected

µg/L = micrograms per liter

In the perched zone, which occurs at roughly 50 feet below ground surface (approximately 25 feet above mean sea level), TCE and 1,2-DCA were the only COCs detected a concentrations greater than their ACLs for the underlying aquifer.

Main Base/SAC Area Performance Monitoring. In 2013, the Main Base/SAC Area remedial system consisted of 27 active extraction wells, a treatment plant with 2 air stripping towers to remove VOCs, and four injection wells. During 2013, the Main Base/SAC Area extraction wells operated at a combined average flow rate of 1,484 gpm and removed 80 pounds of VOCs from groundwater. Total gallons of groundwater treated and pounds of VOCs removed by the Main Base/SAC Area treatment plant are presented on the graph at the end of this Executive Summary. Beginning in September 2011, due to injection well operations and maintenance issues that have restricted well capacity, the Air Force began discharging some of the treated groundwater into the nearby West Ditch (West Drainage Canal) that ultimately flows to Morrison Creek, a tributary to the Sacramento River. By the end of 2013, approximately 566 gpm was being discharged to Morrison Creek. COCs for the Main Base/SAC Area Plume, and their maximum observed concentrations for 2013, are presented in the table below.

Contaminant of Concern	Cleanup Level (µg/L)	Well	Maximum 2013 Detection (µg/L)
1,1-Dichloroethene	6.0	MAFB-418	5.6
1,2-Dichloroethane	0.5	MAFB-033	0.4 J
cis-1,2-Dichloroethene	6.0	MAFB-417	4.1
Benzene	1.0	--	not detected
Carbon tetrachloride	0.5	MBS EW-5ABu	12
Chloromethane	3.0	MAFB-167, MAFB-261, MAFB-380B, MAFB-436, MAFB-463Dd	0.3 J
Lead	15	--	not detected
Tetrachloroethene	5.0	MBS PZ-51	86
Trichloroethene	5.0	MAFB-420	55
Xylenes	17.0	--	not detected
Total petroleum hydrocarbons as gasoline	50	MAFB-314	22
Total petroleum hydrocarbons as diesel	100	MAFB-419	70 F

F = estimated concentration
J = estimated concentration between detection and reporting limits
µg/L = micrograms per liter

The Main Base/SAC Area (MBS) Plume is observed in three main hydrostratigraphic units: the water table (includes Units A and Bu), Unit B, and Unit D. The maximum COC detections from wells completed across or just below the water table continue to be observed at the Site 57 source area, where hot spot (10 times the ACL) concentrations are observed for TCE and carbon tetrachloride (CCl_4), and at groundwater monitoring well MAFB-439, where hot spot concentrations were observed for PCE and CCl_4 in 2013. The interpreted extent of the Site 57 hot spot appears to be decreasing, likely due to extraction at MBS EW-1ABu, EW-2ABu, EW-4ABu, EW-5ABu, and EW-2AR. Historically, there has been a 1,1-DCE plume exceeding the ACL at the north side of Site 57 and as of 2013, no groundwater samples contained 1,1-DCE exceeding the ACL.

The Unit B VOC plume was defined by detections of TCE, PCE, and CCl_4 greater than cleanup levels and its area was smaller in 2013 than in 2012, as interpreted concentration contours were closer to the source areas due to decreased concentrations at the head of the plume and the toe of the Southwest Lobe of the Plume. The estimated capture area associated with MBS EW-13BuB is slightly smaller relative to that of 2012, and a small portion of the Southwest Lobe TCE plume may be beyond the estimated 2013 capture zone.

The Unit D VOC plume was defined by detections of TCE, PCE, and CCl_4 greater than cleanup levels. The plume extent was generally stable although the PCE concentration was lower in MAFB-318, located in the western-most part of the plume. PCE is at hot spot concentrations beneath the northwest Mather boundary (along the axis of the plume). CCl_4 is no longer at hot spot concentrations at off-base location MAFB-318. The CCl_4 concentration detected at MAFB-318 (6.6 µg/L) in 2012 was the highest CCl_4 concentration detected beyond the boundaries of Mather that year. The concentration at MAFB-318 in 2013, while still the highest concentration detected outside Mather, was 4.4 µg/L. CCl_4 concentrations at MAFB-318 had shown a gradually increasing trend since approximately 2002 with a steeper rate of increase occurring after approximately 2009.

Off-Base Water-Supply Well Monitoring. Ten high-volume, off-base groundwater production wells are sampled regularly to monitor for evidence of VOC contaminants originating at Mather. The two Juvenile Hall supply wells (OFB-51 and OFB-52, where OFB is a well designator for off-base wells not owned by the Air Force) had a treatment system operating during 2013; influent water was treated by granular-activated carbon (GAC) to remove VOC contamination, primarily CCl_4. The GAC system at the Moonbeam well (OFB-04) was reinstalled in 2012 because CCl_4 concentrations exceeded the threshold (one-half the maximum contaminant level [MCL]) requiring the Air Force to operate the system per Revision 1 of the *Mather AFB Off-Base Water Supply Contingency Plan* (AFRPA, 2008b). The GAC system continued to operate in 2013, even though CCl_4 concentrations were less than one-half the MCL throughout 2013. Total gallons of groundwater treated and pounds of VOCs removed by these treatment plants are presented on the graph at the end of this Executive Summary.

Thirty-one privately owned water supply wells were sampled during 2013. TCE was detected in all four quarterly samples collected from OFB-72 at concentrations ranging from 0.7 (estimated) to 1.6 µg/L. Detections less than or equal to 0.2 µg/L of PCE were also reported in the 2Q13, 3Q13, and 4Q13 samples from OFB-72. Water from this well is used for dust control on mining roads and possibly on conveyor belts; it is not used as a potable water supply. VOC detections in other privately owned wells that have been sampled annually were consistent with historical results. All detections were less than respective Safe Drinking Water Act MCLs for detected constituents.

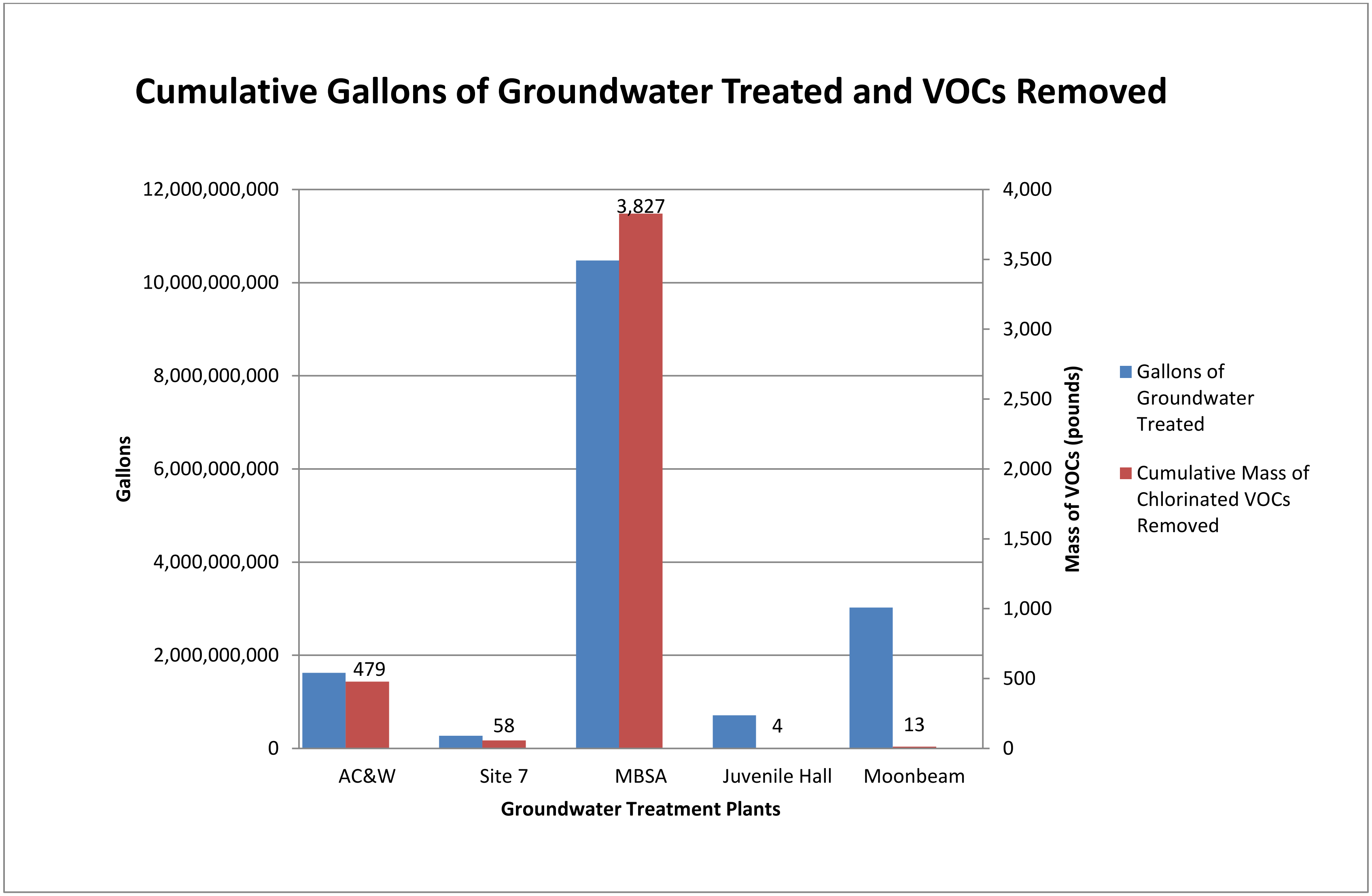
Plume Capture Summary

Based on the 2013 plume extents and estimated capture zones interpreted from 2013 potentiometric surface data, the plumes being remediated by groundwater extraction and treatment are almost completely captured. The table below summarizes percent capture and exceptions to capture for each plume treated by groundwater extraction.

Plume	Hydrostratigraphic Unit	Percent Capture[a]	Comments
AC&W	C	100	Plume is captured.
Site 7	B/C	100	Plume is captured.
MBSA	WT	100	Small parts of the TCE and CCl_4 plumes may be beyond capture of the water table extraction wells, but are interpreted to be captured by MBS EW-13BuB.
	B/C	>99	Less than one percent of the Southwest Lobe may be beyond capture.
	D	100	Plume is captured.

[a] Percent capture was calculated based on areal extent of the composite plume exceeding ACLs in the target hydrostratigraphic unit.

AC&W = Aircraft Control and Warning
ACL = aquifer cleanup level
CCl_4 = carbon tetrachloride
MBSA = Main Base/SAC Area
TCE = trichloroethene
WT = water table
> = greater than


Cumulative Gallons of Groundwater Treated and VOCs Removed
Gallons
12,000,000,000
10,000,000,000
8,000,000,000
6,000,000,000
4,000,000,000
2,000,000,000
0
Mass of VOCs (pounds)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
3,827
479
58
4
13
AC&W
Site 7
MBSA
Juvenile Hall
Moonbeam
Groundwater Treatment Plants
Gallons of Groundwater Treated
Cumulative Mass of Chlorinated VOCs Removed

1.0 INTRODUCTION

In accordance with Task Order 0007, Contract FA4890-06-D-0006, URS Group, Inc. (URS) has prepared this *Annual and Fourth Quarter 2013 (4Q13) Mather Groundwater Monitoring Report* for the Air Force groundwater remediation program at the former Mather Air Force Base (Mather) and vicinity. Groundwater monitoring includes measuring depths-to-groundwater (referred to as gauging) and collecting and analyzing water samples from groundwater extraction and treatment systems, monitoring wells, on- and off-base piezometers, and off-base county and private water supply wells.

The objectives of this report are to provide 4Q13 monitoring results, and assess monitoring data for all of 2013 with respect to patterns of groundwater flow, distribution of contaminants of concern (COCs), and performance of the groundwater extraction networks and treatment systems. This report is organized as follows:

- Section 1.0, Introduction, describes Mather and its background, the history of each site/plume and its remedial objectives, and the current understanding of the hydrogeology at Mather.
- Section 2.0, Mather Groundwater Monitoring Program, provides an overview of the 2013 Mather groundwater monitoring program activities. This section presents a summary of gauging and sample collection activities, a discussion and evaluation of the groundwater potentiometric surface maps, and a summary of monitoring well maintenance and status for 2013.
- Section 3.0, Landfill Post-Closure and Northeast Plume Monitoring Program, discusses the analytical results of samples collected from wells used for monitoring the Northeast Plume (NEP) and for post-closure monitoring at Landfill (LF) Sites LF03, LF04, and Site 7 (WP07).
- Sections 4.0, 5.0, and 6.0, Remedial Performance Monitoring Programs for the Aircraft Control and Warning (AC&W) Site (WP12), Site 7, and Main Base/Strategic Air Command (SAC) Area (MBSA), respectively, discuss performance monitoring results and evaluate the performance of each groundwater extraction and treatment system.
- Section 7.0, Off-Base Water Supply Well Monitoring Program, provides results of samples collected from off-base water supply wells and discusses analytical results from samples collected from nearby monitoring wells.
- Section 8.0, Analytical Data Quality Summary, discusses the analytical program, the quality control (QC) sample results, and how those results impact the groundwater analytical data collected during 2013.
- Section 9.0, Summary, Conclusions, and Recommendations, summarizes key observations in the monitoring results and recommends improvements to the remediation systems and monitoring programs.

Appendices to this report are organized as follows:

- Appendix A, Analytical Data Tables: Tables A-1 through A-4 present analytical results for the last 2 years. The well list in each table is in alphanumeric order by well name.
- Appendix B, Water-Table Hydrographs: This appendix presents yearly second-quarter groundwater elevation hydrographs for water-table wells (grouped by hydrostratigraphic [HSG] unit and study area).
- Appendix C, Concentration Trend Plots: This appendix presents time–concentration plots for the primary COCs at each of the four Mather groundwater plumes.

- Appendix D, Main Base/SAC Area, AC&W, and Site 7 Plume Treatment Plant Air Strippers: Compliance with Air Emissions Standards: This appendix presents an update on the compliance with air emission standards by the MBSA, AC&W, and Site 7 treatment systems.
- Appendix E, First Quarter 2013 Analytical Data: This appendix presents 1Q13 analytical data.
- Appendix F, Second Quarter 2013 Analytical Data: This appendix presents 2Q13 analytical data.
- Appendix G, Third Quarter 2013 Analytical Data: This appendix presents 3Q13 analytical data.
- Appendix H, Fourth Quarter 2013 Analytical Data: This appendix presents 4Q13 analytical data.
- Appendix I, List of Dry Wells 2013: This appendix compares water levels to screen elevations and presents a list of wells that were dry during at least part of 2013.
- Appendix J, Mather Groundwater Monitoring Well Decommissioning Memorandum: This appendix contains the *Technical Memorandum for Decommissioning Select Site-wide Groundwater Monitoring and Extraction Wells*, which reports on the details of the decommissioning of 19 groundwater monitoring wells and two groundwater extraction wells during 2013.
- Appendix K, 2,000-Foot Plume Boundary Consultation Zone Map, Annual 2013: This appendix presents the 2013 Consultation Zone map developed to support implementation of Sacramento County Code, Title 6, Chapter 6.28.

The following sections describe Mather and the groundwater monitoring program.

1.1 SITE DESCRIPTION AND BACKGROUND

Mather is in the County of Sacramento, partially within the City of Rancho Cordova, California, approximately 10 miles east of downtown Sacramento, as shown on Figure 1-1. The former Air Force Base is south of U.S. Highway 50, a major east-west route of the U.S highway system. Mather was closed as an active air base under the Base Realignment and Closure Act on 30 September 1993. At that time, it encompassed approximately 5,845 acres (including 129 acres of easements) in an unsurveyed portion of Township 8 North, Ranges 6 East and 7 East. Figure 1-2 presents a site map.

Environmental cleanup at Mather is managed by the Air Force under the Installation Restoration Program (IRP). Remedial investigations and cleanup activities have been implemented under this program for environmentally impacted IRP sites. These activities include the installation of groundwater monitoring wells to evaluate groundwater contamination both on the former base and beyond the Mather property line. Approximately 570 groundwater wells and piezometers and 35 operating extraction wells were included in the groundwater monitoring program at Mather during 2013.

Portions of the groundwater off base to the west-southwest of Mather are contaminated by chemicals that were used during routine operations at Mather, which began operations in 1918 and closed in 1993. IRP sites have been identified as sources of groundwater contamination. There are five areas of groundwater monitoring at Mather (Figure 2-1):

- **AC&W Site Plume:** The AC&W Site Plume reportedly resulted from disposal of solvents in a waste disposal pipe or dry well at IRP Site 12 (WP12) from 1958 to 1966.
- **Site 7 Plume:** The source area for the Site 7 (WP07) Plume was a gravel borrow pit used as a landfill into which waste was disposed from 1953 to approximately 1966. The borrow pit was reportedly used to dispose of petroleum, oil, and lubricant (POL) wastes, empty drums, sludge from plating shops, absorbent sand used for cleaning oil and solvent spills, and at least one load

of transformer oil that may have contained polychlorinated biphenyls (PCBs). The Site 7 groundwater extraction and treatment system operated intermittently from 1998 through 2006 with interruptions to accommodate off-base mining and related reclamation activities (from July 1999 to May 2001; July 2001 to March 2002; and April 2003 to mid-December 2006). The extraction and groundwater treatment system resumed operation in December 2006 and has since operated continually.

- **Landfills and NEP:** The NEP is in the northeast part of Mather, south-southwest of LF03 and LF04. Sources of contamination include landfill disposal.
- **MBSA Plume:** The commingled contaminant plume resulting from sources at several IRP sites in the northwest part of Mather is referred to as the MBSA Plume. Multiple source areas of contamination resulted from industrial activities, equipment maintenance, dry cleaning, and fuel storage and delivery.
- **Off-base Area:** The off-base area is identified as the portion of the MBSA and Site 7 plumes that have migrated beyond Mather property boundaries. The monitoring program referred to as "Off Base," is the monitoring of large water supply wells, selected nearby monitoring wells, and generally smaller, privately owned supply wells in the vicinity of and downgradient from the plumes. The sampling of these wells is governed by the *Final Revision 2 Mather AFB Off-base Water Supply Contingency Plan* (Contingency Plan) (Air Force Civil Engineer Center [AFCEC], 2013).

The table below lists each plume, its governing decision documents, selected remedial action, and current status of the remedial action.

Plume	Decision Document	Remedial Action	Status as of 2013
AC&W	*Superfund ROD: Aircraft Control and Warning Site, Mather Air Force Base, Sacramento County, California.* (AFBCA, 1993). *Explanation of Significant Difference for the AC&W OU* (AFBCA, 1997). *Explanation of Significant Difference for the AC&W Operable Unit* (AFRPA, 2008a).	Groundwater extraction, air stripping with off-gas treatment, as necessary, groundwater discharge to Mather Lake and groundwater monitoring. Institutional controls.	Remedial action in place and operating. OPS determination in 1998 (EPA, 1998). Continued operations and performance monitoring. Discharged treated water to surface water. Figure 4-1 presents the capture zone assessment.
Site 7	*Superfund ROD: Soil OU Sites and Groundwater OU Plumes, Mather Air Force Base, Sacramento County, California*. (AFBCA, 1996). *Revised Final Explanation of Significant Difference from the ROD for Soil OU Sites and Groundwater OU Plumes* (AFRPA, 2010a).	Groundwater extraction, air stripping with off-gas treatment, as necessary, injection, and groundwater monitoring. Institutional controls.	Remedial action in place and operating. OPS determination in 2011 (EPA, 2011). Continued operations and performance monitoring. Injected treated water. Figure 5-1 presents the capture zone assessment.

Plume	Decision Document	Remedial Action	Status as of 2013
Landfills (LF03, LF04, and WP07)	For LF03 and LF04: *Superfund ROD, Landfill OU Sites* (AFBCA, 1995). For WP07: *Superfund ROD: Soil OU Sites and Groundwater OU Plumes, Mather Air Force Base, Sacramento County, California* (AFBCA, 1996), and *Revised Final Explanation of Significant Difference from the ROD for Soil OU Sites and Groundwater OU Plumes* (AFRPA, 2010a).	Capping of landfills and post-closure groundwater monitoring. Institutional controls.	Remedial action in place. Background concentrations for metals and general mineral constituents defined in 2005.
NEP	*Superfund ROD, Soil OU Sites and Groundwater OU Plumes, Mather Air Force Base, Sacramento County, California* (AFBCA, 1996). *Revised Final Explanation of Significant Difference from the ROD for Soil OU Sites and Groundwater OU Plumes* (AFRPA, 2010a).	Long-term groundwater monitoring. Institutional controls.	Remedial action in place. OPS determination in 2011 (EPA, 2011). Continued long-term groundwater monitoring.
MBSA	*Superfund ROD: Soil OU Sites and Groundwater OU Plumes, Mather Air Force Base, Sacramento County, California* (AFBCA, 1996). *Revised Final Explanation of Significant Difference from the ROD for Soil OU Sites and Groundwater OU Plumes* (AFRPA, 2010a).	Groundwater extraction, air stripping with off-gas treatment, as necessary, injection, surface water discharge, and groundwater monitoring. Institutional controls.	Remedial action in place and operating. OPS determination in 2011 (EPA, 2011). Continued operations and performance monitoring. Discharged up to approximately 600 gpm treated groundwater to surface water in 2013. Injected remainder of treated water. Figures 6-2 through 6-11 present the capture zone assessments.
Off-base	*Superfund ROD: Soil OU Sites and Groundwater OU Plumes, Mather Air Force Base, Sacramento County, California* (AFBCA, 1996).	Identify potentially impacted supply wells, develop monitoring plan, identify alternative water supply options, determine effect of supply well pumping, and mitigate potential vertical migration near supply wells.	*Final Revision 2 Mather AFB Off-base Water Supply Contingency Plan* (AFCEC, 2013) superseded the previous plans implemented since 1998. GAC wellhead treatment system at Juvenile Hall (OFB-51 and OFB-52) in place and operating since 1997. GAC wellhead treatment system at Moonbeam (OFB-04) reinstalled in 2012 and operated through 2013.

AC&W = Aircraft Control and Warning
AFBCA = Air Force Base Conversion Agency
AFCEC = Air Force Civil Engineer Center
AFRPA = Air Force Real Property Agency
EPA = United States Environmental Protection Agency
GAC = granular-activated carbon
gpm = gallons per minute
MBSA = Main Base/SAC Area
NEP = Northeast Plume
OPS = operating properly and successfully
OU = operable unit
ROD = record of decision

1.2 MATHER GROUNDWATER MONITORING

Groundwater monitoring occurred sporadically from 1984 through 1989. Routine groundwater monitoring began in 1990, with groundwater samples collected quarterly and depths to groundwater gauged and recorded monthly. During 1993, wells were gauged every other month. From 1994 through 2006, wells were gauged quarterly. In 2007, the Air Force committed to semiannual gauging, with the option for more frequent measurements in selected areas as needed to guide decisions.

The groundwater monitoring program objectives include:

- Monitoring seasonal variations in groundwater elevations and gradients within each HSG unit
- Monitoring the extent of contamination and progress toward achieving cleanup levels
- Evaluating hydraulic capture by the groundwater extraction wells
- Evaluating the performance of groundwater extraction and treatment systems, including monitoring of mass-removal efficiency and compliance with discharge standards
- Assessing the potential impact of contaminant plumes on the off-base drinking water supply wells
- Monitoring groundwater quality in the landfill areas (detection monitoring and evaluation monitoring)
- Monitoring groundwater quality in the zones where treated water is injected
- Monitoring surface water quality where treated groundwater is discharged

The *2013 Groundwater Monitoring Program Sampling Plan for the former Mather AFB, Sacramento County, California* (URS, 2013a) describes plans for the 2013 groundwater sampling program. The sampling plan identifies wells from which samples were to be collected in 2013, as well as specifying the analytical methods to evaluate the presence and extent of COCs. The sampling plan explains the rationale for the selected sample-collection frequencies (i.e., quarterly, semiannually, annually, biennially, or reserved [not sampled]) for each well.

Sections 3.0 through 7.0 provide specific descriptions of historical and current monitoring activities at the various sites at Mather.

1.3 HYDROGEOLOGIC SETTING

Mather is situated in the northern half of the California Great (Central) Valley physiographic province. The former base is situated on ancient stream terraces south of the American River. The topography of Mather consists of three relatively flat terraces that step progressively lower toward the American River to the north, with elevations on each decreasing gently toward the southwest.

Groundwater in the eastern Sacramento area occurs in Oligocene or younger geologic formations that include thick deposits of fluvial sands and gravels. In the area of Mather, these sediments are present to a depth of approximately 900 feet below ground surface (bgs). Groundwater within these geologic units receives recharge from surficial stream flow and rainfall. Possible significant local recharge sources include the American River, Mather Lake, Morrison Creek, drainage ditches, and numerous settling or recycling ponds and excavations associated with gravel and sand mining operations south (Teichert Aggregates Company [Teichert] and Granite Construction Company [Granite]) west of Mather. Other potential sources of recharge are the sanitary and storm sewer lines on and near Mather, and flood detention basins, one northeast of Mather (west of LF03) and one northwest (at the intersection of

Systems Parkway and Routier Road). Former settling ponds northeast of Mather were in use in conjunction with aggregate mining by RMC Lonestar in the 1980s and 1990s, and appear to have been a significant source of recharge during that period.

Three geologic units are recognized at Mather (from youngest to oldest): the Terrace Gravels, the Laguna Formation, and the Mehrten Formation (Figure 1-3). These units are described below.

Terrace Gravels. Terrace Gravels of Quaternary age comprise the uppermost geologic unit at Mather. Three distinct terraces were formed by the ancestral American River (from oldest to youngest): the Arroyo Seco Terrace, the “Middle” Terrace (informal name), and the Riverbank Terrace. The Arroyo Seco Terrace, at its highest elevation, underlies the southeastern third of Mather. The Middle Terrace is found northwest of the Arroyo Seco Terrace. The Riverbank Terrace occurs at the lowest elevation and underlies the northwestern half of Mather. The Terrace Gravels consist primarily of sandy to silty gravel deposited by the northwestward migration of the ancestral American River. The gravels are unconsolidated to weakly cemented, are unsaturated across Mather, and are capped by silt to sandy silt. The Terrace Gravels range in thickness from 5 to 60 feet (Montgomery Watson, 1999a). A soil horizon (locally up to 10 feet thick) has developed above the Terrace Gravels.

Laguna Formation. The Laguna Formation of Tertiary to Quaternary age underlies the Terrace Gravels across and west of Mather. The ancestral American River eroded its channel into the Laguna Formation, producing an unconformable contact between the Terrace Gravels and the Laguna Formation. The Laguna Formation consists of unconsolidated fluvial silts, sands, and gravels of Pliocene to Pleistocene Age. These sediments were deposited in a westward-thickening wedge by streams draining the Sierra Nevada Mountains(California Department of Water Resources, 1964). The coarse sediments of the Laguna Formation represent multiple episodes of channel deposition and are stacked (or aggraded) vertically; the silts and clays represent overbank sediments deposited during floods. The Laguna Formation is exposed east of Mather, where it is estimated to be at least 200 feet thick. Stratigraphic data collected during characterization efforts by MWH Americas, Inc. (MWH) suggest the Laguna Formation is more than 350 feet thick beneath portions of Mather. The formation has been informally subdivided into three parts designated as Upper, Middle, and Lower Laguna. The Upper Laguna locally underlies the Terrace Gravels and consists predominantly of silt with some interbedded sand. The Middle Laguna beneath the MBSA is characterized by sandy gravel with some sand and silty sand. The Lower Laguna consists predominantly of silt and clay with intermittent sand and gravel channel-fill deposits (Montgomery Watson, 1999a).

Mehrten Formation. The lowermost geologic unit identified at Mather is the late Tertiary Mehrten Formation, a primary source of potable water to water supply wells on and west of Mather. The Mehrten Formation is composed of fluvial, volcaniclastic sediments consisting primarily of black andesitic sand and interbeds of blue to brown clay. Locally, channels are filled with andesitic gravels. The Mehrten Formation forms a sedimentary wedge that dips and thickens to the west. The Mehrten Formation is approximately 200 feet thick in outcrops east of Mather and thickens westward in the subsurface to approximately 400 to 500 feet. The Mehrten Formation is locally an excellent source of groundwater (Montgomery Watson, 1999a). The contact between the top of the Mehrten Formation and the bottom of the Laguna Formation is generally not clearly defined. A transitional zone composed of both granitic Laguna sands and andesitic sands with a thickness of between 60 and 120 feet has been observed and is called the Laguna-Mehrten Transition (LMT) Zone (Shlemon, 1967; International Technology Corporation [IT Corp.], 1994).

Functional Hydrostratigraphy at Mather. Four general HSG units, A to D, have been designated at Mather. Each unit is described briefly below.

Because the water table slopes generally westward at a slightly lower angle than the westward dip of the HSG units, the water table beneath Mather transects Units A, B, and C progressively to the east (Figure 1-3, for the area north of the runways). Accordingly, the saturated thickness of these units decreases to the east. The water table occurs in Unit C near LF03 and LF04. In general, Units A, C, and D are finer-grained, with A and D containing some coarser-grained channel deposits; Unit B north of the runways has generally coarser-grained sediments. South of the runways there is finer-grained lithology at roughly the same depths as Unit B; however, the fine-grained aquifer materials in this general depth range at Site 7 and AC&W are referred to as Unit C based on the lithology, rather than the time-equivalent depositional history. Unit D and the Mehrten Formation are saturated beneath the entire Mather property.

- Unit A (the water table occurs in Unit A in the western portion of Mather and west of Mather) corresponds with the Upper Laguna Formation and consists primarily of overbank deposits of silt and fine sand, but some channel-fill sand and gravel is also present. The sediments are fairly continuous across Mather, but are now mostly above the water table. In most areas, overbank deposits of Unit A overlie coarse sediment of Unit B; but locally, channel deposits from the two units are continuous from above the water table to the bottom of Unit B (Montgomery Watson, 1999a).
- Unit B corresponds with the Middle Laguna Formation and consists of coarse channel-fill deposits of sandy gravel beneath the MBSA, extending west of Mather. The deposits range in thickness from roughly 20 to 60 feet and are first encountered at depths of roughly 120 feet bgs in the east and 180 feet bgs in the west. In areas south of the runway (i.e., Site 7), the coarse sediments of Unit B transition laterally to finer-grained Unit C sediments. Generally, along eastern and central portions of Mather, Unit A is above the water table or absent, and groundwater is first encountered in Unit B or Unit C. Unit B is the most transmissive unit of the Laguna Formation in areas north of the runway and in areas where the Middle Laguna Formation is characterized by channel-fill deposits of sandy gravel. In the western portions of Mather and extending west off the Base, Unit B is divided into two subunits, an upper channel subunit (Unit Bu) and a lower channel subunit (Unit B) (IT Corp., 1996). Unit Bu is only identified as a distinct unit where fine overbank deposits, referred to as the Unit Bu/B aquitard, are present. The Unit Bu/B aquitard is locally discontinuous; in some areas along the Mather boundary, the aquitard is not present and Units Bu and B are indistinguishable, allowing effective vertical hydraulic communication throughout the Middle Unit of the Laguna Formation (Montgomery Watson, 1999a). For this reason, the following sections group these subunits together for purposes of describing the nature and extent of COCs. Hydrogeologic Units Bu and B are important to the flow of groundwater and movement of COCs. Because of their high transmissivity, channel-fill deposits of Units Bu and B provide a primary pathway for the flow of contaminated groundwater beneath and beyond Mather (IT Corp., 1996). Some wells screened in Unit B are further identified as representing the shallower Unit B wells (Bs) or the deeper Unit B wells (Bd).
- Unit C is a portion of the Lower Laguna Formation and consists predominantly of silt and clay. Unit C is defined as the vertical interval between Unit B sands and gravels and the uppermost Unit D sands. Unit C may functionally constitute an aquitard because of its persistent extent and thickness and the significant differences in hydraulic head between units lying above and below it. Unit C as defined above is generally 10 to 50 feet thick throughout the area (Montgomery Watson, 1999a). The water table occurs in Unit C beneath relatively small portions of Mather near LF03, LF04, Site 7, and the AC&W site. Fine-grained sediments at the AC&W and Site 7 areas are also defined as Unit C based on lithology, although they are at depths equivalent to Unit B gravels north of the runways.

- Unit D is the deeper portion of the Lower Laguna Formation and extends from the top of the uppermost sandy channel below Unit B to the beginning of the LMT. Unit D consists primarily of fine overbank deposits of silt and clay and less frequent coarse channel deposits that are generally 20 to 40 feet thick. The unit behaves as a confined aquifer. Unit D channel deposits are encountered beneath Mather at approximately 220 to 300 feet bgs and are characterized by sands and silty sands, as opposed to the coarse sands and gravels of Unit B (Montgomery Watson, 1999a). Unit D sands are deeper to the west; as the base of Unit D is progressively deeper in that direction. Unit D is interpreted to be approximately 140 to 200 feet thick throughout the site. Volatile organic compound (VOC) contamination has been found in the upper to middle portions of Unit D.
- Underlying Unit D is a transition zone between the Laguna and Mehrten formations. The transition zone is characterized by materials derived from both andesitic and granitic source materials. The elevation of the top of the LMT Zone is interpreted to range from approximately 250 feet below mean sea level (msl) beneath the northwestern portion of Mather near the injection wells for the MBSA treatment system to approximately 380 feet below msl west of Mather near the Oaken Bucket water supply well (see Section 6.0 and Appendix B, Cross-Section E-E´ of the *Capture Zone Analysis [CZA], Main Base/SAC Area* report, [MWH, 2007a]). There are several deep-nested monitoring wells installed and/or monitored by Aerojet, Inc. in the upgradient portions of Mather, installed to monitor deep-level VOC and perchlorate contamination associated with the Inactive Rancho Cordova Test Site plumes with sources hydraulically upgradient of Mather. These wells extend through the Laguna Formation, through the LMT, and several are completed in the underlying Mehrten Formation. Based on the HSG zonal classification of these wells provided by ENSR Consulting and Engineering (former consultant to The Boeing Company [Boeing]), the LMT in the upgradient portions of Mather (beneath the Northeast Perimeter Landfills) is between 70 and 130 feet thick. This thickness is corroborated by the lithologic descriptions in one of the deepest wells at Mather, Mather Air Force Base (MAFB)-347, drilled to 530 feet and located on the northwest boundary of the MBSA Plume, southeast of the Oaken Bucket water supply well. Dark green to black andesitic grains are first noted on the log at approximately 375 feet bgs, which is interpreted to be the beginning of the LMT. Very dark gray andesitic sands are described beginning at about 490 feet depth. Assuming this is near the top of the Mehrten Formation, the LMT would be approximately 120 feet thick at this location.

Groundwater at Mather is generally encountered between 90 and 110 feet bgs in the Laguna Formation beneath the Riverbank Terrace deposits. The water table beneath Mather is encountered in Unit A, Unit B, or Unit C. The coarse sands and gravels of Units Bu and B of the Middle Laguna Formation are relatively transmissive and apparently continuous through the MBSA industrial areas, extending west beyond Mather. Consequently, these coarse sands and gravels are important to the flow of groundwater and the transport of COCs. Horizontal conductivity and transmissivity data for Units A, Bu, B, and D were compiled from wells installed at Mather and are listed below (Montgomery Watson, 2000a):

Hydrostratigraphic Unit	**Hydraulic Conductivity (feet/day)**	**Transmissivity (feet^2/day)**
A	1 to 290 (average 48)	3 to 3,378 (average 570)
Bu	2 to 222 (average 58)	8 to 5,550 (average 1,550)
B	2 to 350 (average 82)	24 to 14,000 (average 2,550)
D	1 to 182 (average 29)	70 to 8,000 (average 1,596)

Overall, groundwater beneath Mather flows westerly to southwesterly, conforming with the regional groundwater flow direction but also influenced by local groundwater pumping. More regional municipal and agricultural pumping across the basin has created three groundwater “cones of depression” northwest, southwest, and south of Mather. The Elk Grove cone of depression to the southwest influences the general groundwater flow direction at Mather (Montgomery Watson, 1999a).

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2.0 MATHER GROUNDWATER MONITORING PROGRAM

This section provides an overview of the field activities and sampling and gauging data collected during 2013 for the Mather groundwater monitoring program. More specific and detailed discussions are included in the sections on performance monitoring of the contaminant plumes and landfills (Sections 3.0 through 7.0). The *Second Quarter 2001 Basewide Groundwater Monitoring Report* (Montgomery Watson, 2001a) includes details of sampling protocols, except for the protocols for passive diffusion-bag sampling, which are included in Appendix B of the *2004 Groundwater Monitoring Program Evaluation Report* (MWH, 2005).

2.1 MONITORING ACTIVITIES

Groundwater monitoring at Mather includes groundwater gauging (measuring depths to groundwater) and sample collection and analysis. Table 2-1 presents the groundwater well reference list for Mather. Figure 2-1 shows the wells that are monitored in the program. Basewide gauging for potentiometric evaluation transitioned from quarterly to semiannually in 2007; therefore, depth-to-groundwater measurements were collected from each monitoring point in 2Q13 and 4Q13. Table 2-2 presents groundwater elevations calculated from depths to groundwater measured semiannually (2Q13 and 4Q13) in 2013. Groundwater elevations that are at or below the bottom of the screened interval are presented in bold, and are believed to result from water observed in the well sump that does not represent the potentiometric surface of the nearby aquifer. These values are not used in the assessment of potentiometric surfaces.

Contaminant concentrations and groundwater elevations are used to evaluate extraction well performance and capture, plume migration, and groundwater flow direction. Decisions concerning sampling frequency are based on the analytical results, as well as location of each well relative to the plume, potential receptors, and groundwater flow directions. The Groundwater Monitoring Decision Tree presents the sampling frequency decision logic (Figure 2-2). The *2006 Groundwater Monitoring Program Evaluation Report* presents a detailed discussion regarding the Groundwater Monitoring Decision Tree (MWH, 2007b). The Extraction Well Shutdown Decision Tree (Figure 2-3) provides the criteria used to determine when to take an extraction well off line. Monitoring activities planned for 2013 were presented in the *2013 Groundwater Monitoring Program Sampling Plan* (URS, 2013a).Analytical results are discussed in more detail in the sections on performance monitoring (Sections 3.0 through 7.0), and Appendix A presents the analytical results from samples collected over the last eight quarters (1Q12 to 4Q13).

2.1.1 First Quarter

Sample Collection. Samples were collected from 43 monitoring points (including monthly and/or quarterly sampling of monitoring wells, piezometers, extraction wells, and treatment systems) during 1Q13. All samples were collected as scheduled. Appendix E presents analytical data from this sampling event.

2.1.2 Second Quarter

Gauging. The depth to groundwater was gauged at 570 monitoring points (including monitoring wells, piezometers, extraction wells, and biovent wells with submerged screens) from 13 to 16 May 2013. Table 2-2 provides groundwater elevations and shows which wells were dry or inaccessible during the 2Q13 gauging event.

Sample Collection. The 2Q13 sampling event served as the annual and biennial sampling round at Mather and included wells that have biennial, annual, semiannual, quarterly, and monthly monitoring frequencies. Groundwater samples were collected from 340 monitoring points during 2Q13. All samples were collected as scheduled, with the following exceptions. Samples were not collected from the following dry wells in 2Q13: 7-PZ-37, ACW PZ-07, ACW PZ-08, ACW PZ-09, ACW PZ-10, MAFB-090, MAFB-105, MAFB-111, MAFB-112, MAFB-121, MABF-129, MAFB-130, MAFB-202, MAFB-206, MAFB-209, and MAFB-210. Samples also were not collected from MAFB-300 because it could not be accessed; MAFB-360 because of an obstruction in the well; OFB-08, OFB-09, OFB-31, OFB-46, and OFB-70 because the wells were not operational. Groundwater samples were collected from the following wells at the beginning of July 2013 (3Q13) as part of the 2Q13 sampling event: MAFB-042, MAFB-047, MAFB-062, MAFB-063, MAFB-104, MAFB-164, MAFB-168, MAFB-173, MAFB-175, MAFB-181, MAFB-200, MAFB-204, MAFB-215, MAFB-217, MAFB-220, MAFB-230, MAFB-243, MAFB-248, MAFB-266, MAFB-293, MAFB-312, MAFB-313, MAFB-314, MAFB-329, MAFB-362, MAFB-364B, MAFB-364D, MAFB-366D, MAFB-371C, MAFB-372B, MAFB-373C, MAFB-377, MAFB-382B, MAFB-387B, MAFB-420, MAFB-459D, MBS 19EW01, MBS EW-10B, MBS EW-11B, MBS EW-12B, MBS EW1ABu, MBS EW-1B, MBS EW-1Bu, MBS EW-1D, MBS EW2ABu, MBS EW-2AR, MBS EW-2B, MBS EW-2D, MBS EW-3B, MBS EW-3D, MBS EW4ABu, MBS EW-4B, MBS EW-4Bu, MBS EW5ABu, MBS EW-5B, MBS EW6ABu, MBS EW-6B, MBS EW-6D, MBS EW-7B, MBS EW-8B, MBS EW-9B, MBS PZ-13, MBS PZ-38, MBS PZ-39, and MBS PZ-50S. Appendix F presents analytical data from this sampling event.

2.1.3 Third Quarter

Sample Collection. Groundwater samples were collected from 43 monitoring points (including monthly and/or quarterly sampling of monitoring wells, piezometers, extraction wells, and treatment systems) during 3Q13. All samples were collected as scheduled. Appendix G presents analytical data from this sampling event.

2.1.4 Fourth Quarter

Gauging. The depth to groundwater was gauged at 550 monitoring points from 11 to 14 November 2013. Table 2-2 provides groundwater elevations and notes which wells were dry or inaccessible during the 4Q13 gauging event.

Sample Collection. Groundwater samples were collected from 50 monitoring points during 4Q13. All samples were collected as scheduled, with the following exceptions: MAFB-112, MAFB-129, MAFB-136, MAFB-140, MAFB-343, MAFB-403, which were dry, and OFB-49, which was off line. Appendix H presents analytical data from this sampling event.

2.2 EVALUATION OF POTENTIOMETRIC MONITORING AT MATHER

The following subsections identify and briefly discuss groundwater elevation trends across Mather. Groundwater elevation contour maps were prepared for the water table and the potentiometric surfaces of HSG units B and D in both 2Q13 and 4Q13 (Figures 2-4 through 2-6). These maps are used to interpret groundwater gradients and flow directions and to compare them to previous results. For reference, the HSG units are presented on Figure 1-3, which conceptualizes the stratigraphy north of the runways, from the shallowest saturated deposits (Unit A) through the deepest aquifer unit currently monitored at Mather (LMT Zone). Appendix B contains hydrographs of second quarter groundwater elevations at selected monitoring wells from 1990 through 2013. The plots in Appendix B depict the general regional decline in groundwater levels at the water table.

The objective of this section is to provide an overview of the potentiometric trends in groundwater across Mather. Separate sections of this report cover specific areas of interest (i.e., NEP, LF areas, MBSA

Plume, AC&W Plume, Site 7 Plume, and off-base supply wells) as needed to support evaluation of the remedial performance. Water level observations were collected within a 4-day period and observations in each specific area were collected within a 1- or 2-day period.

2.2.1 Water Table Unit

The water table at Mather occurs in Units A, B, and C. Figure 2-4 presents the 2Q13 and 4Q13 groundwater elevation contours for the water table. The average horizontal component of the groundwater gradient at the water table across Mather (outside the apparent effects of pumping) for 2Q12 and 4Q12 was approximately 0.002 feet per foot (ft/ft). The regional horizontal gradient in the water table unit is generally oriented toward the southwest. As in previous years, remedial pumping from the MBSA extraction wells at the water table and in shallow Unit B produces a large depression, or trough, in the potentiometric surface that extends roughly 7,000 to 8,000 feet along the northwestern Mather boundary, into which local groundwater flows are diverted. The flow direction and gradient for 4Q13 are generally consistent with those from 2Q13, while the groundwater elevations were approximately 2 feet lower in 4Q13 compared to 2Q13.

The overall regional decline in water table elevation apparently continued in 2013, despite a period of relative stability or slight increase in water levels observed from approximately 2005 through 2008 and the increase in basewide water table elevations of approximately three feet observed between 2010 and 2012 (Appendix B). The increasing trend was not attributed to changes in extraction well and treated discharge operations at Mather, but was likely caused by regional changes in the patterns of groundwater extraction and recharge. The continued overall water level declines (averaging approximately 0.70 foot per year over the past 20 years) have left many wells at Mather either dry or without enough water to evaluate groundwater quality. Appendix I contains a list of wells that were dry or unable to be sampled due to low water levels, during at least one gauging event during 2013, as well as notes on whether or not the well is necessary for the groundwater monitoring program.

2.2.2 Units B and C

Figure 2-5 shows groundwater potentiometric surface contours for Units B and C (combined) interpreted from water level measurements during 2Q13 and 4Q13. It should be noted that the water table occurs in Unit C in the AC&W and Site 7 areas and in landfill areas east of the MBSA Plume as shown on Figure 2-4. The Unit B/C surface includes potentiometric data from AC&W and landfill area wells with screens placed approximately 10 to 40 feet below the water table and excludes data from wells screened across the water table. These landfill and AC&W wells monitor the upper and lower portions, respectively, of the Unit C. The average horizontal component of the gradient in Unit B across Mather (outside the apparent effects of pumping) in both 2Q13 and 4Q13 was approximately 0.002 ft/ft. Groundwater in Units B and C flows south to southwest with local deviations near extraction wells associated with the Site 7, AC&W, and MBSA treatment systems. The overall regional decline in Unit B and Unit C groundwater elevations continued in 2013.

2.2.3 Unit D

Figure 2-6 presents the groundwater potentiometric surface contours for Unit D for 2Q13 and 4Q13. The average groundwater gradient in Unit D across Mather (apart from local cones of depression) was approximately 0.002 ft/ft. Groundwater in Unit D generally flows west and southwest, with local deflections toward extraction wells screened in Unit D as part of the MBSA Plume remedy. The westernmost cone of depression in Unit D water levels on Figure 2-6 represents the influence of the Moonbeam supply well on Unit D water levels. The overall regional decline in Unit D groundwater elevations continued in 2013.

2.3 MONITORING WELL AND TREATMENT SYSTEM MAINTENANCE

Maintenance tasks performed on groundwater monitoring wells and treatment systems during 2013 included routine maintenance and calibration of system components, replacement of malfunctioning parts, and security upgrades. Table 2-3 presents a list of groundwater monitoring well and treatment system maintenance performed during 2013.

2.4 GROUNDWATER WELL DECOMMISSIONING

The Groundwater Monitoring Decision Tree (Figure 2-2) and the Extraction Well Shutdown Decision Tree (Figure 2-3) provide criteria used to determine when a well is no longer useful for sampling or extraction, respectively, and, therefore, if not otherwise useful (i.e., for water level measurements), should be considered for decommissioning. When applicable, these wells are discussed in each specific groundwater plume section below. Table 2-4 presents a list of decommissioned or temporarily abandoned groundwater wells dating back to 1999.

Nineteen groundwater monitoring wells and two groundwater extraction wells were decommissioned in 2013. Details regarding the decommissioning were provided in the *Technical Memorandum for Decommissioning Select Site-wide Groundwater Monitoring and Extraction Wells* (URS, 2013b), which is included as Appendix J in this report.

2.5 PRODUCTION WELL STATUS

Tables 2-5 and 2-6 present the operating status and production volumes (in millions of gallons) for selected Sacramento County Water Agency and California American Water Company (Cal Am, formerly Citizens Utilities Company of California) production wells, respectively, in the vicinity of Mather (i.e., the area within the domain for the MBSA groundwater model) in 2013.

Based on narrative estimates received from Teichert in 2010 (Air Force Real Property Agency [AFRPA], 2010b) regarding groundwater pumping information for OFB-72 and OFB-85: OFB-72 pumps at 300 gallon per minute (gpm), 10 hours per day, 5 days per week; and OFB-85 pumps at 1,000 gpm, 16 hours per day, 5 days per week. However, based on field observations, these wells are not pumping as long or as frequently as reported by the well owner; therefore, these values are not believed to be accurate year-round.

3.0 LANDFILL POST-CLOSURE AND NORTHEAST PLUME MONITORING PROGRAMS

Evaluation of fourth quarter and annual 2013 data for the landfill post-closure and NEP monitoring programs is presented in the following sections. The landfill post-closure programs and the NEP monitoring program are described in the *2013 Groundwater Monitoring Program Sampling Plan* (URS, 2013a). Tables 3-1 through 3-3 summarize analytical detections in these programs.

3.1 REGULATORY AND STATUTORY FRAMEWORK FOR CURRENT MONITORING PROGRAMS

This section provides a description and framework for current monitoring programs. The status of the landfill post-closure and the NEP groundwater monitoring programs are described in Subsections 3.1.1 and 3.1.2, respectively. Subsection 3.1.3 provides a description of applicable or relevant and appropriate requirements (ARARs) for these programs, and how these ARARs affect the current and future status of the monitoring programs. The remedial action received United States Environmental Protection Agency (EPA) concurrence on the Operating Properly and Successfully (OPS) determination in 2011 (EPA, 2011).

3.1.1 Landfill Post-Closure Monitoring Programs

The Air Force conducts monitoring programs at three closed and capped landfill sites: LF03, LF04, and WP07. Remedial action construction activities have been completed at these sites, and the landfills contain waste contained under engineered caps constructed as part of the remedial action for each site. The groundwater component of the selected remedies for these closed landfills is post-closure monitoring under the Landfill Operable Unit (OU) for sites LF03 and LF04 (Air Force Base Conversion Agency [AFBCA], 1995), and under the Soils OU for Site WP07 as part of the remedy for Site 7/11 (AFBCA, 1996). Specific post-closure monitoring requirements for LF03 and LF04 are outlined in the *Closure and Post-Closure Maintenance Plan for the Landfill Operable Unit* (Montgomery Watson, 1996; MWH, 2010a) and for WP07 in the *Closure and Post-Closure Maintenance Plan for the Engineered Cap at Remedial Action Site 7* (Montgomery Watson, 1999b; MWH, 2010b). The original post-closure plans identified specific post-closure monitoring wells, and provided the initial sampling frequencies and analytical parameters for post-closure monitoring. Thereafter, changes for post-closure landfill monitoring were adjusted in annual sampling plans, with review by the remedial project managers, in order to respond to changing site conditions (e.g., declining water levels). The recommendations for these changes are presented in the annual groundwater monitoring reports or in the annual sampling plan documents. Changes to sampling frequencies for landfill wells are based on water quality results, including trends for VOCs and non-VOCs and comparison of non-VOC results to background concentrations. For non-VOCs, detections above any 95 percent upper tolerance limit (UTL) estimate of the upper background-range concentration may trigger sample frequency changes through an evaluation monitoring program unless results are judged to be essentially compatible with background and compatible with historical results. Sampling frequencies for VOC analysis are dictated by the Groundwater OU remedial actions for the NEP or Site 7 Plume, and by the detection monitoring requirements required by the remedies. Sampling frequencies are assessed and presented once per year in the annual Groundwater Monitoring Sampling Plan, although any non-VOC result indicating a new increase above the background range may trigger an immediate confirmation sample and/or evaluation program prior to the completion of the next sampling plan. Sampling frequencies for 2013 were presented in the *2013 Groundwater Monitoring Program Sampling Plan* (URS, 2013a).

During 2013, samples were collected from 14 of the 20 groundwater wells scheduled for sampling, and the data used to monitor post-closure performance of closed landfills LF03, LF04, and WP07 (Figure 2-1). Samples were not collected from LF03 monitoring wells MAFB-112 and MAFB-131, LF04 monitoring well MAFB-140, or WP07 monitoring wells 7-BV-13, 7-PZ-37, and 7-PZ-38P because the wells were dry throughout the year.

3.1.2 NEP Monitoring Program

Groundwater sampling in the NEP is required by the Mather Groundwater OU Record of Decision (ROD) (AFBCA, 1996). Sampling frequencies for 2013 for NEP wells were presented in the *2013 Groundwater Monitoring Program Sampling Plan* (URS, 2013a). The NEP consists primarily of tetrachloroethene (PCE) and cis-1,2-dichloroethene (DCE) and is in the northeastern portion of Mather (Figure 3-1). The extent of the plume with concentrations above ROD cleanup levels (5.0 micrograms per liter [µg/L] for PCE and 6.0 µg/L for cis-1,2-DCE [AFBCA, 1996]) is restricted to the landfill areas (Figures 2-1 and 3-1). The highest VOC concentrations in the NEP and the apparent source areas for the plume are also in the vicinity of LF03 and LF04. Accordingly, near-source NEP monitoring wells selected as part of the NEP monitoring program include many of the post-closure monitoring wells at LF03 and LF04.

3.1.3 ARARs – Groundwater Monitoring

ARARs cited in the RODs governing groundwater monitoring for both the NEP (AFBCA, 1996) and the landfill post-closure monitoring programs (AFBCA, 1995; AFBCA, 1996) include portions of Title 23, Division 3, Chapter 15, Article 5, of the California Code of Regulations, which describes groundwater monitoring programs for discharges of hazardous wastes to land. The applicable monitoring programs include detection, evaluation, and corrective action monitoring programs. Detection monitoring programs are designed to provide evidence of any new releases to groundwater of contaminants from the landfills. Evaluation monitoring programs are designed to provide data to characterize the nature and extent of any groundwater contamination throughout the zone affected by the release, and to provide data to support a determination of the need for corrective action. Corrective action monitoring programs are designed to provide data to evaluate the effectiveness of a prescribed remedial action program.

The landfills are known or suspected sources for VOC groundwater contamination for the NEP and the Site 7 Plume. Remedial actions have been selected for both of these VOC plumes. As such, the requirements for corrective action monitoring for VOCs in groundwater plumes beneath LF03, LF04, and WP07 are fulfilled under the monitoring requirements of the Groundwater OU remedial actions (AFBCA, 1996).

Title 40 of the Code of Federal Regulations (CFR) Part 258.51, which describes requirements for monitoring systems at municipal solid waste landfills, is also cited in the landfill ROD (AFBCA, 1995) as being an ARAR for LF04. Part 258.51 of 40 CFR specifies that groundwater monitoring systems must be installed that consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer that (1) represent the quality of background groundwater that has not been affected by leakage from a unit, and (2) represent the quality of groundwater passing the relevant point of compliance specified by the Director of an approved state under CFR Part 258.40(d), or at the waste management unit boundary in unapproved states. Neither the landfill ROD (AFBCA, 1995), nor the *Closure and Post-Closure Maintenance Plan for the Landfill Operable Unit* (Montgomery Watson, 1996; MWH, 2010a) specify a relevant point of compliance for water quality monitoring at the landfills, but in indicating the wells to be used initially for compliance monitoring compliance points were established. Compliance points for groundwater monitoring are typically and appropriately considered to be located on or near the line formed by the intersection of the vertical plane(s) passing through the downgradient landfill boundaries and the water table. Point-of-compliance wells are defined as water table wells installed along or nearest the downgradient landfill boundaries. In this case, these wells are downgradient landfill boundary wells that fulfill detection monitoring requirements at LF03, LF04, and WP07. These include boundary wells MAFB-111, MAFB-133 and

MAFB-398 at LF03, and MAFB-132 and MAFB-136 at LF04. At WP07, the boundary wells are MAFB-149, MAFB-284, and MAFB-413. MAFB-284 replaced 7-PZ-37 as a boundary well because 7-PZ-37 did not contain sufficient water for sampling purposes. Although screened in the perched unit, 7-PZ-37P and 7-BV-13 are also monitored to detect any landfill release that may reach the underlying groundwater. MAFB-424 is a Site 7 upgradient well sampled to provide information regarding background concentrations.

Monitoring for new VOC releases from landfills is required under detection monitoring requirements per the ARARs. Detection monitoring under the landfill post-closure monitoring programs at LF03 and LF04 began in 4Q96; post-closure monitoring at WP07 began in 2Q01. The Air Force recognizes that VOC corrective action monitoring under the NEP and WP07 monitoring programs does not eliminate the need for continued detection monitoring at a minimum frequency of at least once every 5 years for each required analyte in the designated compliance-boundary wells at LF03, LF04, and WP07 to monitor for potential new releases of VOCs. The requirements for VOC detection monitoring are fulfilled under the VOC monitoring program specified for downgradient landfill boundary wells at LF03, LF04, and WP07. Specifically, VOC monitoring in 2013 was conducted annually at LF03 boundary wells MAFB-111, MAFB-133 and MAFB-398 during 2Q13 or 4Q13. VOC monitoring in 2013 was conducted semiannually at LF04 boundary well MAFB-132, and annually at MAFB-136. VOC monitoring in 2013 was conducted annually at WP07 boundary wells MAFB-149, MAFB-284, and MAFB-413.

VOC monitoring near the landfills satisfies the dual requirements for detection and corrective action monitoring for VOCs. Detection and/or evaluation monitoring for non-VOCs is also part of the post-closure monitoring programs at LF03, LF04, and WP07. Non-VOCs (including inorganics) are discussed separately from VOCs in relation to post-closure monitoring requirements under the Chapter 15 ARARs. The monitoring objectives of the non-VOC post-closure monitoring programs at LF03, LF04, and WP07 include:

- Monitoring for potential new releases of non-VOCs to determine if the landfills are a source of non-VOC water quality impairment (detection monitoring)
- Evaluating the extent and migration of the contaminants for any contaminants detected above background values (evaluation monitoring)

Sections 3.3 and 3.4 discuss monitoring results for VOCs and non-VOCs. Appendix A presents analytical results from the last 2 years. Calculated upper background range concentrations for metals and general mineral constituents for Northeast Perimeter Landfills LF03 and LF04 are discussed in Section 3.4 and presented in Tables 3-4 and 3-5, respectively. Calculated upper background concentrations for metals in the groundwater near WP07 are also discussed in Section 3.4 and presented in Table 3-6.

3.2 HYDROGEOLOGIC CONCEPTUAL MODEL

This section presents a summary of the hydrogeologic conceptual model for the NEP, which is discussed in detail in the 2008 annual groundwater report (MWH, 2009a). Since approximately 2005, the water table beneath the landfills has been at or just below the base of the Middle Unit of the Laguna Formation (Unit B), within the overbank deposits of the Lower Unit of the Laguna Formation (Unit C). Since 2005, the only areas where VOCs in the NEP have exceeded cleanup levels are beneath and immediately downgradient of the landfills, where declining water levels have resulted in the occurrence of dissolved-phase contaminants being restricted to the very fine-grained overbank deposits of Unit C (Figures 3-2 and 3-3). These overbank deposits form an approximately 130-foot-thick aquitard between the Unit B sands and the uppermost transmissive channel deposits of the LMT zone. The aquitard limits the downward movement of contaminants through the Lower Unit of the Laguna Formation despite downward gradients in the upper portion of the saturated zone. Because of the relatively low hydraulic conductivity of the overbank deposits, significant or rapid lateral or vertical movement of the NEP aquifer cleanup level (ACL) volume is unlikely, and it is likely that little dilution will occur in the aquifer, possibly resulting in a smaller but potentially more highly concentrated plume through time. Limited downward migration likely is occurring because contaminants are not being transported laterally away from the area. Due to the low transmissivity of the aquifer materials, it is unlikely that the ACL plumes will migrate to the depth of the transmissive channel deposits of the LMT zone. This model appears to be validated by contaminant trends seen in the monitoring wells (Appendix C), the onset of increasing contaminant trends at MAFN-398C, and the documented changes in ACL plume extent since 1997 (Figure 3-4).

The overall groundwater gradient of the water table is from northeast to southwest; however, local groundwater gradient directions south of LF03 near MAFB-111 and MAFB-133, and south-southwest of LF04 near MAFB-112, MAFB-113, MAFB-141, and MAFB-399 appear to be consistently to the south. The overall orientation of the NEP has historically been northeast-southwest, despite the apparent southerly groundwater gradient near the landfills. Contaminant transport historically has been aligned with the southwesterly stratigraphic orientation of the lower gravel layer of Unit B in this area.

Previous investigations have concluded that, in this area of the base, specifically in the area immediately west of LF04, there are channelized sands that do not appear to have a strong hydraulic connection to wells screened at identical depths and within 200 feet of each other (Aeroenvironment Inc., 1987). Monitoring well MAFB-465, installed approximately 125 feet east of MAFB-132, had a 4Q13 groundwater elevation of approximately 4.5 feet lower than that measured in MAFB-132. The lower of the two screens in MAFB-132 (and the only portion that is submerged in MAFB-132) was interpreted as being installed in HSG Unit C. However, the groundwater elevations measured in this well are consistently higher than in those screened in HSG Unit C and the sands of HSG Unit B. The lithologic log for MAFB-132 indicates that the lower screen is in a clayey silt whereas the upper screen is in a silty sandy gravel. The log for MAFB-465 shows a similar lithologic pattern, but the clayey silt was not observed to be saturated during drilling. Water was not encountered at MAFB-465 until the borehole penetrated silt with no clay and sandy silt present below the clayey silt; these lithologies were not encountered during the drilling at MAFB-132. The relationship of the contact between HSG units B and C in this area is complex, but based on VOC distribution and concentrations, there appears to be a limited hydraulic connectivity between the two, or at least a common source of contaminated water, and a dominant south-to-southwest groundwater gradient at the water table.

3.3 VOC MONITORING RESULTS

Groundwater samples collected from wells that monitor the NEP and Site 7 are analyzed for VOCs by EPA Method SW8260B. The following subsections evaluate 2013 monitoring results for VOCs for those wells sampled under landfill post-closure monitoring requirements. These results, therefore, pertain to VOC contaminant distribution associated with the NEP (relevant to the LF03 and LF04 post-closure programs) or the Site 7 Plume (relevant to the WP07 post-closure program). Subsection 3.3.1 presents NEP results; Subsection 3.3.2 presents results for the post-closure monitoring programs for LF03, LF04, and WP07. NEP VOC results are presented on a table in Figure 3-1. Site 7 VOC results are shown on figures presented in Section 5.0, which also discusses the groundwater remediation of the Site 7 Plume.

3.3.1 NEP Monitoring – VOCs

PCE and cis-1,2-DCE are the two COCs identified in the Groundwater OU ROD for the NEP that have been consistently detected at concentrations greater than cleanup levels. The NEP PCE and cis-1,2-DCE isoconcentration contours for samples collected from NEP monitoring wells, together with the water table surface elevation contours as interpreted in 4Q13, are presented on Figure 3-1. Figures 3-2 and 3-3 also present the isoconcentration contours in cross-sectional view. Figure 3-4 shows the horizontal extent of the composite plume through time. Graphs depicting COC trends in NEP monitoring wells are included in Appendix C.

In 2013, PCE concentrations at or greater than the cleanup level of 5.0 µg/L were restricted to monitoring wells MAFB-132, MAFB-398C, and MAFB-465 (Figure 3-1), resulting in a smaller overall ACL plume area as compared with the 2012 ACL plume. The maximum PCE concentration detected in 2013 from any NEP monitoring well was 33 µg/L in well MAFB-132 in 2Q13. This concentration is less than the 2Q12 concentration of 35 µg/L, which was the historical maximum. In 2Q13, PCE was detected at a concentration exceeding the ACL (8.9 µg/L) in the sample collected from MAFB-398C after the 2Q12 concentration was less than the ACL for the first time since 2009. The 4Q13 sample collected from MAFB-465, a newer well installed upgradient of MAFB-132 in 4Q12, contained PCE at a concentration of 13 µg/L, less than the concentration of 22 µg/L detected in 4Q12. The concentration of PCE in deeper C zone well MAFB-400 remained less than the ACL at 4.1 µg/L. PCE concentrations have fluctuated near the cleanup level in wells MAFB-133 and MAFB-136 since approximately 4Q03 and were less than the ACL at both wells in 2013. The PCE concentration in MAFB-398 (3.1 µg/L) was less than the ACL of 5.0 µg/L after exceeding the ACL in 2Q12 for the first time since 2007. See Appendix C for a history of PCE concentrations in NEP wells.

The general distribution of cis-1,2-DCE has historically corresponded to the extent of PCE contamination in the NEP. Consistent with historical data, cis-1,2-DCE was detected at a concentration greater than the cleanup level of 6.0 µg/L at water table well MAFB-132 in 2013 (Figure 3-1). The maximum concentration of cis-1,2-DCE detected in 2013 from any NEP monitoring well was 41 µg/L in well MAFB-132 during 4Q13, which is also a new maximum concentration for the well. The 4Q13 sample collected from MAFB-465 contained cis-1,2-DCE at a concentration of 19 µg/L. The concentration of cis-1,2-DCE in deeper C zone well MAFB-400 remained less than the ACL at 2.3 µg/L. The cis-1,2-DCE concentration detected at Unit C well MAFB-398C in 2Q13 was 12 µg/L, a new maximum (the previous maximum was 9.9 µg/L in 2Q11). The Air Force will continue monitoring MAFB-398C, and if the current increasing trend continues through the next two annual sampling rounds (2Q14 and 2Q15), the installation of additional monitoring wells may be recommended in this area.

Other COCs identified in the Groundwater OU ROD for the NEP are carbon tetrachloride (CCl_4), chloromethane, and 1,2-dichloropropane (DCP). With the exception of one CCl_4 detection at MAFB-152 in 4Q98, these other COCs have not been detected exceeding ACLs since the remedy was selected in 1996. During 2Q13, 1,2-DCP was detected at estimated concentrations of 0.1 µg/L in well MAFB-132 and 1.0F µg/L in well MAFB-398C. The cleanup level for 1,2-DCP is 5.0 µg/L. Chloromethane and CCl_4 were not detected in the NEP monitoring wells during 2013. Though trichloroethene (TCE) is not a COC for the landfills, it was detected at a concentration of 7.0 µg/L in the 4Q13 sample from well MAFB-132 (a decrease from 7.7 µg/L in 2Q12) and at concentrations less than the maximum contaminant level (MCL) of 5 µg/L in all other wells.

3.3.2 Landfill Post-Closure Monitoring – VOCs

VOC concentrations from sample locations near the landfill sites at Mather are monitored both to satisfy requirements for performance monitoring for the Groundwater OU remedies (discussed in Section 3.3.1) and detection monitoring under the Landfill OU (LF03 and LF04) and Soil OU (WP07) remedies. The following subsections summarize notable VOC results for each of the three post-closure monitoring programs.

Landfill LF03. Appendix A, Table A-1, presents 2 years of analytical results for select VOCs reported in samples collected from wells that monitor LF03. The distribution of VOCs in the vicinity of LF03 is shown on Figure 3-1 and discussed in Subsection 3.3.1. PCE and cis-1,2-DCE were the only COCs with detections greater than the cleanup levels in LF03 post-closure monitoring wells during 2013. PCE and cis-1,2-DCE were detected at 8.9 and 12 µg/L, respectively, in well MAFB-398C during 2Q13. These concentrations are new maximum concentrations for this well. The concentration of cis-1,2-DCE in the 2Q13 sample from well MAFB-398C represents the fifth consecutive sample exceeding the ACL for cis-1,2-DCE in this deeper Unit C monitoring well. If this increasing trend continues through the next two annual sampling rounds (2Q14 and 2Q15), the installation of additional monitoring wells may be recommended in this area.

TCE was detected in MAFB-133, MAFB-398, and MAFB-398C at concentrations consistent with historical detections and less than the MCL of 5 µg/L. TCE is not a COC for the landfills, but low concentrations have historically been, and continue to be, detected in some NEP wells. The TCE detections may be the result of the breakdown of PCE, do not indicate a new release from the landfill, and do not require evaluation monitoring. PCE and cis-1,2-DCE concentrations should continue to be monitored as evidence of potentially continuing VOC contributions to the NEP from LF03.

Landfill LF04. Appendix A, Table A-1, presents 2 years of analytical results for select VOCs reported in samples collected from wells that monitor LF04. The distribution of VOCs in the vicinity of LF04 is illustrated on Figure 3-1 and discussed in Subsection 3.3.1. PCE and cis-1,2-DCE were the only COCs with detections greater than the cleanup levels in LF04 post-closure monitoring wells during 2013. The cis-1,2-DCE concentration in well MAFB-132 in 4Q13 (41 µg/L) is a new maximum for this well. The PCE concentration in 2Q13 (33 µg/L) was slightly less than the historical maximum concentration detected in 2Q12 (35 µg/L). PCE and cis-1,2-DCE were also detected at concentrations exceeding their ACLs at MAFB-465 (13 µg/L and 19 µg/L, respectively). The PCE and cis-1,2-DCE concentrations detected in MAFB-400 (downgradient from MAFB-132 and MAFB-465) remained less than their ACLs in 2013. The 2Q13 TCE concentration in well MAFB-132 (7.0 µg/L) exceeded the MCL (5 µg/L). TCE is not a COC for landfills, but low concentrations have historically been, and continue to be, detected in some NEP wells. The TCE detections may be the result of the breakdown of PCE, do not indicate a new release from the landfill, and do not require evaluation monitoring. PCE and cis-1,2-DCE concentrations should continue to be monitored as evidence of potentially continuing VOC contributions to the NEP from LF04.

Dry Wells and Data Quality Objectives. Continued overall decline in water levels has resulted in several NEP or landfill post-closure water table monitoring wells either becoming dry or anticipated to soon become dry. Some wells that had been dry for several quarters recovered in 2011 and 2012; however, many of these wells were dry again in 2013. Appendix I includes a list of wells that were dry during at least one gauging event in 2013. Assuming a resumption of the overall long-term decline in water levels, these wells are not expected to permanently recover. Upgradient NEP monitoring well MAFB-110 and upgradient LF03 monitoring well MAFB-130 are dry. Upgradient NEP monitoring well MAFB-075 had been dry but recovered in 4Q11. Wells MAFB-075 and MAFB-110 are currently on reserve sampling status. MAFB-130 is on a biennial sampling frequency and could not be sampled in 2013 as scheduled. None of these upgradient wells are used to define the NEP VOC plume boundaries, and sufficient historic data have been collected to determine background concentrations for the detection monitoring program. These wells have been evaluated and were determined not to require replacement.

Cross-gradient LF04 well MAFB-140 had approximately 0.4 foot of water in the screened interval during 2Q13 and 4Q13 and was not able to be sampled during 2013. MAFB-140 is no longer needed for evaluation monitoring for nickel and chromium and, is currently on reserve sampling status for VOCs, and has historically had only low-level detections of PCE at less than 1.0 µg/L. Downgradient LF03 well MAFB -112 was not sampled as it was dry during 2013. With respect to VOCs, MAFB-112 is currently on an annual sampling frequency and has not historically had VOC detections exceeding ACLs.

MAFB-112 is co-located with MAFB-399, a deeper Unit C monitoring well screened 25 feet lower than MAFB-112 in the finer-grained overbank deposits. VOC concentrations at MAFB-399 were less than ACLs in 2013. MAFB-111, MAFB-112, and MAFB-140 have been used to define the southern boundary of the NEP PCE plume and of these, only MAFB-111 is currently a viable well. However, based on the body of historical data, which includes more than 10 years of PCE detections less than the ACL in MAFB-112, it is not necessary to replace any of these wells for VOC monitoring. Section 3.4 further discusses these wells in relation to monitoring of non-VOCs.

Landfill WP07. Site 7 is on the southern side of Mather (Figure 1-2). Like the LF03 and LF04 post-closure programs, sampling for VOCs in these WP07 wells fulfills the dual requirement for detection monitoring for the landfill to identify any new releases, as well as corrective action monitoring for VOCs to monitor the effectiveness of the remedial action for the Site 7 Plume. VOC results for WP07 are discussed in Section 5.1, which describes the distribution of the Site 7 Plume; non-VOC results are described below.

3.4 NON-VOC MONITORING RESULTS

The following subsections present results for non-VOCs for sampling conducted under the post-closure monitoring programs. These subsections compare the observed concentrations of metals and general mineral constituents at LF03 and LF04, and metals at WP07, to the background ranges for these constituents to identify any potential releases from the landfills. The upper concentrations of the background range are estimated to be the calculated 95 percent UTL of background values for constituents in groundwater, and are calculated separately for the water table aquifer near the WP07 landfill and for the water table aquifer near the Northeast Perimeter landfills (LF03 and LF04).

3.4.1 Northeast Perimeter Landfills – Calculated Background Concentrations for Metals and General Mineral Constituents

Tables 3-4 and 3-5 present upper background concentrations from the water table aquifer near the Northeast Perimeter Landfills for metals and general mineral constituents, respectively. Background concentration estimates were calculated from wells upgradient of the Northeast Perimeter Landfills to evaluate whether the landfills are contributing significant amounts of these constituents to the groundwater. The background concentration statistics for metals were calculated using analytical results from samples collected from 4Q96 through 2Q05 and for general mineral constituents from 4Q96 through 4Q05. Background calculations were based on data from wells MAFB-005, MAFB-075, MAFB-110, and MAFB-131. These wells were selected because (1) they are located hydraulically upgradient of LF03 and LF04, (2) they had been sampled for Title 22 metals, and (3) historical data indicate they were not affected by contamination (MWH, 2005).

Based on persistent detections of chromium and/or nickel exceeding upper background levels in wells MAFB-112, MAFB-132, and MAFB-136, an evaluation monitoring program had been ongoing since 1Q06 at LF03 and LF04 for these two metals. Wells used in the evaluation monitoring program included MAFB-111, MAFB-112, MAFB-129, MAFB-132, MAFB-136, MAFB-140, MAFB-288, and MAFB-400.

The source of chromium and nickel in groundwater at LF03 and LF04 was thought to be corrosion of the stainless steel well screens, as was shown to be the case at LF06 (MWH, 2008, Appendix L), and not a result of a release from the landfills. To evaluate this hypothesis, a monitoring well (MAFB-465) constructed with a polyvinyl chloride (PVC) casing and screen was installed approximately 100 feet upgradient of MAFB-132 (Figure 3-1) and 100 feet downgradient of LF04 during 4Q12. This location was selected because it is expected to be outside the volume of water potentially affected by corrosion of the stainless steel screen at MAFB-132, but is in a similar location to monitor for any elevated nickel or chromium concentrations in the water table aquifer that may indicate contribution of contaminants in leachate from LF04.

Quarterly sample results from 4Q12 though 3Q13 support the hypothesis that the metals are associated with corrosion of stainless steel screens, with nickel and chromium being detected at concentrations less than their upper background levels in MAFB-465, while VOCs were detected at similar concentrations to samples collected from MAFB-132. The table below summarizes chromium and nickel analytical results for MAFB-132 and MAFB-465 during the first year of sampling at MAFB-465. These results indicate that the landfills are not the source of elevated nickel and chromium concentrations in MAFB-112, MAFB-132, and MAFB-136, and that continuation of the evaluation monitoring for Ni and Cr is no longer appropriate for the wells with stainless steel screens. The wells that comprised the evaluation monitoring program will revert to detection monitoring in 2014.

Nickel and Chromium Concentrations at MAFB-132 and MAFB-465

Location	Screen Material	Analyte	Upper Background Concentration (µg/L)	4Q12 Result (µg/L)	1Q13 Result (µg/L)	2Q13 Result (µg/L)	3Q13 Result (µg/L)
MAFB-132	Stainless Steel	Cr	10	31	NS	10	NS
		Ni	3.9	240	NS	230	NS
MAFB-465	PVC	Cr	10	ND	0.8	ND	0.62
		Ni	3.9	0.96	ND	2.8	1.6

Cr = chromium
MAFB = Mather Air Force Base
ND = not detected
Ni = nickel
NS = not sampled
PVC = polyvinyl chloride
µg/L = micrograms per liter
4Q12 = fourth quarter 2012

During 2Q13, cadmium was detected exceeding its calculated upper background concentration (0.6 µg/L) at monitoring wells MAFB-288 and MAFB-400 (at estimated concentrations of 1.1 and 1.3 µg/L, respectively). Samples were collected at these wells in 4Q13 to confirm the 2Q13 cadmium results. Cadmium was not detected in the confirmation samples collected from either location and these wells will continue to be used for detection monitoring.

No general mineral constituents detected in 2013 groundwater samples exceeded background concentrations.

3.4.2 Site 7 Landfill – Background Concentrations for Metals

MWH calculated statistics-based background concentrations for metals for WP07 (Table 3-6) to evaluate whether WP07 is contributing significant amounts of metals to groundwater (MWH, 2005). The background concentrations were calculated using the analytical results from the following water table wells: MAFB-148, MAFB-183 (abandoned), and MAFB-254 (abandoned) (Figure 5-1). These wells were selected as background wells because they are located hydraulically upgradient of WP07 and had been sampled for Title 22 metals.

As shown in Table 3-6, metals concentrations in samples collected from Site 7 wells in 2013 were less than their respective calculated upper background ranges.

Because the chemical profiles of the regional groundwater and perched-zone water are so dissimilar at Site 7, separate background values were calculated for each water type. Total dissolved solids (TDS) in the perched zone are higher than in the underlying regional groundwater, likely resulting from former infiltration of meteoric water through, or in contact with, the fill material in WP07. In 2013, results from the Site 7 detection monitoring samples from water table wells did not exceed water table background concentrations, and perched-zone concentrations did not exceed perched-zone background manganese concentrations.

3.5 CONCLUSIONS AND RECOMMENDATIONS FOR NEP AND LANDFILL MONITORING

Historical and recent data trends, current groundwater levels, and the hydrogeologic conceptual model indicate the VOC ACL volume is isolated to a few wells in close proximity to LF03 and LF04 and is not expected to expand laterally. COC concentrations are stable or decreasing at the plume edges (excluding the deep well, MAFB-398C, at LF03), but generally stable to increasing in the core of each ACL plume. Detections of cis-1,2-DCE and PCE exceeding the cleanup levels at Unit C well MAFB-398C indicate that chemicals have migrated to greater depths in Unit C. The 2012 analytical results indicated that the increasing concentration trends observed at MAFB-398C may have reversed. However, this was not confirmed with the 2013 monitoring results. Monitoring should continue to assess cis-1,2-DCE and PCE concentrations in the deeper part of Unit C though the next two annual sampling events.

Metal concentrations detected in samples collected from landfill wells were generally less than calculated upper background concentrations for each landfill. Sample results from MAFB-465, which was installed in 2012 with PVC casing and screen, support the hypothesis that the source of nickel and chromium concentrations exceeding background levels in water table wells is the result of corrosion of stainless steel well screens and, therefore, the evaluation monitoring for nickel and chromium is no longer appropriate.

The objectives for the NEP remedial action are being achieved. The current monitoring network of NEP wells is adequate to meet the corrective action monitoring requirements specified in the Groundwater OU ROD, with the exception of the contaminant concentrations at MAFB-398C. Specific recommendations for the NEP and landfill monitoring programs include:

- Discontinue sampling the evaluation monitoring wells for chromium and nickel as stated in the 2014 groundwater sampling plan (URS, 2013c) and return the evaluation wells to detection monitoring.
- Continue to monitor PCE and cis-1,2-DCE concentrations to maintain an understanding of plume extent and to assess near-source evidence of potentially continuing VOC contributions to the NEP from LF03 and LF04.
- Continue monitoring MAFB-398C, and if the increasing contaminant concentration trend continues through the next two annual sampling events (2Q14 and 2Q15), consider installing additional monitoring wells in this area.
- Conduct groundwater monitoring for 2014 in accordance with the *2014 Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

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4.0 AC&W REMEDIAL PERFORMANCE MONITORING PROGRAM

This section discusses the AC&W Plume using data collected through 4Q13. Table 4-1 lists VOC detections reported in 2013. TCE is the only COC for the AC&W Plume. Figure 4-1 shows locations of extraction and monitoring wells that are part of the AC&W groundwater extraction and treatment system, the surface-water discharge location, TCE isoconcentration contours, the water table surface, VOC results, and capture extents as interpreted in 4Q13. Figure 4-2 presents a hydrogeologic cross-section beneath the site.

4.1 AC&W PLUME REMEDIAL HISTORY

A detailed description of the AC&W Plume groundwater extraction and treatment system, as well as a full description of historical operations, was provided in the annual monitoring reports through 2007 (e.g., see Section 4.11 of the *Annual and Fourth Quarter 2007 Groundwater Monitoring Report* [MWH, 2008]). The system received EPA concurrence on the OPS finding in 1998 (EPA, 1998).

4.2 AC&W TREATMENT SYSTEM AND PLUME MONITORING

The performance of the AC&W Plume groundwater extraction and treatment system has been monitored since December 1994 to ensure compliance with discharge requirements and to ensure that remedial action objectives are met. The primary objectives of the remedial action as stated in the AC&W ROD (AFBCA, 1996) and Explanation of Significant Difference documents (AFBCA, 1997) are as follows:

- **Remediation:** Remove contaminant mass from the groundwater plume and remediate the plume to the ACL for TCE (5.0 µg/L).
- Comply with discharge requirements for the treated water.
- Comply with air-emission requirements.

Secondary objectives also have been adopted for the remedial action; these objectives are management strategies being used to meet the primary ROD objectives and include:

- **Capture:** Capture the contaminant plume and extract the contaminated groundwater for remediation.
- **System Performance:** Operate extraction wells to efficiently extract TCE.

Water quality in groundwater monitoring wells, extraction wells, and Mather Lake is monitored to evaluate the effects of extraction on the plume and of discharge to the receiving water at Mather Lake. The objectives of the water quality monitoring include:

- In conjunction with water level measurements, demonstrating that the zones of influence of the extraction wells are adequate to capture (at a minimum) the plume that exceeds 5.0 µg/L of TCE
- Monitoring remediation of the plume by monitoring changes in contaminant concentrations
- Removing contaminants from groundwater effectively and efficiently
- Demonstrating that treated groundwater does not exceed discharge standards and that its discharge does not degrade the receiving water quality
- Demonstrating compliance with air emissions standards

The following subsections describe monitoring activities and results for 2013.

4.2.1 Operations, Maintenance, and Monitoring of Extraction Wells and Groundwater Treatment Plant

The AC&W Plume extraction and treatment system in 2013 consisted of six active extraction wells and the treatment plant with one air stripper. All treated water was discharged to Mather Lake. From approximately 1998 to 2003, up to 50 gpm of the treated water was used by Sacramento County for irrigation near Mather Lake; such use was discontinued in 2003 when the treated water system was isolated from the irrigation system. The AC&W treatment system was inoperable from 29 December 2012 to 15 March 2013 due to vandalism.

Extraction Wells. Table 4-2 presents the quarterly average flow rates, TCE concentrations, and yearly mass removed for each of the active AC&W extraction wells. Between 2008 and 2013, TCE concentrations at groundwater extraction wells ACW EW-2 and ACW EW-3 were less than the ACL of 5.0 µg/L.

As part of ongoing efforts to optimize extraction at the AC&W Plume, extraction well ACW EW-2 was shut down on 20 September 2013. TCE concentrations had been less than the ACL at this location since 2Q08 and extraction was competing with effective extraction at ACW EW-3 and ACW EW-1. The first semiannual sample (4Q13) collected to monitor rebound at this location contained TCE at an estimated concentration of 0.3 µg/L. Semiannual samples will be collected through at least 2Q15.

Additional optimization efforts in 2013 included step-testing of extraction wells ACW AT-1, ACW AT-2, ACW EW-1 and ACW EW-3 and redevelopment of ACW AT-1 and ACW AT-2. After step-testing, the flow rate at ACW EW-1 was increased from 15 gpm to approximately 24 gpm.

Between 2002 and 2007, the concentration of TCE in extraction well ACW EW-6R decreased from 29 to 19 µg/L (Appendix C). After the flow rate at the well was increased from approximately 10 to 40 gpm in late August 2006, the TCE concentration increased to an estimated 32 µg/L during 2Q07, showed a decreasing trend thereafter to less than the ACL, reaching 4.3 µg/L in 2011 and decreasing each quarter in 2012 to 3.4 µg/L in 4Q12. Based on the extraction well decision logic presented on Figure 2-3, ACW EW-6R was shut down on 19 August 2013 and scheduled for semiannual sampling to monitor rebound. The first semiannual sample was collected in 4Q13 and contained TCE at a concentration exceeding the ACL (estimated at 8.7 µg/L). Based on this result and because ACW EW-6R is the farthest downgradient extraction well, extraction was resumed at this well on 5 December 2013. Semiannual sampling at ACW EW-6R is planned for 2014.

TCE concentrations at ACW EW-4 were less than the cleanup level from 2006 through 2008, and shut-down of this well was recommended in the *Annual and Fourth Quarter 2008 Groundwater Monitoring Report* (MWH, 2009a). ACW EW-4 was turned off in February 2010 and sampled during 1Q10, 2Q10, 4Q10, and 2Q11 to monitor for potential concentration rebound. No concentration rebound was observed. TCE was not detected in the 2Q11 sample, and the 2Q12 sample contained an estimated TCE concentration of 0.1 µg/L. ACW EW-5 was shut down in 2000, and TCE was not detected in samples collected from this well between 2002 and 2006, when sampling was discontinued. Based on historical data (Appendix C), ACW EW-4 and ACW EW-5 were decommissioned in 2013 (URS, 2013b).

Groundwater Treatment Plant. During 2013, air stripper influent water samples were collected each quarter for VOC and general minerals analysis. Water samples were collected from the air stripper effluent monthly (when the plant was operating) in 2013 for VOC analysis. Weekly system operation and maintenance activities were conducted to check system operations, download data collected by the treatment system computer, and maintain the system components. Appendix A provides analytical results for all sampling events. Table 4-2 presents the average flow rate at the treatment plant, quarterly influent sample results, and the total TCE mass removed in 2013. Influent treatment system TCE concentrations in 2013 were similar to those in 2012. When operating during 1Q13 and 2Q13, influent flow rates were similar to those in 2012. However, 3Q13 and 4Q13 flow rates were lower than in 2012 due to the shutdown of ACW EW-2 and ACW EW-6R (later restarted). The total VOC mass removed during the year, approximately 2.7 pounds, was similar to that removed during 2012.

The TCE mass removed by the pump-and-treat system is calculated to evaluate system performance. Figure 4-3 presents the total mass of TCE removed by the system since startup of continuous full-scale operation. The system removed approximately 479 pounds of TCE, from approximately 1.6 billion gallons of treated groundwater through 2013. The average air emission discharge rate and the maximum emission rate observed from the strippers for 2013 was 0.008 pound per day (lb/day) of TCE (Appendix D), well under the air emissions standard of 2 lbs/day for reactive organic compounds (ROCs) above which active emissions abatement would be required.

During 2013, the treatment system effluent complied with discharge standards. TCE was not detected in any of the AC&W system effluent samples (Table 4-3).

Mather Lake Discharge. Table 4-3 presents field parameters and total VOC concentrations for the receiving water at Mather Lake (ACW R-2) and the AC&W Plume treatment system effluent collected during quarterly and monthly sampling, respectively. TCE was not detected in any receiving water or effluent sample during 2013. Throughout 2013, monthly samples were collected from the treatment system effluent, which discharges to Mather Lake; these samples met the total VOC discharge treatment standards (total monthly median of 0.5 µg/L or less with any one sample not to exceed 1.0 µg/L). Chloroform was detected in the July 2013 sample collected from ACW R-2; however, chloroform was not detected in the corresponding treatment plant effluent sample and, therefore, did not originate from Mather. Additionally, chloroform is not a COC at AC&W. Appendix A includes the 2012 and 2013 sampling event results. Mather Lake was inspected monthly for any unusual conditions (algae blooms, turbidity, foams, etc.) resulting from the discharge of the treated groundwater. Monthly pH measurements were collected at several locations around Mather Lake to assess impact from the groundwater discharge. No unusual conditions resulting from groundwater discharge were observed in 2013.

4.2.2 Plume Monitoring and Distribution

In map view, Figure 4-1 shows the TCE distribution of the AC&W Plume based on 2013 analytical results in comparison to the plume distribution in 2012. Figure 4-2 presents a hydrogeologic cross-section beneath the site. Appendix C presents time-concentration graphs illustrating TCE concentrations for all AC&W well samples collected from 2000 through 2013.

A detailed description of the hydrologic conceptual model, HSG zones, historical source area investigations, and hypotheses on contaminant fate and transport, is provided in Subsection 4.4.1.1 of the *Annual and Fourth Quarter 2007 Groundwater Monitoring Report* (MWH, 2008). For additional historical information, refer to the 2007 annual report.

Regional groundwater flow at the AC&W Site is predominantly to the southwest, at a gradient of approximately 0.002 ft/ft during 4Q13. Flow lines deflect toward the operating extraction wells along the length of the plume (ACW AT-1, ACW AT-2, ACW EW-1, and ACW EW-3). Figure 4-1 depicts estimated capture zones for AC&W extraction wells during 4Q13, except at ACW EW-6R, which was shut down prior to the 4Q13 gauging event in November 2013 but restarted in December 2013. The capture zone shown around ACW EW-6R was determined based on 2Q13 groundwater elevation data

(Figure 2-5) and is included to depict the estimated capture zone after the well was restarted in December 2013 (the flow rate prior to shut down and after restart was approximately 26 gpm). The entire plume encompassed by the 5.0 µg/L TCE contour has been interpreted to lie within the capture radius of the extraction system (as indicated by groundwater flow directions interpreted from the potentiometric surface).

In 2013, the highest TCE concentrations were reported in the upgradient portion of the plume at and near extraction wells ACW AT-1 (23 µg/L) and ACW AT-2 (19 µg/L). These extraction wells and ACW EW-1 have had increasing TCE concentration trends since 2009. Additionally, monitoring locations ACW PZ-10C, MAFB-196, and MAFB-453 had new maximum concentrations in 2013. These increased concentrations caused the increased plume area depicted on Figure 4-1. The 2013 TCE ACL plume is still being captured based on capture zones; however, if the trend continues, additional monitoring wells may be necessary to define the ACL plume.

Concentration trends indicate that TCE concentrations in the downgradient portion of the plume have been generally stable or decreasing since approximately 2002 (Appendix C). However, the TCE concentration in the first rebound sample collected in 4Q13 from ACW EW-6R after it was shut down was greater than any TCE concentration detected at this well since 2008. However, this does not necessarily indicate an increase in concentration at that location because the extraction well was not operating at this time and not drawing in water from outside the plume boundaries that would have diluted the concentration in the well's groundwater as was the case for previous samples collected from the operating well.

Since 2006, the operation of Boeing extraction well EX-2 (located northeast of the AC&W Plume and screened in Unit D; Figure 4-2) has induced a downward gradient from Unit C to Unit D near the head of the plume, but sample results from AC&W Unit D wells (MAFB-067 and MAFB-068), as recently as 2Q13, have not indicated that measurable TCE is migrating downward.

Groundwater elevation trends are depicted in hydrographs generated from second quarter groundwater levels for water table wells across Mather (Appendix B). In 2013, the hydrographs for the AC&W Site continue to show the long-term trend of declining groundwater levels. In the AC&W area, many water table/Unit C monitoring wells have gone dry as the water table has dropped below the base of the screened interval, particularly at older wells installed in areas peripheral to the plume. Upgradient water table wells MAFB-401, MAFB-402, MAFB-403, and MAFB-408 have been periodically dry (or have not contained sufficient water for sampling) over the past 2 years. MAFB-401 was decommissioned in 2013 (URS, 2013b). The water table elevation in the upgradient portion of the AC&W plume has decreased approximately 9 feet since the startup of EX-2 in 2006, although this is consistent with the historic range of water level declines. None of the upgradient water table wells had detections of TCE concentrations exceeding the cleanup level in 2013. These data (and the historical data from these wells) establish the upgradient extent of the ACL plume. As such, the Air Force does not consider replacement wells necessary if and when these wells go dry.

4.3 CONCLUSIONS AND RECOMMENDATIONS

The AC&W groundwater extraction and treatment system successfully operated in 2013 to remove mass from the groundwater contaminant plume. TCE concentrations in the upgradient part of the plume are increasing or stable, while they are generally decreasing or stable in the downgradient part of the plume. Monitoring of TCE concentration trends in the upgradient part of the plume should continue, and if the increasing concentration trends continue through the next two annual sampling event (2Q14 and 2Q15), additional monitoring points and investigation may be recommended to define the plume and determine the cause for the increasing concentrations. Water level and concentration data from the AC&W wells have been used to define the TCE plume and to show that the plume is estimated to be captured by AC&W extraction wells (Figure 4-1). Progress is being made toward achieving the objectives of the remedial action at AC&W.

Flow rates and capture at all AC&W extraction wells will continue to be evaluated and possibly modified to more efficiently capture the downgradient part of the plume and remediate the upgradient part of the plume.

Groundwater monitoring for 2014 will be conducted in accordance with the *2014 Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

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5.0 SITE 7 REMEDIAL PERFORMANCE MONITORING PROGRAM

This section describes the Site 7 Plume based on monitoring data through 4Q13 and discusses the performance of the groundwater extraction and treatment system during 2013. Table 5-1 lists the Site 7 Plume COCs, their respective cleanup levels, and a summary of COC detections for 2013. A detailed discussion of the site conceptual model was most recently presented in the *Annual and Fourth Quarter 2007 Mather Groundwater Monitoring Report* (MWH, 2008). Figure 5-1 shows locations of extraction and monitoring wells that are part of the Site 7 groundwater extraction and treatment system, TCE and 1,2-dichloroethane (1,2-DCA) isoconcentration contours, the water table surface, VOC results, and estimated capture zones as interpreted in 4Q13. Figure 5-2 shows the VOC results for wells screened in the perched-water zone above the Site 7 groundwater plume. Hydrogeologic cross-sections are presented on Figures 5-3 and 5-4.

The VOC plume has migrated off Mather to the southwest, approximately 3,500 feet beyond the southern property boundary near the Site 7 disposal area (Figure 5-1). The interpreted downgradient extent of the plume is approximately 3,800 feet upgradient from the nearest water supply well (see Figure 2-1).

5.1 SITE 7 PLUME REMEDIAL HISTORY

The gravel borrow pit at Site 7 reportedly was used to dispose of wastes, including POL wastes, from 1953 to 1966. The gravel borrow pit was originally excavated to a depth of approximately 40 feet. Other wastes reportedly disposed include empty drums, sludge from plating shop dip tanks, absorbent sand used for cleaning oil and solvent spills, paint chips, waste paint and thinners, and at least one load of transformer oil that may have contained PCBs. The former disposal area was brought up to grade in 1998 and 1999 by receiving soils excavated from the West Ditch (Site 15), the South Ditch (Site 85), and from other IRP cleanup activities. An engineered cap was constructed over the former disposal area in 1999. VOCs in the vadose zone at Site 7 were initially remediated by vapor extraction until volatile contaminant concentrations had decreased to less than concentrations predicted to impact groundwater at concentrations exceeding ACLs. In April 2007, the vadose-zone treatment system was converted to active bioventing to address less volatile hydrocarbons. Passive bioventing replaced active bioventing in 2009 because sufficient oxygen was being maintained without active air injection. Because remaining vadose-zone contamination is not expected to significantly impact groundwater, a site closure report was submitted to permanently terminate vadose-zone remediation and the system and wells not in the groundwater or landfill gas monitoring program were dismantled and destroyed in 2012 (URS, 2012a).

The material disposed of into the gravel pit that is now the Site 7 landfill (WP07) is the suspected source for the Site 7 VOC groundwater plume. In 1995, the cancer risk to humans from exposure to maximum concentrations of COCs measured in Site 7 groundwater samples collected before remediation was estimated at 9.7×10^{-5} (AFBCA, 1996). Although the cancer risk was within the risk management range (10^{-6} to 10^{-4}), the Air Force opted to remediate the Site 7 Plume because the estimated risk was near the 1×10^{-4} threshold, and the plume extended beyond Mather in the direction of private drinking water wells.

The remedial action selected for the Site 7 Plume in the Groundwater OU ROD (AFBCA, 1996) is remediation by groundwater extraction, treatment by air stripping, and injection back into the aquifer through wells. Long-term monitoring and institutional controls on portions of Mather supplement active remediation. Post-closure groundwater monitoring is also required under the Soils OU for the closed Site 7 landfill WP07 (AFBCA, 1996). Section 3.0 discusses post-closure groundwater monitoring results for non-VOCs. Because a remedial action has been selected for the Site 7 Plume (groundwater extraction and treatment), corrective action monitoring is required under the Groundwater OU Remedial Action (AFBCA, 1996). Performance monitoring of the Site 7 Plume remedy is conducted as the corrective action monitoring program for VOCs for the selected remedy.

The treatment system was constructed according to the *Remedial Action Work Plan for Phase I Groundwater Remediation for Main Base/Strategic Air Command Industrial Area Plume and Groundwater Remediation of Site 7 Plume* (Montgomery Watson, 1997a) and the *Preliminary Engineering Report for Phase I Groundwater Remediation of Main Base/SAC Industrial Area Plume and Groundwater Remediation of Site 7 Plume* (Montgomery Watson, 1997b). The extraction system concept was modified during the remedial design process to reduce the number of extraction wells from three to two. Construction of the Site 7 treatment facility was completed in October 1998. Groundwater flow modeling in 1993 and 1994 to support the Focused Feasibility Study (FFS) (IT Corp., 1995) suggested that three wells cumulatively pumping 150 gpm would capture the Site 7 Plume. Subsequent plume characterization and modeling by MWH suggested that two extraction wells would suffice (MWH, 2008). Between 1998 and 2004, as gravel mining precluded full build-out, the system operated for three separate periods, each using a different extraction well. The following is a brief description of each period and other steps taken toward the current configuration.

Groundwater was extracted initially from only one well during the initial phase of the operation. However, this well (FFS-EW7-1) was destroyed in July 1999 because of gravel mining in the area.

One extraction well (7-EW-1) and seven performance monitoring wells (MAFB-370, MAFB-371C, MAFB-371D, MAFB-372B, MAFB-372D, MAFB-373C, and MAFB-373D) were installed across the leading edge of the Site 7 Plume during 4Q00. Startup of the extraction well and restart and prove-out of the treatment system began in early April 2001. However, Granite began mining in the vicinity of 7-EW-1 in July 2001 and, consequently, the conveyance piping was removed and the system taken offline on 27 July 2001 to accommodate mining in the area.

An additional six monitoring wells (MAFB-391, MAFB-392, MAFB-393, MAFB-394, MAFB-395, and MAFB-396), four piezometers (7-PZ-38P, 7-PZ-39B, 7-PZ-40B, and 7-PZ-41B), and one extraction well (7-EW-2) were installed during 1Q02. The treatment system was restarted in March 2002 with extraction from 7-EW-2. However, the treatment system was taken offline on 18 April 2003 to accommodate the aqueduct construction for rerouting Morrison Creek and other mining and reclamation activities.

The Site 7 groundwater extraction and treatment system resumed operation with the two remaining wells (7-EW-1 and 7-EW-2) in December 2006. Several monitoring wells at the toe of the Site 7 Plume (single-completion monitoring well MAFB-370, and dual-completion monitoring wells MAFB-371C and D, MAFB-372B and D, and MAFB-373C and D) were rehabilitated and sampled during 3Q06 and 4Q06 as part of system startup activities. Monitoring well rehabilitation and startup activities were described in Appendix M of the *Annual and Fourth Quarter 2006 Mather Groundwater Monitoring Report* (MWH, 2007c). MAFB-370 was decommissioned in September 2010 due to construction activities associated with gravel mining operations.

Groundwater monitoring well MAFB-464 was installed on 19 October 2011 to help delineate the southern (regionally downgradient) extent of the plume.

Figure 5-1 shows the groundwater extraction and treatment system for the Site 7 Plume, including extraction wells, injection wells, and conveyance piping. The system received EPA concurrence on the OPS finding in 2011 (EPA, 2011).

5.2 SITE 7 TREATMENT SYSTEM AND PLUME MONITORING

The performance of the Site 7 groundwater extraction and treatment system is monitored to ensure compliance with discharge requirements and to ensure that remedial action objectives are met. The primary objectives of the remedial action as stated in the Groundwater OU ROD (AFBCA, 1996) are as follows:

- **Remediation:** Remove contaminant mass from the groundwater plume and remediate the plume to the ACLs for all COCs (Table 5-1).
- Comply with discharge requirements for the treated water.
- Comply with air-emission requirements.

Secondary objectives have also been adopted for the remedial action; these objectives are management strategies being used to meet the primary ROD objectives and include:

- **Capture:** Capture the contaminant plume and extract the contaminated groundwater for remediation.
- **System Performance:** Operate extraction wells to efficiently extract COCs.

Water quality in groundwater monitoring wells and extraction wells is monitored to evaluate the effects of extraction on the plume. The water quality monitoring objectives include:

- In conjunction with water level measurements, demonstrating that the zones of influence of the extraction wells are adequate to capture (at a minimum) the COC plume(s) that exceeds ACL
- Monitoring remediation of the plume by monitoring changes in contaminant concentrations
- Removing contaminants from groundwater effectively and efficiently
- Demonstrating that treated groundwater does not exceed discharge standards and that its discharge does not degrade the receiving water quality
- Demonstrating compliance with air emissions standards

The following subsections describe monitoring activities and results for 2013.

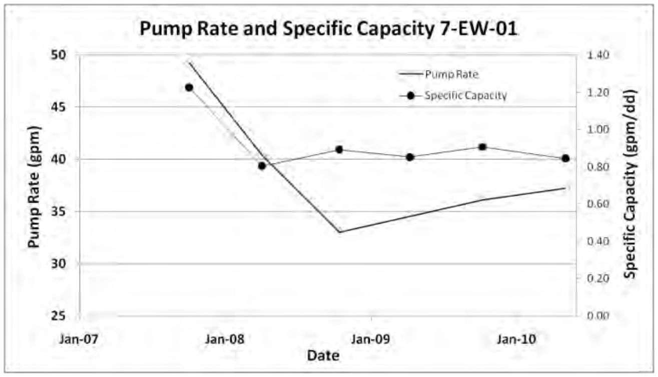
5.2.1 Operations, Maintenance, and Monitoring of Extraction Wells, Groundwater Treatment Plant, and Injection Wells

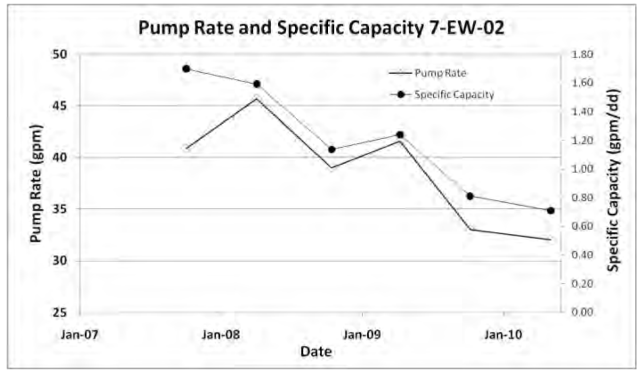
The Site 7 Plume groundwater treatment system, including the extraction wells, injection wells, and the treatment plant, operated in general accordance with procedures described in the *Operations and Maintenance Manual for the Groundwater Extraction and Treatment System for the Site 7 Plume* (MWH, 2010c).

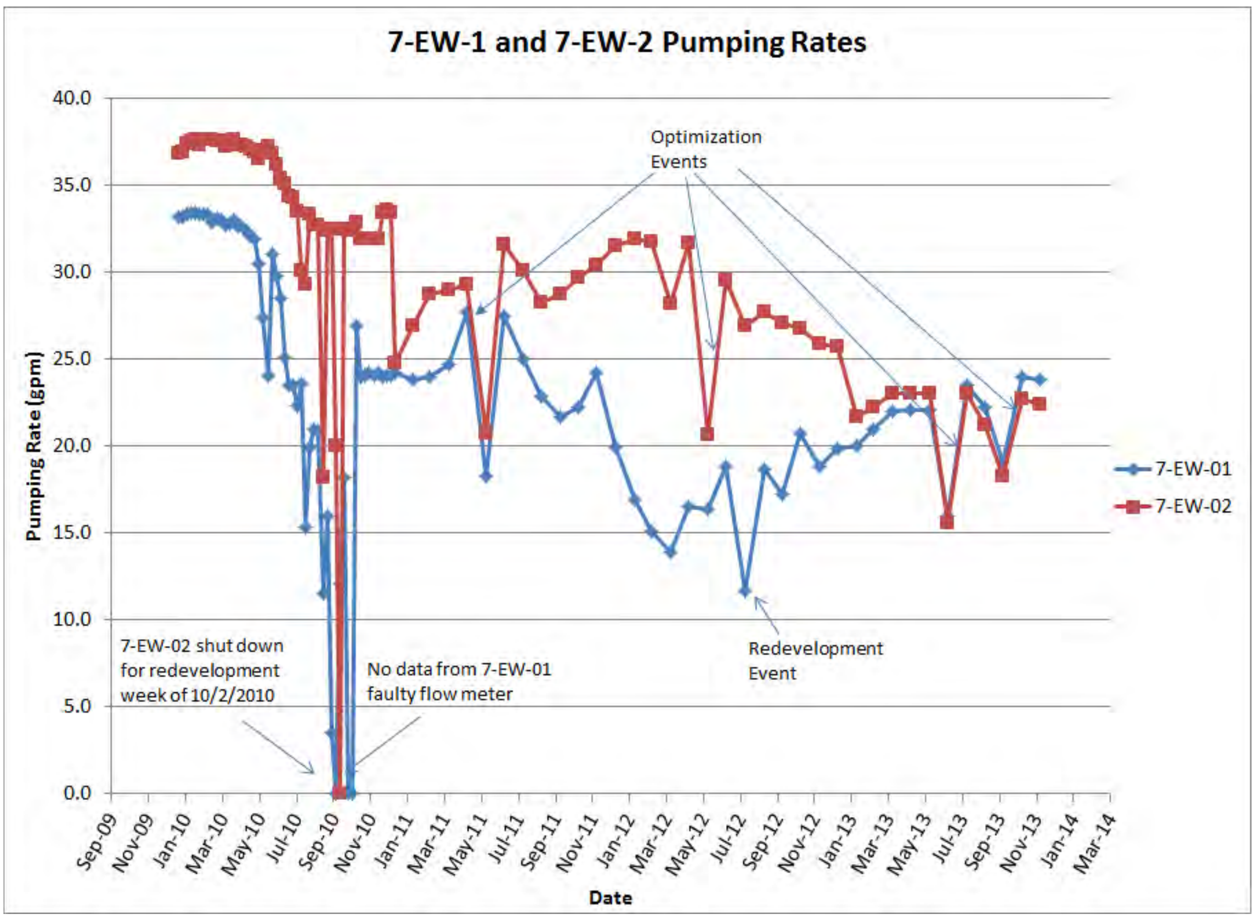
Extraction Wells. Samples collected from the wellheads of groundwater extraction wells 7-EW-1 and 7-EW-2 were analyzed for VOCs, total petroleum hydrocarbons as gasoline (TPH-g), and general minerals. Table 5-2 presents quarterly average flow rates and the estimated 2013 mass removed for each of the active Site 7 extraction wells.

Extraction rates for the Site 7 system extraction wells were approximately 50 gpm (the original design rate for each well) during initial periods of operation from 2001 to 2003. However, pumping rates have decreased due to excessive drawdown, likely caused by a combination of declining regional water levels and declining specific capacity (gpm per foot of drawdown) of the wells as discussed below. Quarterly average extraction rates in 2013 were between approximately 21 and 22 gpm for 7-EW-1 and between approximately 20 and 22 gpm for 7-EW-2 (see graphs below).

Extraction rates for the period between late 2007 and December 2013 are shown on the graphs below to illustrate current performance of the wells and to assess the need for additional well maintenance.







Extraction well 7-EW-1 was redeveloped in July of 2008 following a sharp decline in the sustainable pumping rate. Following redevelopment, the flow rate for 7-EW-1 remained relatively stable through 2011 but began declining again in 2012. 7-EW-1 was redeveloped in July 2012, and the flow rate increased to approximately 21 gpm.

The specific capacity of extraction well 7-EW-2 declined approximately 60 percent, from 1.7 to 0.71 gpm per foot of drawdown, from 4Q07 to 2Q10. 7-EW-2 was redeveloped in October 2010 and, as shown on the graph on the previous page, the well's flow rate did not significantly increase. To increase the flow rate at 7-EW-2 and to maximize capture of the plume in this location, URS redeveloped the well and performed step-rate tests to determine well efficiency during 4Q13. The results of the optimization appeared to have been successful in increasing the extraction rate to greater than 30 gpm. However, the rate decreased to approximately 26 gpm by the end of 2012.

Optimization efforts conducted in 2013 stabilized flow rates at 7-EW-1 and 7-EW-2 to approximately 23 to 24 gpm. The toe of the Site 7 TCE plume has receded over the last few years and currently, 7-EW-1 appears to be capturing the entire downgradient portion of the Site 7 Plume, as demonstrated by the estimated capture zones plotted on Figure 5-1.

Groundwater Treatment Plant. Table 5-2 presents the quarterly average flow rates, quarterly cumulative VOC influent concentrations, and total mass removed in 2013 by the Site 7 treatment plant. Water samples were collected quarterly from the air stripper influent for VOCs, total petroleum hydrocarbons (TPH), and general minerals analysis. Water samples were collected monthly from the air stripper effluent for VOCs and quarterly for TPH-g, TPH as diesel (TPH-d), and general minerals analysis. Appendix A includes results from all sampling events in 2012 and 2013. During 2013, the treatment system effluent complied with discharge standards.

Figure 5-5 illustrates the cumulative volume of water treated and VOC mass removed by the Site 7 treatment system, as well as the historical system influent cumulative VOC concentration. In 2013, the system removed approximately 2.8 pounds of VOCs from 27,354,047 gallons of groundwater. Since 2007, the rate of COC removal has gradually decreased as the plume continues to be remediated. From 1998 through 2013, the system has removed approximately 58.5 pounds of VOCs from 273 million gallons of water. The average air emission discharge rate from the stripper for 2013 was 0.007 lb/day and the maximum was 0.009 lb/day (Appendix D), well under the ROC air emission standard of 10 lbs/day.

Injection Wells. In 2013, all four injection wells received treated water from the groundwater treatment system. Table 5-2 presents quarterly average flow rates for each injection well. The capacity of the injection wells is sufficient to accommodate all of the treated groundwater. Groundwater sample collection is not required for the injection wells because the injected water is treated to discharge treatment standards, as verified by the analytical data from the air stripper effluent samples.

5.2.2 Plume Monitoring and Distribution

The Site 7 Plume consists of a groundwater plume with TCE and 1,2-DCA concentrations greater than ACLs and PCE concentrations near its ACL. In map view, Figure 5-1 shows the distribution of the Site 7 Plume based on 2013 analytical results in comparison to the plume distribution in 2012. The cis-1,2-DCE concentration at MAFB-041 (4.9 μg/L) decreased to less than the ACL (6.0 μg/L) for the first time in 2Q12 and remained less than the ACL in the 2Q13 sample (3.1 μg/L); therefore, no cis-1-,2-DCE plume is depicted on Figure 5-1. A potential residual source for the groundwater plume is migration of contaminants from a perched-water zone beneath the engineered landfill cap with TCE and occasionally, 1,2-DCA, vinyl chloride, TPH-d, and benzene detected at concentrations greater than the cleanup levels for the underlying groundwater plume. Extraction of the perched water to provide source control has been deemed impractical (MWH, 2009b). Figure 5-2 shows isoconcentration contours for contamination in the perched zone in 2013 compared to 2012. Figures 5-3 and 5-4 illustrate the conceptual model of the site in two hydrogeologic cross-sections.

Perched Zone. During 2013, groundwater samples were collected from all nine wells screened in the perched zone at Site 7. TCE and 1,2-DCA concentrations exceeded the ACL in the 2Q13 samples collected from 7-BV-02 (16 µg/L and 4.0 µg/L, respectively) and have been relatively stable since 2009. TCE concentrations at 7-BV-08 also exceeded the ACL in 2Q13 (12 µg/L), where TCE concentrations have been increasing since 2009 and 1,2-DCA has never been detected. The TCE detection at 7-PZ-37P in 2Q13 was less than the ACL, after the 2012 sample concentration exceeded the ACL. Although the lateral extent of the perched zone has not been defined, the extent of contamination in the perched zone is defined. Monitoring of the perched zone will continue to help evaluate whether the perched water may be a significant source of contaminants to the underlying water table in the future.

Groundwater Plume. TCE and 1,2-DCA concentrations exceeding cleanup levels continued to be reported during 2013 at MAFB-041, which is downgradient from the landfill cap and approximately 350 feet downgradient from the base boundary (Figure 5-1). In 2013, TCE concentrations in MAFB-041 decreased to a level similar to the levels reported in 2005 through 2007, after peaking at a concentration of 48 µg/L in 2010 (Appendix C). TCE and 1,2-DCA were also detected at concentrations greater than ACLs and previous historical maximum concentrations in 2Q13 at MAFB-284, which is between the Site 7 landfill and MAFB-041 (Figure 5-1).

In 2013, TCE concentrations greater than the ACL continued to be detected in the mid-plume area in extraction well 7-EW-2 (16 µg/L) and adjacent monitoring well MAFB-394 (16 µg/L). The estimated capture zone based on the potentiometric contours shown on Figure 5-1 suggests that the entire plume width in the vicinity of 7-EW-2 is captured.

MAFB-446 was installed during 2008 in the mid-plume area between 7-EW-2 and 7-EW-1, along the axis of the plume to gauge remedial progress between the extraction wells. In samples collected at MAFB-446 in 2013, TCE, PCE, and 1,2-DCA were detected at concentrations less than those detected in the previous sample collected in 2Q11. While the TCE concentration exceeds the ACL, PCE, and 1,2-DCA concentrations are less than ACLs, indicating that the mid-plume area is being remediated by extraction at 7-EW-1 and 7-EW-2. MAFB-444 constrains the ACL volume to the east, and historic results at MAFB-300, most recently in 2012, constrain the ACL volume to the west in the mid-plume area.

Groundwater extraction well 7-EW-1 continued to effectively remove mass from the toe of the plume during 2013. Since 7-EW-1 was returned to service in late 2006, TCE concentrations at MAFB-372B, downgradient from 7-EW-1, have decreased from greater than the ACL to less than the ACL (Appendix C). Two groundwater monitoring wells were installed in 2008 near the toe of the plume. MAFB-445 was installed in Unit B approximately 750 feet east of 7-EW-1 to help define the eastern edge of the plume toe. No COCs have been detected exceeding their cleanup levels in the seven samples collected at MAFB-445 since the well was installed in 2008. MAFB-448 was installed southeast of MAFB-372B in an attempt to bound the downgradient extent of the plume. However, the 2008 baseline sample for MAFB-448 contained TCE exceeding the cleanup level (7.1 µg/L). The TCE concentration at MAFB-448 increased to a maximum concentration of 9.0 µg/L in 4Q09 but decreased to a concentration less than the ACL in the 2Q12 sample and remained less than the ACL in the 2Q13 sample. Monitoring well MAFB-464 was installed in 2011 downgradient of the southern extent of the Site 7 plume in order to better define the downgradient edge of the plume. The maximum historical TCE concentration at this location was 1.1 µg/L in 4Q12. Based on 4Q13 groundwater elevation data, the downgradient portion of the ACL plume lies within the 7-EW-1 capture zone.

To fulfill mining reclamation requirements, an emergent marsh (outlined on Figure 5-1) has been constructed by Granite west of the Site 7 Plume toe with some overlap of the plume margin. The marsh encompasses approximately 40 acres and has water depths of up to approximately 3 feet. The surface impoundment of water began circa 2005 and is believed to have resulted in increased recharge of the underlying water table. Recharge may continue to increase as the wetland contains water for longer periods of time each year, and an increase in the size of a groundwater mound associated with the recharge may change groundwater flow near the southwestern portion of the Site 7 plume. Groundwater elevations in nearby wells MAFB-371C, MAFB-373C, and MAFB-447, were used to evaluate the impacts of the marsh on groundwater levels. The groundwater elevations spiked in 4Q10, when water levels were higher than in 4Q09 by approximately 1.5 to 3 feet; however, this groundwater elevation increase was measured in nearly all wells gauged in the vicinity and, therefore, is not likely representative of groundwater elevation being effected by infiltration from the marsh. During 2011 and 2012, the water table returned to a level similar to 2009, suggesting that the marsh had not significantly changed hydraulic gradient. Suspect water depths were observed in well MAFB-373C starting in 2Q13. The 2Q13 groundwater elevation at MAFB-373C (at the southeast corner of the marsh) was 42 feet higher relative to the 4Q12 elevation. The 4Q13 elevation was 16 feet lower than the 2Q13 elevation, but confirmed the higher-than-expected water elevation. The extreme variability in elevation measurements at MAFB-373C, no unexpected variability observed in other Site 7 wells, and proximity to the emergent marsh, suggested that this well may have been compromised and required inspection. The Air Force has determined that water is entering the well though the casing above the water table. Because this location is not needed for plume monitoring or water level gauging, it is recommended that the well be decommissioned, with care taken to not disturb the deeper completion at this location (MAFB-373D). Due to the infiltration of water into the well casing, data collected from MAFB-373C (gauging and analytical) during 2013 were not used in groundwater or plume interpretations presented in this report. The Air Force will continue to review groundwater elevation data in this area.

5.3 CONCLUSIONS AND RECOMMENDATIONS

The Site 7 groundwater extraction and treatment system successfully operated in 2013 to remove mass from the groundwater contaminant plume. Contaminant concentrations in Site 7 wells are generally decreasing or stable. Water level and concentration data from the Site 7 wells have been used to define the COC plume and to show that the plume is estimated to be captured by extraction wells 7-EW-1 and 7-EW-2 (Figure 5-1). Progress is being made toward achieving the objectives of the remedial action at Site 7.

The emergent marsh constructed west of the Site 7 plume toe has not changed the groundwater hydraulic gradient in this area. MAFB-373C (at the southeast corner of the marsh) is damaged and water is flowing into the casing from above the water table. MAFB-373C should be decommissioned.

Flow rates at Site 7 extraction wells should continue to be monitored and redevelopment undertaken as necessary to maintain capture at the toe of the ACL plume.

Groundwater monitoring for 2014 will be conducted in accordance with the *2014 Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

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6.0 MAIN BASE/SAC AREA REMEDIAL PERFORMANCE MONITORING PROGRAM

This section discusses the remediation history of the MBSA Plume and describes the groundwater extraction and treatment system. Additionally, this section discusses the performance monitoring for the groundwater extraction and treatment system for the MBSA Plume for 2013. Table 6-1 includes COCs and their respective cleanup levels identified for the MBSA Plume, and a summary of COC detections for 2013. Figure 6-1 shows the extraction wells, injection wells, and layout of the treatment system. Figures 6-2 through 6-11 show the extents of the COC ACL plumes in the different HSGs. Figure 6-12 illustrates the cumulative volume of water treated and VOC mass removed by the MBSA treatment system, as well as historical system influent concentrations. Figures 6-13 and 6-14 show hydrogeologic cross-sections beneath the site.

The MBSA Plume is approximately 3.4 miles long and consists of commingled plumes. Contaminants have been found in monitoring wells in three HSG units of the Laguna Formation as deep as 260 feet bgs (at MAFB-318 and MAFB-435, which have screens reaching approximately 185 feet below the water table). The deepest contamination occurs below the northwest base boundary and continues downgradient to the southwest.

6.1 MAIN BASE/SAC AREA PLUME REMEDIAL HISTORY

The remedial action for the MBSA Plume as outlined in the *Superfund Record of Decision: Soil Operable Unit Sites and Groundwater Operable Unit Plumes* (AFBCA, 1996), includes groundwater extraction, air stripping with off-gas treatment (carbon adsorption) as necessary, injection, and groundwater monitoring. The remedial system has been operating since 1998.

Construction of Phase I of the groundwater extraction and treatment system for the MBSA Plume was completed in early spring 1998. The MBSA system began continuous operation in April 1998. Phase I of groundwater remediation of the MBSA Plume emphasized mass removal from “hot spots” in the MBSA Plume that were identified on Mather property. A hot spot is defined as an area having contaminant concentrations at least 10 times the ACL for one or more contaminants. Twelve extraction wells were initially installed and operated as part of the Phase I MBSA treatment system.

As part of the initial Phase II/III system expansion, completed in January 2000, 12 additional extraction wells were installed and connected to the system. The Phase II wells were installed in hot spots west of Mather, and the Phase III extraction wells were installed to more aggressively remediate groundwater near source areas at Mather, particularly at Sites 23C and 57. During 2Q01, three additional Phase III extraction wells (EW-6ABu, EW-7B, and EW-3D) were installed; these three extraction wells were brought online during 3Q01.

During 2Q02, eight extraction wells (MBS EW-4Bu, MBS EW-4D, MBS EW-5D, MBS EW-6D, MBS EW-9B, MBS EW-10B, MBS EW-11B, and MBS EW-12AB) were installed as part of the Phase IV expansion of the MBSA remedial action. The objective of the Phase IV expansion was to augment the existing extraction system, primarily in the off-base portions of the MBSA Plume, and to increase the area of hydraulic capture by the extraction wells installed under the previous three groundwater remediation phases. The Phase IV extraction wells were brought online in September 2002.

A supplemental Phase IV extraction well, MBS EW-12B, was installed in September 2004 to capture the toe of the plume in Unit B. Startup for EW-12B occurred in May 2005 but damage to the sump in the bottom of the well prevented the well from running continuously. A packer was installed in the sump to keep sediment from entering the screen from deeper in the sump, and the well was redeveloped in early December 2005. With the exception of routine maintenance issues, EW-12B has run continuously since that time. Due to decreasing water levels, MBS EW-1A and MBS EW-2A were replaced by two slightly deeper new wells, MBS EW-7ABu and MBS EW-2AR, which began operation in March 2005.

Extraction well MBS EW-13BuB was installed near the intersection of Happy Lane and Kiefer Boulevard in late 2007 and began operation in April 2008. The purpose of MBS EW-13BuB was to address the known extent of the Southwest Lobe of the MBSA Plume that was beyond the capture of the other extraction wells. MBS EW-13BuB has screened intervals in the Bu, and at two depths in Unit B, called shallow (Bs) and deep (Bd) Unit B. Where Unit Bu exists, it is distinct from and lies above the rest of Unit B. The terms Bs and Bd are relative terms within Unit B and are not distinct HSG units.

A CZA for the plume was completed in 2007 (MWH, 2007a) and a focused CZA for TCE in the Southwest Lobe was completed in 2009 (MWH, 2009b).

Figure 6-1 shows the layout of the groundwater extraction and treatment system as of December 2013 including extraction wells, injection wells, and underground piping. The system received EPA concurrence on the OPS finding in 2011 (EPA, 2011).

6.2 MAIN BASE/SAC AREA TREATMENT SYSTEM AND PLUME MONITORING

The performance of the MBSA Plume groundwater extraction and treatment system is monitored to ensure compliance with discharge requirements and to ensure that remedial action objectives are met. The primary objectives of the remedial action as stated in the MBSA ROD (AFRPA, 1996) are as follows:

- **Remediation:** Remove contaminant mass from the groundwater plume and remediate the plume to the ACLs for all COCs (Table 6-1).
- Comply with discharge requirements for the treated water.
- Comply with air-emission requirements.

Secondary objectives have also been adopted for the remedial action; these objectives are management strategies being used to meet the primary ROD objectives and include:

- **Capture:** Capture the contaminant plume and extract the contaminated groundwater for remediation.
- **System Performance:** Operate extraction wells to efficiently extract COCs.

Water quality in groundwater monitoring wells, extraction wells, and Morrison Creek is monitored to evaluate the effects of extraction on the plume and of discharge to the West Drainage Canal on the downstream receiving water in Morrison Creek. The water quality monitoring objectives include:

- In conjunction with water level measurements, demonstrating that the zones of influence of the extraction wells are adequate to capture (at a minimum) the plume that exceeds 5.0 µg/L of TCE
- Monitoring remediation of the plume by monitoring changes in contaminant concentrations
- Removing contaminants from groundwater effectively and efficiently
- Demonstrating that treated groundwater does not exceed discharge standards and that its discharge does not degrade the receiving water quality
- Demonstrating compliance with air emissions standards

The MBSA Plume monitoring network in 2013 consisted of groundwater monitoring wells and piezometers completed in HSG Units A, B, and D in addition to 27 operating extraction wells, 4 injection wells, and the treatment plant.

The following subsections describe monitoring activities and results for 2013.

6.2.1 Operations, Maintenance, and Monitoring of Extraction Wells, Groundwater Treatment Plant, and Injection Wells

The MBSA Plume groundwater treatment system, including extraction wells, injection wells, and the treatment plant, operated in accordance with procedures described in the *Revision to the Final Addendum to the Operations and Maintenance Manual for the Groundwater Extraction and Treatment System for the Main Base/SAC Area Plume* (MWH, 2010d).

Extraction Wells. During 2013, monitoring of the extraction wells included sampling and semiannual depth-to-groundwater measurements from the following 27 active MBSA extraction wells, organized by HSG position:

- Extraction wells screened across the water table and Unit Bu: EW-1ABu, EW-1Bu, EW-2AR, EW-2ABu, EW-4ABu, EW-4Bu, EW-5ABu, EW-7ABu, and EW-39ABuB
- HSG Unit Bu/B: EW-1B, EW-2B, EW-3B, EW-4B, EW-5B, EW-6B, EW-7B, EW-9B, EW-10B, EW-11B, EW-12B, and EW-13BuB
- HSG Unit D: EW-1D, EW-2D, EW-3D, EW-4D, EW-5D, and EW-6D

As recommended in the *Annual and Fourth Quarter 2012 Mather Groundwater Monitoring Program Report* (URS, 2013d), EW-7ABu was restarted on 8 May 2013, due to the COC concentrations detected at MAFB-405 in 2012.

The following wells, shown on Figure 6-1, are no longer used for extraction and did not operate in 2013: 39EW02, 19EW01, EW-1A (replaced by EW-7ABu), EW-2A (replaced by EW-2AR), EW-3A, EW-3Bu, EW-4A, EW-5A, EW-6ABu, EW-8B, and EW-12AB. Semiannual depth-to-groundwater measurements were collected from these non-operating extraction wells in 2013.

Groundwater samples collected from the extraction wells during 2013 were analyzed for VOCs by EPA Method SW8260B; this method includes analyses for benzene, toluene, ethylbenzene, and total xylenes for selected extraction wells (in accordance with procedures described in the 2013 sampling plan) that are located near known or suspected fuel source areas (Montgomery Watson, 2001b). Table 6-1 presents VOC data for the MBSA monitoring program. Table 6-2 presents the quarterly average flow rate and volatile COC concentration and the yearly mass removed for each extraction well.

Groundwater Treatment Plant. Table 6-2 presents the quarterly average flow rate, quarterly influent concentrations, and total mass removed for 2013 by the MBSA treatment plant. Water samples were collected quarterly from the air stripper influent and analyzed for VOCs, TPH, general minerals, and metals. Water samples were collected monthly in 2013 from the air stripper effluent for VOCs and quarterly for TPH, general minerals, and metals analyses. Table 6-3 presents data for effluent and discharge monitoring. Appendix A includes results from all sampling events in 2012 and 2013.

During 2013, the treatment system effluent complied with discharge standards. Figure 6-12 shows the cumulative VOC mass removed, volume of water treated, and total VOC influent concentrations for the MBSA treatment plant. During 2013, the Mather MBSA GWTP extracted and treated approximately

1,483 gpm of groundwater containing VOCs, although the plant has a design treatment capacity of 2,200 gpm. Through 2013, the plant has treated more than 10.5 billion gallons of water and has removed approximately 3,859 pounds of VOCs since operation began in 1998. The average air emission discharge rate from the strippers for 2013 was 0.13 lb/day of ROCs plus PCE (which is not regulated as an ROC), and the maximum observed emission rate was 0.15 lb/day of ROCs plus PCE (Appendix D), well under the air ROC emission standard of 10 lbs/day.

Injection Wells. In 2013, all four injection wells received treated water from the groundwater treatment system. Table 6-2 presents quarterly average flow rates for each injection well. The injection capacity of the system has diminished and is no longer sufficient to handle the entire volume of treated groundwater. To address this problem, the Air Force has begun a gradual transition to surface water discharge (see next paragraph). Water sample collection is not required from the injection wells because the injected water is treated to discharge treatment standards, as verified by the analytical data from the air stripper effluent samples.

Surface Water Discharge. Prior to September 2011, all extracted and treated groundwater was injected into the aquifer using injection wells, except for water used for irrigation of road side landscaping at Mather by Sacramento County. Due to injection well operations and maintenance issues that have restricted well capacity, the Air Force proposed discharging treated groundwater into the nearby West Ditch (West Drainage Canal) that ultimately flows to Morrison Creek, a tributary to the Sacramento River.

The Central Valley Regional Water Quality Control Board (CVWB) issued a Notice of Applicability (NOA) Limited Threat Waste Discharge Requirements Order No. R5-2008-0082-013 in August 2011 authorizing a monthly average discharge of up to 500 gpm (monthly average) to the West Drainage Canal (CVWB, 2011). In 2012, the Air Force notified CVWB of its intent to increase the monthly average rate to up to 1,000 gpm to maintain optimal remediation system performance, because the surface water discharge over the last year increased from approximately 300 to 500 gpm to keep the groundwater treatment system running with all desired extraction wells and to avoid treatment plant shutdowns (URS, 2012b). After two temporary increases in discharge were granted by the CVWB, a revised NOA (Waste Discharge Requirement [WDR] Order No. R5-2013-0073) was adopted by the CVWB on 21 June 2013 (CVWB, 2013) and the discharge limit was increased to the requested 1,000 gpm. WDR Order No. R5-2008-0082-013 was rescinded.

During 4Q13, an average of approximately 566 gpm was discharged to Morrison Creek via the West Drainage Canal (also known as West Ditch). Table 6-3 presents data for receiving water monitoring.

6.2.2 Plume Monitoring and Distribution

Changes in plume distributions for the water table/Unit Bu and HSG Units B and D are discussed below. Figures 6-2 through 6-11 show the distribution of the COC ACL plumes by HSG based on 2013 analytical results in comparison to the plume distribution in 2012. Table 6-1 provides a 2013 analytical detection summary for wells that monitor the MBSA Plume. Appendix C presents time-concentration plots of TCE, PCE, and CCl_4 for the monitored wells through 4Q13.

Water Table. Figures 6-2 through 6-5 illustrate the distribution of TCE, PCE, CCl_4, and 1,1-DCE, respectively, in wells screened at or just below the water table as well as estimated capture zones based on 4Q13 water table elevation contours. These compounds have been the only COCs detected at concentrations exceeding cleanup levels in the water table portion of the MBSA Plume in recent years. The wells shown on these figures are screened in Units A, Bu, and B. Plume boundaries are generally consistent with previous years, and do not extend beyond Mather boundaries.

In the portion of the plume farthest in the regionally upgradient direction (to the northeast), TCE was the only COC detected at a concentration above its cleanup level in one monitoring well (MAFB-405) (Figure 6-2). At MAFB-405, TCE was detected at a concentration of 12 µg/L, but the concentration of CCl_4 decreased from 0.8 µg/ L in 2011, above its ACL, to 0.4 µg/L, below the ACL in 2013 (Figure 6-4). MBS EW-7ABu was restarted on 8 May 2013 to help capture COC mass in the area of MAFB-405.

The TCE hot spot downgradient of Site 57 has decreased in extent based on data collected in 2013. The concentration at MBS EW-1ABu was 23 µg/L (less than the hot spot concentration), reducing the hot spot to one well, MAFB-420. MAFB-420 had a 2013 TCE concentration of 55 µg/L (slightly greater than the hot spot concentration); TCE concentrations have been decreasing at this well since 2007.

With the exception of the reduction in PCE concentration to less than the ACL at MBS EW-4B, eliminating the most downgradient water table section of the ACL plume, no changes in the distribution of the PCE ACL plume in the water table aquifer were observed between 2012 and 2013 (Figure 6-3).

The CCl_4 concentration detected in 2011 at MAFB-207 (43 µg/L) may have been anomalous, because CCl_4 concentrations had been decreasing at this well (less than 5 µg/L in 2009) and the concentration detected in 2013 was 2 µg/L. However, the CCl_4 concentration at MAFB-264 (approximately 300 feet north of MAFB-207) in 2013 was 9.1 µg/L (a new maximum). These results caused changes to the shape and size of the CCl_4 hot spot area near Site 57 (Figure 6-4).

In 2013, 1,1-DCE was not detected exceeding the ACL of 6.0 µg/L in any samples collected from water table wells in the MBSA. In 2012, the 1,1-DCE ACL plume was defined by one well (MAFB-418); however, in 2013, the 1,1-DCE concentration at that well was less than the ACL (Figure 6-5).

The downgradient parts of the TCE and CCl_4 water table plumes exceeding ACLs are only partially captured by extraction wells in these areas (Figures 6-2 and 6-4). However, the concentrations in groundwater in these areas are near the ACLs and it is likely that this contamination is captured downgradient at base-boundary extraction well MBS EW-13BuB. The capture zone for the water table (Unit Bu) at MBS EW-13BuB is not shown on the water table figures because this well is also screened in Unit B. However, Figure 6-6 shows the estimated capture zone for MBS EW-13BuB in Unit B, and Figure 6-2 shows deflected water table contours in this area, supporting the assessment that MBS EW-13BuB is likely capturing the portions of water table plumes that are not captured by MBS EW-1Bu and MBS EW-4Bu.

Dry Water Table Wells and Data Quality Objectives. The continued overall decline in water levels has left many former water table wells dry and no longer useful for evaluating groundwater quality. Appendix I contains a list of wells that were dry during at least one of the gauging events in 2013. Assuming continued decline of water levels, these wells are not expected to permanently recover. The primary water quality data objectives for in-plume water table wells are to monitor progress toward cleanup and/or to serve as performance monitoring wells for adjacent extraction wells where applicable. Objectives for remaining wells include delineation of the boundaries of the ACL plumes. Areas of the MBSA Plume where dry water table wells may be impacting these data quality objectives and where selected dry wells potentially may need to be replaced are discussed below.

The first area includes six dry wells located southwest of the Site 57 area and west of the former base boundary. The dry wells have included MAFB-121, MAFB-122, MAFB-123, MAFB-124, MAFB-159, and MBS PZ-59. With the exception of MAFB-121, these wells are either on reserved or not sampled sampling status. Two of the wells, MAFB-123 and MAFB-159, are co-located with upper Unit B wells (MAFB-176 and MAFB-174, respectively) that have been reclassified as water table wells as water levels have declined. These formerly submerged Unit B wells have replaced wells MAFB-123 and MAFB-159 to monitor the upper portion of the saturated aquifer.

MAFB-121 had TCE at concentrations between 5 and 10 µg/L before the well went dry in 2008. This well is co-located with Unit B well MAFB-173, but there is approximately 37 feet of vertical separation between the base of the screen for MAFB-121 (-14.8 feet msl) and the top of the screen for MAFB-173 (-51.3 feet msl). TCE at MAFB-173 has remained less than the ACL during the time MAFB-121 has been dry. MAFB-121 is near the margin of the interpreted capture zone of MBS EW-1Bu and MBS EW-4Bu, and based on the 2013 plume distribution, it is not necessary to replace this well.

The second area includes in-plume wells and wells defining the plume boundary in the Site 57 Area. The occasionally dry water table wells and piezometers include MAFB-201, MAFB-202, MAFB-203, MAFB-204, MAFB-206, MAFB-207, MAFB-208, MAFB-209, MAFB-210, MBS PZ-01, and MBS PZ-04. Of these wells, only MAFB-203, MAFB-208, and MAFB-209 were dry in 2013 (during the 4Q13 gauging event) and with the exception of MAFB-202, all of the wells contained sufficient water for sampling in 2Q13. Piezometers MBS PZ-01 and PZ-04 are used to gauge water levels in the vicinity of MBS EW-2AR, MBS EW-2ABu, MBS EW-3A, MBS EW-4ABu, and MBS EW-5ABu. All of these wells were designated as in-plume, plume-boundary, or extraction well performance monitoring wells when water levels were approximately 20 feet higher than 2013 levels. As water levels have declined, the Air Force has installed three replacement water table wells; MAFB-417 (replacing MAFB-208), MAFB-418 (replacing former piezometer MBS PZ-03), and MAFB-420 (replacing former piezometer MBS PZ-02). It is important to note that all of the remaining wells, MAFB-201, MAFB-202, MAFB-203, MAFB-204, MAFB-206, MAFB-207, MAFB-209, and MAFB-210 are co-located with Unit B wells (MAFB-216, MAFB-217, MAFB-218, MAFB-219, MAFB-223, MAFB-224, MAFB-225, and MAFB-226, respectively).

The Unit B wells in this area are designed to monitor water quality in coarse sand and gravels of the Unit B channel-fill deposits, whereas the water table wells are designed to monitor finer-grained silt and silty sand of the overlying Unit A overbank deposits. The declining water table is encroaching upon the stratigraphic boundary between Unit A and Unit B. An important consideration in replacing water table wells in this area is whether a replacement well is needed or possible in Unit A, or whether a replacement well is appropriate in uppermost Unit B, depending on the thickness of any remaining saturated portion of Unit A. Among the higher priority wells to consider for replacement are in-plume wells MAFB-207 and MAFB-210 (for TCE and CCl_4; Figures 6-2 and 6-4, respectively), and downgradient boundary defining wells MAFB-201 and MAFB-202. Well MAFB-201 also serves as a performance monitoring well for nearby extraction well MBS EW-1ABu. Based on a stratigraphic analysis, there appears to be an adequate thickness remaining in the saturated interval of Unit A beneath wells MAFB-202, MAFB-207, and MAFB-210 to consider a viable replacement well within Unit A. A replacement well for MAFB-201 within Unit A is not practical as the current water table elevation is within 1 to 2 feet of the boundary between Unit A and Unit B at this location. All of these wells, with the exception of MAFB-202, contained sufficient water for sampling in 2013 and are not being considered for replacement in 2014. An attempt will be made in 2014 to collect a sample from MAFB-202. The Air Force will continue to evaluate groundwater elevations in this area and replacement of these wells will be re-evaluated in the 2014 annual groundwater monitoring report.

The third area includes seven dry wells in upgradient areas north (or in the case of MAFB-033, just west) of the Site 18/59 area in the general vicinity of the intersection of Macready Avenue and Mather Boulevard. The dry wells in this area include MAFB-033, MAFB-092, MAFB-160, MAFB-188, MAFB-212, and MAFB-244. Well MAFB-033 has been used to monitor a portion of the upgradient TCE plume. TCE concentrations in this well declined from a high of 240 µg/L in 4Q01 to 6.9 µg/L in 2Q09. In 2Q13, there was sufficient water to sample well MAFB-033, and the TCE concentration in the sample collected was 15 µg/L. This well is an in-plume well with respect to TCE (Figure 6-2) and also serves as a boundary well for the PCE and CCl_4 plumes (Figure 6-3 and Figure 6-4). Well MAFB-033 is also co-located with an underlying Unit B well (MAFB-101). Well MAFB-160 already has been replaced with wells MAFB-428 and MAFB-439, and well MAFB-188 already has been replaced by well MAFB-419. MAFB-212 is currently on reserve sampling status. Historic contaminant concentrations in well MAFB-212 have been less than cleanup levels since the 2Q02 sampling event. In addition, this well is co-located with Unit B well MAFB-228 and a replacement well for MAFB-212 would encroach within approximately 15 vertical feet of the underlying Unit B well. As such, a replacement well is not being considered for well MAFB-212. The remaining hydraulically upgradient wells in this group, MAFB-092, MAFB-187, and MAFB-244 are neither in-plume nor plume boundary defining wells for the water table with respect to the VOC plume. Well MAFB-092 is not necessary to monitor TPH related to releases from Site 29, as MAFB-314 and MAFB-419 are adequate for this monitoring, and MAFB-187 was decommissioned in 2013 (URS, 2013b).

Unit B. Figures 6-6 through 6-8 illustrate the distribution of TCE, PCE, and CCl_4, respectively, in Unit B, as well as estimated capture zones based on 4Q13 Unit B elevation contours. These figures do not include data from wells that are screened across the water table. TCE, PCE, and CCl_4 were the only COCs detected at concentrations greater than cleanup levels during 2013 in Unit B of the MBSA Plume. Notable results from 2013 are discussed below.

The interpreted extent of the Unit B TCE ACL plume for 2013 is smaller than in 2012 (Figure 6-6). Two wells that contained TCE exceeding the ACL in 2011 or 2012 (biennial sampling period) contained TCE at concentrations less than the ACL in 2013. These wells are MAFB-458Bd (a boundary well at the toe of the Southwest Lobe) and MAFB-423B (a boundary well on the east side of the plume).

The interpreted extent of the Unit B PCE ACL plume (Figure 6-7) for 2013 is smaller than in 2012 because PCE concentrations decreased at several wells. These monitoring wells and extraction wells are now all plume boundary wells (formerly within the plume, now outside or at the boundary) and include: MAFB-218, MAFB-231, MAFB-363, MAFB-429Bs, MBS EW-1B, MBS EW-5B, MBS EW-7B, and MBS PZ-42D.

The interpreted extent of the Unit B CCl_4 ACL plume for 2013 is substantially smaller than in 2012 (Figure 6-8). Several wells that contained CCl_4 exceeding the ACL in 2011 or 2012 (biennial sampling period) contained CCl_4 at concentrations equal to or less than the ACL in 2013. These wells are all plume boundary wells (formerly within the plume, now outside or at the boundary) and include: MAFB-175, MAFB-177, MAFB-215, MAFB-222, MAFB-249, MAFB-330, and MAFB-452.

The MBSA Plume CZA (MWH, 2007a; MWH, 2009a) identified one area (Area 3) where the Unit B ACL volume was both undefined and uncaptured. Since the 2007 CZA report was issued, several new groundwater monitoring wells and one new extraction well were installed in this area, also known as the Southwest Lobe of the MBSA Plume. The installation of three triple-completion monitoring wells (MAFB-429Bu/Bs/Bd, MAFB-431Bd/Ds/Dd, and MAFB-434Bu/Bs/Bd) and groundwater extraction well MBS EW-13BuB were described in the *Annual and Fourth Quarter 2007 Groundwater Monitoring Report* (MWH, 2008). Three additional dual-completion groundwater monitoring wells (MAFB-449Bs/Bd, MAFB-457Bs/Bd, and MAFB-458Bs/Bd) were installed in 2008 in an attempt to delineate the VOC (primarily TCE) plume exceeding cleanup levels. All three sets of wells were constructed with a well casing screened in the shallow Unit B (Bs) gravels and another screened in the deep Unit B sands. No COCs have been detected at concentrations greater than cleanup levels at MAFB-449Bs/Bd, MAFB-457Bd, or MAFB-458Bs. TCE was detected at a concentration (6.4 µg/L) slightly greater than the cleanup level at MAFB-457Bs in 2013, but TCE concentrations at this well have been decreasing since the historical maximum concentration (12 µg/L) was detected in 2010. TCE at MAFB-458Bd has a similar decreasing trend, and the concentration detected in the 2013 sample was less than the ACL. Based on 2013 data, it appears that only a small part of the southwest lobe of the MBSA Plume is not captured by extraction at MBS EW-13BuB, and the plume area is decreasing.

In response to the TCE detections reported at MAFB-457Bs and MAFB-458Bd after their installation in 2008, 16 additional off-base, privately-owned wells (OFB-69 through OFB-84; Figure 2-1 and Figure 7-1) were sampled for VOCs in 2Q09 to supplement the existing monitoring data in this area. OFB-72, the private well closest to the downgradient edge of the Southwest Lobe, is owned by Teichert and operates intermittently, filling a holding tank with water that is used to fill water trucks for dust control in the aggregate mine areas. OFB-72 has been sampled quarterly since 2Q09 and TCE concentrations have decreased from a maximum of just under 4 µg/L in 2010 to an estimated concentration of 0.7 µg/L in 1Q13. However, the TCE concentration at OFB-72 increased during each successive quarter of 2013 to 1.6 µg/L in 4Q13. OFB-80, approximately 840 feet downgradient from OFB-72, is also sampled quarterly and no VOCs have been detected in this well. Additional wells in this area, OFB-79, OFB-81, and OFB-85, have been sampled periodically since 2009; no VOCs have been detected in samples collected from these wells.

As a result of the TCE detections at OFB-72, and concern that plume migration was being significantly influenced by pumping supply wells, two dual-completion groundwater monitoring wells (MAFB-460Bs/Bd and MAFB-461Bs/Bd) were installed downgradient from the Southwest Lobe and upgradient of OFB-72 in 4Q09. Both wells were constructed with screened intervals in shallow and deep Unit B, similar to regionally upgradient monitoring wells MAFB-449Bs/Bd, MAFB-457Bs/Bd, and MAFB-458Bs/Bd. The MAFB-460 and MAFB-461 well clusters, along with other Southwest Lobe monitoring wells are shown in cross-sectional view on Figure 6-13. Quarterly samples collected in 2013 contained TCE concentrations ranging from 1.3 to 1.9 µg/L for MAFB-460Bs, similar to, but slightly lower than concentrations reported in 2012. TCE concentrations were between 0.6 µg/L and 1.5 µg/L at MAFB-460Bd in 2013, continuing an upward trend since 2011. MAFB-461Bs and MAFB-461Bd are located slightly southwest of the MAFB-460 well cluster and closer to several off-base pumping wells (OFB-79, OFB-80, and OFB-85). No VOCs were detected in the initial sample collected from MAFB-461Bs or MAFB-461Bd. However, TCE has been detected at trace to low concentrations (all less than 0.5 µg/L) in all subsequent samples. Quarterly samples collected from MAFB-461Bd in 2013 contained no detectable TCE. These wells help to define the ACL volume, the boundary of which lies between MAFB-457/MAFB-458 and MAFB-460. These wells also provide vertical definition for TCE, as any concentrations detected in the deeper wells were below quantitation limits. To help delineate the vertical extent of the TCE plume downgradient from MBS EW-13BuB, a D zone monitoring well (MAFB-462) was installed adjacent to the MAFB-460 location in 2011. MAFB-462 has been sampled quarterly since its installation, and TCE has never been detected.

The estimated capture area associated with MBS EW-13BuB is slightly smaller relative to that of 2012, and a small portion of the Southwest Lobe TCE plume may be beyond the estimated 2013 capture zone (Figure 6-6). The water table in this area is relatively flat, and the precise location of the toe of the plume and the limit of capture is difficult to interpret. However, TCE concentrations are decreasing within and near the downgradient edge of the plume. The capture extent will continue to be assessed in 2014 with continued monitoring of water levels and TCE concentrations in this area.

COC concentrations in several Unit B groundwater extraction wells were less than ACLs and lower in 2013 than in previous samples. These wells include MBS EW-1B, MBS EW-4B, MBS EW-5B, MBS EW-6B, and MBS EW-7B. MBS EW-12B has not contained COCs exceeding ACLs since 2008, but had slightly higher concentrations in 2013 than in the previous sample collected in 2011. MBS EW-8B was turned off in February 2010, and PCE, the only COC of note, remained relatively stable after it dropped below the ACL in 2004.

The active Unit B extraction wells mentioned above were evaluated for potential shutdown using the extraction well shutdown decision logic (Figure 2-3). MBS EW-1B, MBS EW-4B, MBS EW-5B, and MBS EW-6B meet the decision criteria for shutdown. With the exception of a PCE concentration of 5.1 µg/L (ACL = 5.0 µg/L) detected at MBS EW-1B in 2Q11, samples from these wells have been below ACLs for all wells since at least 2010 (Appendix C). Additionally, COC concentrations in nearby monitoring wells are below ACLs, with the following three exceptions. MAFB-227 lies between MBS EW-3B and MBS EW-4B; it is believed that most or all contamination in this area would be captured by MBS EW-3B after MBS EW-4B is shut down. MAFB-220 lies south of MBS EW-4B, and within the capture zone of MBS EW-7B. MAFB-175 lies cross gradient from MBS EW-5B, but it is directly between MBS-EW-7B and MBS EW-10B, so contamination in the area of MAFB-175 will be captured by MBS-EW-7B and MBS EW-10B. Therefore, shutting down extraction wells MBS EW-1B, MBS EW-4B, MBS EW-5B, and MBS EW-6B would not allow contamination exceeding ACLs to escape capture. Water-level and water-quality monitoring of these wells will continue for at least four semi-annual periods to confirm that MBS EW-3B and MBS EW-7B will capture contaminated groundwater represented by results at MAFB-227 and MAFB-220, respectively. MBS EW-7B meets most of the logic requirements for shutdown, but appears to be necessary to ensure capture of CCl_4 at the hot spot near Site 57 (Figure 2-3) and PCE near MAFB-220 and possibly PCE near MAFB-227 should any escape MBS EW-3. MBS EW-12B should remain operating to assist in the capture of the off base CCl_4 plume located near the Juvenile Hall and Moonbeam supply wells (Figure 6-8).

Unit D. Figures 6-9 through 6-11 illustrate the Unit D ACL plumes for TCE, PCE, and CCl_4, respectively, for 4Q13, as well as estimated capture zones based on 4Q13 Unit D elevation contours. No other COCs were detected above cleanup levels during 2013 in Unit D. The ACL volume in Unit D decreased in 2013 as a result of continued groundwater extraction and removal of VOCs (Table 6-2) by the MBSA extraction system.

One area of uncertainty identified in the MBSA Plume CZA (MWH, 2007a; MWH, 2009a) was the deeper portion of Unit D beneath groundwater monitoring well MAFB-102 and extraction wells MBS EW-1D, MBS EW-2D, and MBS EW-3D; this area was designated in the report as Area 1. Two wells were installed in 2007 to monitor this area. The first well, MAFB-430, was installed in the LMT between, and deeper than, MBS EW-1D and MBS EW-3D. CCl_4 was detected at 0.77 µg/L in the 2Q09 sample and has decreased slightly in concentration in each subsequent annual sample to an estimated 0.5 µg/L in 2013. PCE has also been detected at MAFB-430; however, PCE was only detected greater than the ACL once in 2008. The second well, MAFB-435, was installed near the intersection of Routier Road and Old Placerville Road to provide vertical constraint to the PCE and CCl_4 concentrations observed at co-located shallower Unit D well MAFB-180. PCE and CCl_4 have been detected at concentrations greater than the ACLs in every sample collected from MAFB-435 since the well was installed in 2008, although at lower concentrations than at MAFB-180.

In October and November 2011, two new groundwater monitoring wells (MAFB-463D and MAFB-463Dd) were installed to provide additional water quality information on plume extent in Area 1. MAFB-463D was installed at a depth similar to MAFB-181, between MAFB-181 and MBS EW-6D (Figure 6-14). MAFB-463Dd was installed in the same borehole but at a depth similar to MAFB-435 (Figure 6-14). The PCE concentration at MAFB-463D increased to greater than the ACL in 2012, resulting in the extension of the interpreted downgradient extent of the PCE plume (Figures 6-10 and 6-14). The plume was extended farther downgradient in 2013 because of the increase in PCE concentration at MAFB-332. The vertical extent is defined by 463Dd because PCE has not exceeded the 0.2 µg/L since the well was installed in 2011. The migration of the PCE plume in the downgradient direction may be the result of the operation of MBS EW-6D, as well as the operation of the Moonbeam Drive (OFB-04) and Juvenile Hall production wells (OFB-51 and OFB-52).

The PCE concentration detected in the 2013 sample collected at MAFB-366D (0.3F µg/L) is less than the ACL. The previous sample collected at this well in 2011 had a PCE concentration (24 µg/L) more than four times the ACL. Additionally, the PCE concentration detected at MAFB-296, which is now the only well defining the northwestern portion of the plume, was less than the concentration detected in the previous sample (2011) but is still slightly greater than the ACL (5.8 µg/L). These reductions in PCE concentrations northeast of Area 1 have resulted in a reduction in the size of the interpreted plume near MBS EW-5D.

From late 2008 to 2009, the Air Force measured water levels more frequently from several wells in Area 1 to better understand seasonal patterns in the vertical gradient. It was determined that the direction of the vertical gradient varies through time and likely is controlled by seasonal patterns of regional pumping. Gradients were downward during the period of lowest water levels, corresponding roughly to June through October 2009 when regional pumping was greatest. The gradient neutralized in late fall, and by the end of the year the gradient direction was upward. The implication of this focused water level study is that the potential for downward contaminant migration (Unit D to Bd) does exist during part of the year but that upward gradients during the rest of the year mitigate the net vertical transport of contaminants. Additionally, the downward migration and mixing with uncontaminated water in deeper zones in Area 1 would dilute contaminant concentrations to less than cleanup levels.

Another location identified as an area of uncertainty in the 2007 CZA (MWH, 2007a) was the area around Unit D groundwater monitoring wells MAFB-102 and FFS MW15-6 (CZA Area 2). Two new monitoring wells, MAFB-441 and MAFB-442, were installed in 2008, to characterize the horizontal and vertical extents, respectively, of TCE and CCl_4 detections at MAFB-102 and FFS MW15-6. No notable COC detections have been reported in samples collected at MAFB-441 or MAFB-442 since the wells were installed in 2008. It should be noted that since 2008 VOC detections at MAFB-102 and FFS MW15-6 have been within historical ranges with the exception of an all-time high CCl_4 concentration of 2.5 µg/L at FFS MW15-6 in 2Q09. In 2013, the TCE concentration at FFS MW15-6 was less than the ACL (Figure 6-9).

The area around MAFB-318 was identified in the 2007 CZA (MWH, 2007a) as CZA Area 4, a location where capture was uncertain. The subsequent CZA update (MWH, 2009a) concluded that capture of the plume in this area, by the Moonbeam well, is likely. In 2013 the sample collected from MAFB-318 contained CCl_4 at a concentration of 4.4 µg/L (Figure 6-11), less than the 6.6 µg/L detected in 2012, which was the new maximum concentration at this well. Unit D groundwater monitoring wells including MAFB-336, MAFB-382D, MAFB-388Ds, and MAFB-443 (installed as a result of the 2007 CZA) are located regionally downgradient from MAFB-318, and CCl_4 has never been detected at a concentration greater than the cleanup level at any of these wells, supporting the 2007 CZA conclusion that the plume is likely captured.

In 2013, the areal extent of the off-base plume is smaller, and the maximum concentrations detected were less than they were in 2012. Figure 6-14 depicts a cross-section in this area of the plume; this cross-section has been updated to extend to the off-base water supply wells for this report. The extension of this plume, caused by the PCE concentration at MAFB-332 exceeding the ACL for the first time since 2007, may be due to extraction at MBS EW-6D, as well as production at water supply wells OFB-04 (Moonbeam), OFB-51 (Juvenile Hall No. 1), and OFB-52 (Juvenile Hall No. 2). However, the 2011 through 2013 CCl_4 concentrations detected at MAFB-318 were the highest CCl_4 concentrations detected beyond the boundaries of Mather in those years. CCl_4 concentrations at MAFB-318 have shown a gradually increasing trend since approximately 2002 with a more notable increase after approximately 2009 (a similar pattern in PCE concentrations occurred during the same period). Concentrations of CCl_4 as high as those detected at MAFB-318 are not reported in any other Unit D well and are more within the range of CCl_4 concentrations detected in wells beneath known Mather source areas. The CCl_4 plume is within the interpreted combined capture zone for MBS EW-6D, OFB-04, and the two Juvenile Hall wells.

MBS EW-6D is located between OFB-04 and most of the CCl_4 ACL plume. Water produced from OFB-04, OFB-51, and OFB-52 is treated with granular-activated carbon (GAC). To assess this area further in 2014, the wells in this area will be monitored as presented in the *2014 Mather Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

6.3 CONCLUSIONS AND RECOMMENDATIONS

Plume areas and concentrations at the water table generally decreased in 2013 relative to 2011-2012 for all COCs with concentrations exceeding their ACLs with a couple of minor exceptions. The TCE plume at the water table expanded slightly in area, although most in-plume concentrations generally decreased, including a reduction in the size of the hot spot area, which is currently defined by only one well. The CCl_4 hot spot area below Site 57 decreased in area, but a new hot spot is defined by MAFB-264. Samples collected in 2013 did not contain any 1,1-DCE concentrations exceeding the ACL.

Plume areas and concentrations in Unit B generally decreased in 2013 relative to 2011-2012 for all COCs, including a reduction in the size and downgradient extent of the Southwest Lobe TCE plume and a nearly 50 percent reduction in the PCE plume area.

Plume areas and concentrations in Unit D generally decreased in 2013 relative to 2011-2012 for TCE and CCl_4, most notably for CCl_4, most of which is located beyond the Mather boundary. The off-base PCE plume grew in area with a downgradient extension of the plume primarily attributed to the concentration in MAFB-332 exceeding the ACL in 2013. Progress is being made toward achieving the objectives of the remedial action at the MBSA Plume.

With the exception of the less than 1 percent of the Southwest Lobe TCE plume in Unit B that appears to be beyond capture, the MBSA Plume groundwater extraction and treatment system, as well as treatment at the Moonbeam and Juvenile Hall production wells, is successfully implementing the remedy and achieving the objectives of the remedial action. It is recommended that extraction well flow rates be evaluated and optimized in 2014 to improve capture and optimize remediation of the MBSA Plume. Additionally, several Unit B extraction wells are operating in areas where COCs do not exceed ACLs and shut down of the wells will not allow COCs exceeding ACLs to escape capture. It is recommended that MBS EW-1B, MBS EW-4B, MBS EW-5B, and MBS EW-6B be shut down prior to the 2Q14 gauging and sampling event to provide 2Q14 data to confirm that COCs exceeding ACLs are captured by the remaining active extraction wells. Additionally, it is recommended that these wells be sampled semiannually in 2014 and 2015 to assess potential concentration rebound at each location.

With the exception of the increased sampling frequency (semiannual) recommended for MBS EW-1B, MBS EW-4B, MBS EW-5B, and MBS EW-6B, groundwater monitoring for 2014 will be conducted in accordance with the *2014 Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

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7.0 OFF-BASE WATER SUPPLY WELL MONITORING PROGRAM

Of the 10 large drinking water wells included in the Off-base Monitoring Program, 8 are owned by the Cal Am and 2 are owned by the County of Sacramento (Figure 7-1). Cal Am wells OFB-27, OFB-32, OFB-54, OFB-55, and OFB-56 (and their associated monitoring wells) were sampled quarterly in 2013 (URS, 2013a). OFB-31 and OFB-49 were sampled during the quarterly sampling events while they were operating (Table 7-1).

Cal Am well OFB-04 (also called Moonbeam) was sampled monthly in 2013. The two county-owned wells (OFB-51 and OFB-52, also known as the Juvenile Hall wells) were sampled quarterly, and the treatment system associated with these two wells was sampled monthly. All samples were analyzed for VOCs using EPA Method 524.2.

The 2013 analytical results (shown in Table 7-1 for quarterly samples and Table A-1 for all samples) for Mather COCs are summarized below. Detailed descriptions of supply well monitoring, including monthly maintenance activities at the GAC systems, are provided in monthly Off-base Wellhead Treatment System and Supply Well Sampling reports.

An update to the Contingency Plan was finalized and submitted to the regulatory agencies in July 2013 (AFCEC, 2013). In addition to updated references, the revision added an appendix addressing the private wells sampled by the Air Force (see Section 7.2).

7.1 SUPPLY WELL MONITORING AND TREATMENT SYSTEM MAINTENANCE

Maintenance activities and 2013 sampling results for Mather COCs for the 10 large drinking water wells and the Juvenile Hall Treatment System are summarized below.

- **OFB-04 – Moonbeam Treatment System Sampling:** The current Moonbeam Drive Well GAC treatment began 27 November 2012. No GAC treatment was necessary from mid-2010 until mid-2012. The treatment system is equipped with a dual-canister GAC system that treated water at an average flow rate of approximately 560 gpm during 2013. Monthly samples were collected from the treatment system influent and mid-GAC and analyzed using EPA Method 524.2 for drinking water. In 2013, CCl_4 was detected in monthly treatment system influent samples at concentrations ranging from less than the detection limit to an estimated concentration of 0.19 µg/L. CCl_4 concentrations at the end of 2013 had been less than one-half of the MCL (i.e., less than 0.25 µg/L) for 15 consecutive months (beginning October 2012), including six sample results less than the detection limit. According to the Contingency Plan, these results indicate that wellhead GAC treatment may be discontinued upon giving Cal Am 6 months of notice. However, GAC treatment cessation is not proposed at this time.
- **OFB-27 – Mars:** No COCs were detected during 2013.
- **OFB-31 – Gould:** The well was not sampled in the first three quarters of 2013 because the well was offline. The 4Q13 sample contained TCE at an estimated concentration of 0.12 µg/L and PCE at a concentration of 0.42 µg/L. The TCE concentration is consistent with historical detections, and the PCE result is the maximum concentration reported from this well in samples collected by the Air Force on a quarterly basis (when operating) since 1998.
- **OFB-32 – Nut Plains:** No COCs were detected during 2013.
- **OFB-49 – Oaken Bucket:** No COCs were detected during 2013. The well was not sampled in 1Q13 or 4Q13 because the well was off line.

- **OFB-54 – South Port:** 1,1-DCE was detected in three of four quarterly samples at estimated concentrations ranging from 0.25 to 0.31 µg/L. The 1,1-DCE detections, which were consistent with historical detections, are not considered to be associated with the Mather groundwater plume because this well is located far from any known Mather VOC contamination and this analyte is rarely detected in off-base wells. No other COCs were detected in 2013.
- **OFB-55 – Westporter:** No COCs were detected during 2013.
- **OFB-56 – Tallyho #2:** No COCs were detected during 2013.

Drinking water wells OFB-51 (Juvenile Hall No. 1) and OFB-52 (Juvenile Hall No. 2) are owned by the County of Sacramento and supply water to the County's Branch Center Complex. One dual-canister GAC treatment system serves both wells. The 2013 analytical results from these wells are summarized below:

- **OFB-51 – Juvenile Hall No. 1:** The only COC detected in the OFB-51 wellhead samples during 2013 was CCl_4, which was detected in each of the quarterly samples at concentrations ranging from less than the detection limit (0.5 µg/L) to 0.6 µg/L (within the range of historic concentrations).
- **OFB-52 – Juvenile Hall No. 2:** The primary COC detected in the OFB-52 wellhead samples during 2013 was also CCl_4, which was detected in all four quarterly samples at concentrations ranging from of 0.23 to 0.34 µg/L. A trace detection of PCE was also reported in the 1Q13 sample.
- **OFB-51/52 – Treatment System Sampling:** The treatment system is equipped with a dual-canister GAC unit that treated water at an average flow rate of 5.2 gpm during 2013. Monthly samples were collected from the treatment system influent and mid-GAC and analyzed using EPA Method 524.2 for drinking water. CCl_4 was detected in monthly treatment system influent samples at concentrations ranging from 0.31 to 0.66 µg/L. Trace concentrations of TCE and PCE were also reported in the October influent sample. Trace concentrations of cis-1,2-DCE were detected in approximately one-half of the mid-GAC samples analyzed in 2013.

Analytical results, including those from all 10 supply wells in the program, are reported in monthly letter reports to the AFCEC, regulatory agencies, Sacramento County Department of Water Resources, and Cal Am. The monthly reports include results from monthly or quarterly samples collected at the wellhead, between GAC canisters, and from treated effluent, as needed.

7.2 ANNUAL MONITORING OF PRIVATE WATER SUPPLY WELLS

Samples were collected from 31 of 35 scheduled private water supply wells during 2013 (Table 7-1). Note that none of the wells listed in the Happy Lane and Old Placerville Road vicinity are used for potable water supply; in the 1980s, the Air Force paid Cal Am to install a water main to serve those well owners. OFB-08, OFB-09, OFB-46, and OFB-70 were not operable during the sampling event in 2013. Analytical data from the wells sampled are presented in Table A-1, and COC detections are summarized below:

- **OFB-03 –** This well owned by Granite and used mainly for aggregate washing (and possibly for dust control). No VOCs were detected in 2013, the first year that this well was sampled as part of this program.
- **OFB-06 – 4294 Happy Lane:** VOCs were not detected in 2013. The results are consistent with historical results. The well pump was removed after the 2003 sampling event and the well is no

longer used. Sampling has been accomplished with a bailer since 2004. The well extends to just below the water table.

- **OFB-07 – 4274 Happy Lane:** TCE and PCE were detected at a concentration of 1.2 µg/L and an estimated concentration of 0.2 µg/L, respectively, during 2Q13. These concentrations are similar to those detected in 2012. This well is used for irrigation and fish ponds; it is not used as a potable water supply.
- **OFB-08 –** The well was not sampled in 2013 because the well was not operating.
- **OFB-09 – 4095 Happy Lane:** The well has not been sampled since 2009 because the wellhead has been damaged and the well is not operable. TCE and PCE were detected at 0.55 and 0.17F µg/L, respectively, in 2009. Those results were consistent with other recent historical results since 2005. The maximum TCE concentration at this well was 71 µg/L in 1996, but TCE concentrations at OFB-09 have been less than the MCL since 2001. The decline in TCE at this well likely was a result of water infiltration after expansion of the Granite siltation ponds nearby.
- **OFB-12 – 4016 Happy Lane:** TCE and PCE were detected at a concentration of 1.3 µg/L and an estimated concentration of 0.2 µg/L, respectively. The results are consistent with historical data. This well is used solely for irrigation purposes; it is not used as a potable water supply.
- **OFB-17 – 3900 Happy Lane:** VOCs were not detected during 2013. Historically, trace detections of TCE have been reported in samples collected from this well.
- **OFB-24 – 9970 Old Placerville Road:** PCE was not detected in the sample collected in 2Q13. Historically, detections of PCE have been sporadic in this well. PCE has ranged from less than the detection limit to 24 µg/L. No other COCs were detected in 2013. This well is used solely for irrigation purposes; it is not used as a potable water supply.
- **OFB-39 – 9760 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-40 – 9880 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-43 – 9932 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-46 – 10180 Jackson Highway:** The well was not sampled during 2013 because the electrical service to the pump was destroyed by a fire after the 2009 sample was collected and the well had not been restored to service as of the 2013 sampling event.
- **OFB-47 – 10221 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-48 – 10175 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-53 – 10204 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-57 – 9815 Jackson Highway:** VOCs were not detected during 2013, consistent with historical results.
- **OFB-67 – 9721 Farm Lane:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-69:** VOCs were not detected during 2013, consistent with previous results.

- **OFB-70**: The well was not sampled in 2013 because there is no electrical connection to the pump. No COCs were detected in the last sample collected in 2011.
- **OFB-71:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-72:** PCE and TCE concentrations reported in quarterly samples ranged from less than the detection limit to 0.2 and 0.7 to 1.6 µg/L, respectively. No other VOCs were detected in 2013. Water from this well is used for dust control on mining roads and possibly for dust control on conveyor belts; it is not used for potable water supply.
- **OFB-73:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-74:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-75:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-76:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-77:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-78:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-79:** VOCs were not detected during quarterly sampling in 2013, consistent with previous results.
- **OFB-80:** VOCs were not detected during quarterly sampling in 2013, consistent with previous results.
- **OFB-81:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-82:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-83:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-84:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-85:** VOCs were not detected during 2013, consistent with previous results.
- **OFB-86:** VOCs were not detected during 2013, consistent with previous results.

7.3 OFF-BASE PLUME DISTRIBUTIONS

The MBSA Plume extends westward beyond the Mather boundary (Section 6.0) and is found off Mather at concentrations above ACLs in HSG Units B and D. Figures 6-6 through 6-11 show the distribution of contaminants and the configuration of the off-base portion of the MBSA Plume during 2013 in HSG Units B and D. Pumping at off-base production wells OFB-72 and OFB-85 may influence the migration of the Southwest Lobe portion of the TCE plume and pumping at water supply wells OFB-04, OFB-51, and OFB-52 are influencing the CCl_4 plume west of the former base boundary. Refer to Section 6.0 for a description of the MBSA Plume.

The Site 7 Plume also extends off base southwestward from the Site 7 Landfill (Section 5.0), and is found in the water table and HSG Units B and C. Figure 5-1 shows the distribution of contaminants and configuration of the Site 7 Plume. Refer to Section 5.0 for a description of the Site 7 Plume.

7.4 CONCLUSIONS AND RECOMMENDATIONS

Based on analysis of the groundwater analytical data collected during 2013, there were no changes in the potential threat to any public or private water supply wells that would indicate the need to revise sampling frequencies. Samples collected from private wells downgradient of the Site 7 Plume did not contain detectable concentrations of VOCs. The GAC treatment at the Juvenile Hall and Moonbeam groundwater treatment systems is effective and no carbon change-outs were necessary in 2013.

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8.0 ANALYTICAL DATA QUALITY SUMMARY

This section summarizes the Quality Assurance/QC results for groundwater well samples collected and data generated in support of AC&W, MBS, Landfill, Site 7, and Off-base groundwater monitoring, as well as the AC&W, MBS, Site 7, and Off-base treatment system performance monitoring for 2013. Data quality was evaluated by examining both the field and analytical programs. Sampling and analytical protocols for groundwater and performance monitoring during 2013 are documented in the *2013 Groundwater Monitoring Program Sampling Plan* (URS, 2013a).

Data were reviewed and qualified using the criteria in Part II – Quality Assurance Project Plan (QAPP) of the Sampling and Analysis Plan (SAP) (MWH, 2010e). Precision and accuracy were evaluated from field and laboratory QC samples as well as analytical calibrations. The calculated relative percent difference from matrix spike/matrix spike duplicates (MS/MSD) and field and laboratory duplicate pairs provided information on the precision of chemical analyses and field sampling procedures. Evaluation of the percent recoveries of spiked analytes in laboratory control samples, MS/MSDs and surrogates provided information on accuracy. Additionally, the initial and continuing calibration results and interference check solutions provided information on analytical accuracy. External contamination was assessed through the evaluation of method blanks, trip blanks (TBs), and continuing calibration blanks (metals analyses). Comparability of the data was ensured by having project personnel follow standardized field procedures described in the Field Sampling Plan (MWH, 2010e) and having laboratories follow EPA analytical methods. The completeness of the data is the measure of the amount of valid data for each method and matrix (expressed as a percentage). Completeness and integrity of data were evaluated by validating all the project data, ensuring that all the analytical requests were met, noting whether samples were received in proper condition, and verification that analyses were performed within the appropriate holding times.

Data results flagged as estimated (J) or (M) or having an estimated reporting limit (RL) (UJ) are acceptable and usable but should be used with an understanding of the limitations (potential bias) during data interpretation. Data results flagged with “F” were detected between the detection limit (DL) and the RL are also considered estimated concentrations. Furthermore, data flagged “B” or “BF” should be considered not detected; the result is an artifact of external contamination and does not represent site conditions.

Note: The QAPP defines blank contamination only when a blank result exceeds half of the RL; however, because all data are reported to the method detection limit, URS assessed the reported blank value as reported (even if the result was below half of the RL).

8.1 2013 DATA

URS staff collected groundwater samples from 28 field efforts in 2013: quarterly sampling events (1Q13 through 4Q13), monthly off-base wellhead and treatment system sampling events (January 2013 through December 2013), and monthly on-base treatment system sampling events (January 2013 through December 2013). These results were validated in accordance with procedures described in the SAP Part II QAPP (MWH, 2010e). Groundwater samples collected for Method E524.2 analysis (VOCs) were analyzed by Agricultural & Priority Pollutant Laboratory, Inc. in Clovis, California; and all other groundwater samples were analyzed by Curtis & Tompkins in Berkeley, California. The data were evaluated at a minimum on the following parameters:

- Sample integrity#
- Initial calibration*
- Second source standard#

- Continuing calibration#
- Blank analysis#
- Laboratory control samples#
- MS recoveries and relative percent differences#
- Surrogate spikes recoveries#
- RLs*
- Data completeness*

* = All criteria were met for this parameter.
\# = See below for parameter not meeting criteria.

The following samples were collected:

General Chemistry

Alkalinity by Method A2320 (36 normal samples [NS], 2 field duplicates [FD], and 4 MS/MSDs)

TDS by Method A2540C (35 NS, 1 FD, 1 MS/MSD)

Total hardness by E130.2 (32 NS and 1 FD)

Total suspended solids (TSS) by Method E160.2 (14 NS and 1 MS/MSD)

Method E300.0 (chloride - 36 NS, 1 FD, and 6 MS/MSD), (fluoride - 11 NS), (nitrite - 25 NS, 1 FD, and 4 MS/MSD), (sulfate - 36 NS, 1 FD, and 4 MS/MSD)

Sulfide by Method E376.2 (12 NS and 4 MS/MSD)

Total Petroleum Hydrocarbons

Diesel oil by modified Method M8015D (24 NS, 3 FD, and 2 MS/MSD)

Gasoline by modified Method M8015V (30 NS, 4 FD, 7 MS/MSD, and 10 TB)

Metals

Hexavalent chromium by Method SW7196A (13 NS, 2 FD, and 2 MS/MSD)

Mercury by Method SW7470A (26 NS, 2 FD, and 3 MS/MSD)

Filtered metals by Method SW6010B – (7 metal suite, 16 NS, 1 FD, 3 MS/MSD), (15 metal suite, 26 NS, 3 FD, and 8 MS/MSD), (nickel only, 1 NS)

Filtered metals by Method SW6020 (15 metal suite, 1 NS, 1 MS/MSD), (7 metal suite, 4 NS), (lead only, 9 NS, 1 MS/MSD), (selenium only, 1 NS, 1 MS/MSD), (thallium only, 25 NS, 3 FD, and 6 MS/MSD), and nickel only, 3 NS, 1FD)

Dissolved metals by Method SW6020 - (lead only, 13 NS and 1 MS/MSD) and (selenium only, 13 NS, 1 MS/MSD)

Volatile Organic Compounds

Volatiles by Method E524.2 (115 NS, 10 FD, 4 MS/MSD and 14 TB)

Volatiles by Method SW8260B (419 NS, 50 FD, 22 MS/MSD, and 30 TB)

Pesticides and Polychlorinated Biphenyls (PCBs)

Organochlorine pesticides by SW8081A (4 NS and 1 FD)

PCBs by SW8082 (4 NS and 1 FD)

Semivolatile Organic Compounds (SVOCs)

Polynuclear aromatic hydrocarbons (4 NS and 1 FD) by Method SW8270C

Based on the validation performed, all data for 2013 are acceptable and can be used for data interpretation. Data flagged as estimated concentrations (J or M), estimated RLs (UJ), detected between DLs and RLs (F), and not detected (B) are acceptable and useable but should be used with an understanding of limitations (potential bias) during data interpretation. Data flagged "B" or "BF" should be considered "not detected." The result most likely is attributed to external contamination. Table 8-1 provides completeness by Method for 2013 data. Table 8-2 presents qualified NS results for 2013.

General Chemistry

Method A2320: No results for alkalinity are qualified.

Method A2540C: A total of 18 TDS results are qualified as estimated concentrations because of poor laboratory duplicate precision and four additional results are qualified because of poor laboratory control sample/laboratory control sample duplicate (LCS/LCSD) precision or field duplicate precision.

Method E130.2: No results for total hardness are qualified.

Method E160.2: A total of four results for TSS are qualified because of poor LCS/LCSD precision.

Method E300.0: Nine fluoride results are qualified as estimated concentrations because they were detected between the DL and RL.

Method E376.2: A total of eight sulfide results are qualified. Seven results are qualified as estimated detections because they were detected between the DL and RL. One result is qualified as potential low bias due to matrix interference.

Total Petroleum Hydrocarbons

Modified Method M8015D: A total of 23 TPH-d results are qualified. Fifteen diesel results are qualified as not detected because of blank contamination. Ten of these15 results are also detected between the DL and RL, and four of these fifteen results had sample patterns that did not match the standard pattern. Seven results are qualified as estimated concentrations because they are detected between the DL and RL;

one of these seven results is also qualified due to field duplicate imprecision. One diesel result is qualified because the sample pattern does not match the standard pattern.

Modified Method M8015V: A total of 20 TPH-g results are qualified. Twelve results are qualified as not detected due to external contamination; these results are also detected between the DL and RL. Eight additional results are qualified as estimated concentrations because they are detected between the DL and RL.

Metals

Method SW6010B: A total of 136 metals results are qualified. Ninety-three results are qualified as estimated concentrations because they are detected between the DL and RL; one of these results is also qualified because of poor field duplicate precision and another is qualified due to an analytical spike not meeting criteria. Twenty-one results are qualified as not detected due to external contamination; these results are also detected between the DL and RL. In addition, 1 of these 21 results is qualified due to field duplicate imprecision. Two results are qualified as estimated concentrations because the serial dilution did not meet the project criteria. Eighteen results are qualified as estimated RLs due to low analytical spike recoveries and two results are qualified due to poor field duplicate precision.

Method SW6020: A total of 31 results are qualified. Six results are qualified as not detected due to external contamination; these results are also detected between the DL and RL. Twenty-four results are qualified as estimated concentrations because they are detected between the DL and RL; one of these 24 results is also qualified due to matrix interference. One result is qualified as an estimated concentration due to a serial dilution not meeting criteria.

Method SW7196A: No results for hexavalent chromium are qualified.

Method SW7470A: A total of seven results are qualified for mercury. Three results are qualified as not detected due to external contamination; these results are also detected between the DL and RL. Four results are qualified as estimated concentrations because they are detected between the DL and RL.

Volatile Organic Compounds

Method E524.2: A total of 217 results were qualified. Eighty-four results are qualified as estimated concentrations because they are detected between the DL and RL. One of these 84 results is also qualified due to poor field duplicate precision and another is qualified because sample preservation requirements were not met. Two additional results, also detected between the DL and RL, are qualified as not detected due to external contamination. Sixteen results are qualified for potential low bias due to matrix interference indicated by low MS recoveries. Results for two samples (115 not-detected results) are qualified as estimated RLs because sample preservation requirements were not met.

Method SW8260B: A total of 435 results are qualified. Three hundred and forty-three results are considered estimated concentrations because they are detected between the DL and RL. Twelve of these 343 results are also qualified as not detected due to external contamination. In addition, 74 of these 343 results are qualified for other quality issue including field duplicate imprecision, high continuing calibration verification (CCV), LCS, or surrogate spike recoveries. Forty-eight results are qualified as estimated due to high surrogate spike recoveries and one result for poor field duplicate precision. Ten results are qualified due to matrix interference, along with other quality issues including field duplicate imprecision and bubbles in the sample container. Seventeen results (non-detects from 2 samples) are qualified as estimated RLs due to bubbles in the sample containers. Three results are qualified as estimated RLs due to a low second source standard and one result is qualified as an estimated RL due to a low CCV.

Pesticides and PCBs

Method SW8081A: A total of six results are qualified. Four results are qualified as estimated RLs due to low CCV recoveries and another two results are qualified as estimated RLs due to a low second source standard.

Method SW8082: No PCB results are qualified.

SVOCs

Method SW8270C: No SVOC results are qualified.

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9.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This section highlights observations noted in monitoring programs at Mather during 2013. These programs include landfill post-closure performance monitoring and NEP monitoring; performance monitoring of groundwater extraction and treatment systems for the AC&W, Site 7, and MBSA plumes; and off-base water supply well monitoring.

9.1 NORTHEAST PLUME AND LANDFILLS

A summary of activities and observations based on monitoring performed in 2013 are as follows:

- 4Q13 began the 18th year of post-closure sample collection and analysis at LF03 and LF04 and represented the 12th year of quarterly post-closure sampling for the landfill at Site 7. Landfill post-closure monitoring wells were sampled quarterly, semiannually, or annually for the required list of analytes.
- Groundwater levels in all accessible NEP and landfill monitoring wells were measured semiannually (2Q13 and 4Q13).
- The lateral and vertical extents of the downgradient boundary of the ACL volume of the NEP are adequately defined by the current monitoring network, with the exception of deep contamination at MAFB-398C.
- For the NEP, COC concentrations at or greater than cleanup levels in 2013 were restricted to the area near MAFB-132, MAFB-398C, and MAFB-465. The 2013 sample results at Unit C monitoring well MAFB-398C indicate that deeper contaminant concentrations continue to exceed ACLs.
- For chromium and nickel evaluation monitoring at LF03 and LF04 during 2012, a new well with a PVC screen (MAFB-465) was installed between MAFB-132 and LF04. Samples from this well were used to determine that elevated chromium and nickel concentrations, relative to background concentrations, detected in water table wells are associated with stainless steel screens and not a potential release from the landfill.
- For WP07 during 2013, no non-VOC detections exceeded calculated background values.

Based on the results of NEP performance monitoring data, the following activities are recommended for monitoring:

- Discontinue sampling the evaluation monitoring wells for chromium and nickel and revert to detection monitoring at these wells, as stated in the 2014 groundwater sampling plan (URS, 2013c)
- Continue monitoring PCE and cis-1,2-DCE concentrations to maintain an understanding of plume extent and to assess near-source evidence of potentially continuing VOC contributions to the NEP from LF03 and LF04
- Continue monitoring MAFB-398C, and if the increasing contaminant concentration trend continues through the next two annual sampling events (2Q14 and 2Q15), consider installing additional monitoring wells in this area
- Collect samples during 2014 at planned frequencies using analytical methods outlined in the *2014 Mather Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

9.2 AC&W PLUME

A summary of activities and observations based on monitoring performed in 2013 are as follows:

- Monitoring and gauging continued in 2013 and provided data for (1) evaluation of groundwater elevations, (2) verification of plume capture, and (3) progress of TCE remediation.
- On 29 December 2012, the plant stopped operation due to vandalism of the plant's electrical system. The plant was repaired and restarted on 15 March 2013, prior to the start of semiannual water gauging and annual/biennial sampling in 2Q13.
- When operational, the AC&W extraction and treatment system operated at an average flow rate of 87 gpm during 2013 and the system removed approximately 2.7 pounds of TCE.
- No VOCs were detected in the monthly air stripper effluent samples. The quarterly receiving water samples collected at Mather Lake (ACW R-2) contained no detected VOCs during 2013 with one exception. Chloroform was detected in the July 2013 sample collected from ACW R-2; however, chloroform was not detected in the corresponding treatment plant effluent sample, and therefore, did not originate from Mather. Inspections of Mather Lake have indicated no detrimental effect on the receiving waters since discharge to the lake began in 1997. All air emissions and surface water discharge complied with ARARs for the site.
- The highest TCE concentrations detected in the AC&W Plume during 2013 were observed at monitoring well MAFB-453 and extraction wells ACW AT-1 and AT-2, respectively. Remediation of the plume is progressing, and TCE concentrations are generally declining in the downgradient monitoring and extraction wells but are increasing in wells in the upgradient part of the plume.

Based on the results of AC&W performance monitoring data, the following activities are recommended for monitoring and system operations:

- Flow rates and capture at all AC&W extraction wells should continue to be evaluated and possibly modified to more efficiently capture the downgradient part of the plume and remediate the upgradient part of the plume.
- Collect samples during 2014 at planned frequencies using analytical methods outlined in the *2014 Mather Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

9.3 SITE 7 PLUME

A summary of activities and observations based on monitoring performed in 2013 are as follows:

- The Site 7 groundwater extraction and treatment system had two operating extraction wells that removed approximately 2.8 pounds of VOCs from groundwater with a combined average flow rate of 42 gpm during 2013.
- In the perched zone, which occurs at roughly 50 feet bgs (approximately 25 feet above msl), the only COC concentrations that exceeded cleanup levels for the underlying aquifer were in samples collected from wells 7-BV-02 and 7-BV-08.
- Granite constructed and seasonally filled a 40-acre emergent marsh on the west side of the Site 7 Groundwater Plume footprint starting in about 2005. Water depths in the marsh have been as great as 3 feet. The marsh was expected to result in increased recharge to the underlying aquifer but does not appear to have changed local groundwater hydraulic gradient to any measurable

extent. Anomalously high groundwater elevations at MAFB-373C (at the southeast corner of the marsh) in 2013 are due to a breach o in the well casing allowing water to flow into the well from above the screen. Anomalously high water levels do not indicate regional groundwater mounding due to the marsh.

Based on the results of Site 7 performance monitoring data, the following activities are recommended for monitoring and system operations:

- Monitor flow rates at Site 7 extraction wells to maintain capture at the toe of the ACL plume.
- Decommission damaged monitoring well MAFB-373C.
- Collect samples during 2014 at planned frequencies using analytical methods outlined in the *2014 Mather Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

9.4 MAIN BASE/SAC AREA PLUME

A summary of activities and observations based on monitoring performed in 2013 are as follows:

- The MBSA extraction and treatment system consisted of 27 active extraction wells, the treatment plant, and 4 injection wells in 2013. The treatment plant treated an average of 1,483 gpm and removed approximately 80 pounds of VOCs from groundwater. The treated water was either injected into deep aquifer units, diverted to surface water, or used by the county for roadside irrigation. During 2013, the treatment system effluent and receiving water sampling results complied with discharge standards.
- The leading edge of the Southwest Lobe remained defined by multiple-completion monitoring wells MAFB-460Bs/Bd and MAFB-461Bs/Bd. Less than 1 percent of the area of Unit B TCE plume may be beyond capture by existing wells.
- Groundwater potentiometric surface maps indicate that the hot spots of the MBSA Plume within each HSG unit were captured. The majority of the ACL plume was being captured during 2013.
- The off-base PCE ACL plume increased in area between 2012 and 2013 as it appears it has been drawn toward MBS EW-6D.
- The CCl_4 ACL plume increased in area in 2012 as it appeared to be drawn toward MBS EW-6D, OFB-04, OFB-51, and OFB-52. In 2013, CCl_4 plume area and concentrations decreased and are still restricted to the upper part of Unit D.

Based on results of the evaluation of the MBSA monitoring data, the following activities are recommended for performance monitoring and system operations:

- MBS EW-1B, MBS EW-4B, MBS EW-5B, and MBS EW-6B should be shut down prior to the 2Q14 gauging and sampling event to provide 2Q14 data to confirm that COCs exceeding ACLs are captured by the remaining active extraction wells.
- With the exception of the increased sampling frequency (semiannual) recommended for MBS EW-1B, MBS EW-4B, MBS EW-5B, and MBS EW-6B, groundwater monitoring for 2014 will be conducted in accordance with the *2014 Groundwater Monitoring Program Sampling Plan* (URS, 2013c).
- Evaluate and optimize extraction well flow rates in 2014 to improve capture and optimize remediation of the MBSA Plume.

9.5 OFF-BASE WATER SUPPLY WELLS

A summary of activities and observation based on monitoring performed in 2013 are as follows:

- Ten high-volume off-base groundwater production wells were sampled in 2013 to monitor for evidence of VOC contaminants originating at Mather.
- Influent and mid-GAC samples were collected monthly for the wellhead treatment system at the Juvenile Hall supply wells. OFB-04 (Moonbeam) continued to operate with wellhead treatment in 2013 and influent samples were collected monthly. As in years past, CCl_4 was the primary contaminant detected at the Juvenile Hall and Moonbeam wells during 2013.
- The GAC treatment at the Juvenile Hall and Moonbeam groundwater treatment systems is effective and no carbon change-outs were necessary in 2013.

Samples were also collected from 31 privately owned water supply wells during 2013. Sixteen private wells were sampled for the first time in 2009 and another two for the first time in 2010; these 18 wells are downgradient from the Southwest Lobe of the MBSA Plume. Of those 18 wells, only OFB-72 had detectable concentrations of a COC in 2013; TCE was detected at a maximum concentration of 1.6 µg/L in 4Q13.

Based on 2013 monitoring results, continue to collect samples during 2014 at planned frequencies using analytical methods outlined in the *2014 Mather Groundwater Monitoring Program Sampling Plan* (URS, 2013c).

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TABLES

TABLE 2-1

Groundwater Well Reference List
Former Mather Air Force Base
Sacramento County, California

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
7-BV-01	PERCHED	73.48	72.45	13.45	3.45	SITE 7
7-BV-02	PERCHED	72.68	70.22	8.22	-6.78	SITE 7
7-BV-03	PERCHED	75.92	70.66	33.66	23.66	SITE 7
7-BV-04	PERCHED	76.72	69.94	20.94	5.94	SITE 7
7-BV-05	PERCHED	74.63	70.99	22.99	7.99	SITE 7
7-BV-06	PERCHED	71.84	72.88	18.88	8.88	SITE 7
7-BV-07	PERCHED	71.72	71.91	32.91	17.91	SITE 7
7-BV-08	PERCHED	78.46	71.38	26.88	6.88	SITE 7
7-BV-09	PERCHED	84.06	67.71	21.21	6.21	SITE 7
7-BV-10	PERCHED	82.25	67.89	30.89	15.89	SITE 7
7-BV-11	PERCHED	76.22	71.23	25.23	10.23	SITE 7
7-BV-12	PERCHED	76.45	74.18	26.18	11.18	SITE 7
7-BV-13	PERCHED	75.51	74.90	34.90	19.90	SITE 7
7-BV-14	PERCHED	73.90	72.77	20.77	5.77	SITE 7
7-BV-15	PERCHED	81.58	67.30	25.30	5.30	SITE 7
7-BV-16	PERCHED	78.61	66.22	18.22	3.22	SITE 7
7-BV-17	PERCHED	71.86	73.69	25.69	10.69	SITE 7
7-BV-18	PERCHED	76.90	76.84	19.84	9.84	SITE 7
7-BV-19	PERCHED	75.77	68.32	16.32	6.32	SITE 7
7-BV-20	PERCHED	76.42	68.25	9.25	-0.75	SITE 7
7-BV-21	PERCHED	73.35	73.21	17.21	9.21	SITE 7
7-BV-22	PERCHED	76.33	76.61	43.61	28.61	SITE 7
7-BV-23	PERCHED	77.15	77.14	16.64	6.64	SITE 7
7-BV-24	PERCHED	74.77	72.04	7.04	-2.96	SITE 7
7-EW-1	B	43.51	41.31	-70.69	-118.69	SITE 7
7-EW-2	B	54.13	51.53	-23.47	-63.47	SITE 7
7-IW-01	B	76.40	75.65	-29.35	-89.35	SITE 7
7-IW-02	B	78.53	78.01	-26.99	-86.99	SITE 7
7-IW-03	B	79.51	79.01	-20.99	-80.99	SITE 7
7-IW-04	B	79.95	79.25	-25.75	-52.75	SITE 7
7-PZ-23	B	80.11	77.70	-41.30	-51.30	SITE 7
7-PZ-24	B	78.64	76.20	-43.80	-54.20	SITE 7
7-PZ-25	B	80.38	78.00	-41.25	-51.25	SITE 7
7-PZ-26	B	78.24	78.30	-36.70	-46.70	SITE 7
7-PZ-37	WT	75.80	73.50	-6.20	-22.20	SITE 7
7-PZ-37P	PERCHED	75.63	73.50	26.00	11.00	SITE 7
7-PZ-38P	PERCHED	56.99	53.89	28.89	13.89	SITE 7
7-PZ-39	C	60.92	58.02	-79.98	-89.98	SITE 7
7-PZ-40	C	56.11	53.16	-21.84	-31.84	SITE 7
7-PZ-41	C	56.11	53.16	-46.84	-56.84	SITE 7
ACW AT-1	C	130.91	129.27	13.27	-36.73	AC&W
ACW AT-2	C	124.28	122.40	7.40	-47.60	AC&W
ACW AT-3	C	122.46	120.54	5.54	-49.46	AC&W
ACW AT-4	D	126.06	126.06	-73.94	-113.94	AC&W
ACW EW-1	C	125.17	124.02	8.02	-51.98	AC&W
ACW EW-2	C	122.47	121.31	1.31	-58.69	AC&W
ACW EW-3	C	125.41	124.26	-0.74	-60.74	AC&W
ACW EW-4	C	115.39	114.66	-15.34	-75.34	AC&W
ACW EW-5	C	114.52	113.11	-16.89	-76.89	AC&W
ACW EW-6	C	128.11	126.95	-3.05	-63.05	AC&W
ACW EW-6R	C	127.97	126.83	21.83	-58.17	AC&W
ACW IW-1	C	128.23	127.09	32.09	-47.91	AC&W
ACW IW-2	C	120.16	119.00	14.00	-56.00	AC&W

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
ACW IW-3	C	122.83	121.68	26.68	-53.32	AC&W
ACW IW-4	C	122.79	121.56	31.56	-58.44	AC&W
ACW IW-5	C	121.74	120.58	15.58	-54.42	AC&W
ACW IW-6	C	113.01	112.01	7.01	-72.99	AC&W
ACW IW-7	C	130.16	129.00	29.00	-51.00	AC&W
ACW IW-8	C	130.49	129.29	29.29	-50.71	AC&W
ACW PZ-01	C	109.03	108.91	-56.09	-71.09	AC&W
ACW PZ-02	C	110.25	110.10	-54.90	-69.90	AC&W
ACW PZ-03	C	116.68	116.58	-48.42	-63.42	AC&W
ACW PZ-04	C	108.35	108.35	-56.73	-71.73	AC&W
ACW PZ-05	C	115.20	114.47	-47.53	-62.53	AC&W
ACW PZ-06	WT/C	121.62	118.50	-1.50	-16.50	AC&W
ACW PZ-06C	C	121.62	118.50	-51.50	-61.50	AC&W
ACW PZ-07	WT/C	127.91	125.50	0.50	-14.50	AC&W
ACW PZ-07C	C	127.91	125.50	-44.50	-54.50	AC&W
ACW PZ-08	WT/C	123.75	121.00	3.00	-12.00	AC&W
ACW PZ-08C	C	123.75	121.00	-39.00	-49.00	AC&W
ACW PZ-09	WT/C	126.77	123.80	3.80	-11.20	AC&W
ACW PZ-09C	C	126.77	123.80	-36.20	-46.20	AC&W
ACW PZ-10	WT	129.19	126.70	6.70	-8.30	AC&W
ACW PZ-10C	C	129.19	126.70	-33.30	-43.30	AC&W
FFS MW15-6	D	79.60	79.60	-95.40	-100.40	MBP
MAFB-005*	WT/B	137.64	134.54	29.04	9.04	LF04
MAFB-006	WT/B	98.34	95.80	14.30	-3.70	MBP
MAFB-012	WT/B	96.52	95.37	18.37	-1.63	MBP
MAFB-013	WT/B	92.21	92.21	14.21	-5.79	MBP
MAFB-033	WT/Bu	80.88	80.88	6.88	-13.12	MBP
MAFB-039	PERCHED	75.00	72.71	8.71	-11.29	SITE 7
MAFB-041	B	73.64	72.28	-27.72	-47.72	SITE 7
MAFB-042	B	74.98	73.74	-16.26	-36.26	SITE 7
MAFB-043	C	75.15	73.24	-34.76	-54.76	SITE 7
MAFB-044	PERCHED	76.30	73.70	13.70	-6.30	SITE 7
MAFB-046	PERCHED	68.60	67.05	-2.95	-22.95	SITE 7
MAFB-047	WT/Bu	77.24	75.93	0.93	-19.07	MBP
MAFB-048	WT	75.63	74.26	4.26	-15.74	MBP
MAFB-053	C	131.33	130.15	-26.85	-46.85	AC&W
MAFB-054	WT/C	118.68	117.28	7.28	-12.72	AC&W
MAFB-056	D	74.17	72.33	-104.67	-124.67	SITE 7
MAFB-058	D	75.52	73.86	-97.14	-117.14	SITE 7
MAFB-059	B	69.62	67.53	-92.47	-112.47	SITE 7
MAFB-060	D	77.48	76.32	-98.68	-118.68	MBP
MAFB-061	D	78.43	77.37	-106.63	-126.63	MBP
MAFB-062	D	80.06	78.92	-102.08	-122.08	MBP
MAFB-063	D	76.09	74.60	-100.40	-120.40	MBP
MAFB-064*	D	134.9	133.76	-41.24	-61.24	LF04
MAFB-065*	D	136.74	134.8	-60.2	-80.2	LF04
MAFB-066	Dd	93.51	92.48	-154.52	-174.52	MBP
MAFB-067	D	129.41	127.88	-62.12	-82.12	AC&W
MAFB-068	D	131.44	129.27	-77.73	-97.73	AC&W
MAFB-069	D	133.87	133.87	-73.13	-93.13	AC&W
MAFB-070	D	123.60	122.25	-60.75	-80.75	AC&W
MAFB-071	D	131.48	129.87	-70.13	-90.13	AC&W
MAFB-072	D	117.07	116.00	-79.00	-99.00	AC&W
MAFB-073	B	92.76	91.62	-20.38	-40.38	MBP
MAFB-075*	WT/B	135.83	134.78	43.68	23.78	LF04
MAFB-078	D	126.64	123.89	-71.11	-86.11	AC&W
MAFB-080	D	121.52	118.72	-103.28	-118.28	AC&W
MAFB-082	WT/C	122.02	118.17	14.67	-0.33	AC&W
MAFB-090	WT/Bu	80.01	80.00	3.70	-11.30	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-092	WT	84.94	82.51	5.51	-9.49	MBP
MAFB-093	WT/B	93.38	93.38	6.38	-8.62	MBP
MAFB-094	B	90.41	90.51	-1.10	-16.10	MBP
MAFB-096	WT/B	92.72	92.93	5.93	-9.07	MBP
MAFB-097	WT/B	90.03	90.03	1.03	-13.97	MBP
MAFB-099	WT	84.72	84.71	7.71	-7.29	MBP
MAFB-101	B	83.61	80.68	-35.32	-50.32	MBP
MAFB-102	D	83.03	80.55	-107.45	-122.45	MBP
MAFB-103	D	74.82	72.36	-97.64	-112.64	MBP
MAFB-104	D	73.72	73.67	-122.33	-137.33	MBP
MAFB-105	WT	84.47	84.47	7.47	-7.53	MBP
MAFB-107	WT/B	96.88	96.78	5.48	-9.52	MBP
MAFB-108	WT/B	94.61	94.60	13.60	-1.40	MBP
MAFB-109*	WT/C	120.59	120.48	32.48	17.48	LF03
MAFB-110	WT/B	113.55	110.90	26.90	11.90	LF03
MAFB-111*	WT/B	127.65	125.53	22.53	7.53	LF03
MAFB-112	WT/C	121.09	118.26	15.26	-4.74	LF03
MAFB-115	WT/B	91.47	91.54	4.54	-10.46	MBP
MAFB-116	WT/B	89.94	89.94	3.94	-11.06	MBP
MAFB-121	WT	77.37	74.67	0.17	-14.83	MBP
MAFB-122	WT	73.44	73.42	2.42	-12.58	MBP
MAFB-123	WT	77.19	74.47	-0.53	-15.53	MBP
MAFB-124	WT	69.69	69.60	-0.40	-15.40	MBP
MAFB-125	WT/B	92.46	92.46	9.46	-5.54	MBP
MAFB-126	WT/B	94.22	94.22	8.22	-6.78	MBP
MAFB-127	WT/C	117.60	117.60	-0.40	-15.40	LF04
MAFB-128	WT/B	122.28	119.73	9.73	-5.27	LF04
MAFB-129	WT/C	116.93	116.93	3.93	-11.07	LF04
MAFB-130*	WT/B	114.99	112.98	29.98	14.98	LF03
MAFB-131*	WT/B	125.61	123.53	29.52	14.52	LF03
	C	125.61	123.53	4.03	-9.97	
MAFB-132*	WT/B	131.21	129.28	39.28	24.28	LF04
	C	131.21	129.28	14.28	-0.72	
MAFB-133*	WT/B	128.21	126.15	29.14	14.14	LF03
	C	128.21	126.15	3.65	-10.35	
MAFB-136*	WT/B	133.15	131.18	49.17	34.17	LF04
	C	133.15	131.18	23.68	9.68	
MAFB-139	WT/C	132.69	130.04	13.04	-1.96	LF04
MAFB-140*	WT/C	140.32	136.86	21.86	6.86	LF04
MAFB-141*	WT/B	139.14	137.2	46.19	31.19	LF04
	C	139.14	137.2	20.7	6.7	
MAFB-147	B	75.46	74.41	-29.56	-44.56	SITE 7
MAFB-148	B	77.04	74.41	-29.59	-44.59	SITE 7
MAFB-149	WT/B	74.53	71.93	-23.07	-38.07	SITE 7
MAFB-150	WT/B	94.02	91.50	8.50	-6.50	MBP
MAFB-151	WT/B	98.71	98.71	11.71	-3.29	MBP
MAFB-152	WT/B	89.80	89.76	3.76	-11.24	MBP
MAFB-154	WT/B	94.53	94.53	0.53	-14.47	MBP
MAFB-155	WT/B	92.20	92.20	-0.80	-15.80	MBP
MAFB-156	WT	74.92	74.95	-2.05	-17.05	MBP
MAFB-157	WT	74.15	71.44	-5.56	-20.56	MBP
MAFB-158	WT/Bu	79.44	77.06	0.06	-14.94	MBP
MAFB-159	WT	79.87	77.23	0.73	-14.27	MBP
MAFB-160	WT	84.89	82.35	7.35	-7.65	MBP
MAFB-162	WT	87.57	87.52	12.52	-2.48	MBP
MAFB-163	WT	91.66	87.66	11.66	-3.34	MBP
MAFB-164	B	76.31	74.13	-56.87	-71.87	MBP
MAFB-165	B	80.95	78.34	-50.16	-65.16	MBP
MAFB-166	B	79.94	77.18	-41.82	-56.82	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-167	B	78.42	75.99	-41.01	-56.01	MBP
MAFB-168	WT/Bu	75.15	72.78	-27.22	-42.22	MBP
MAFB-169	B	80.38	80.32	-46.68	-61.68	MBP
MAFB-170	B	79.76	79.76	-46.29	-61.29	MBP
MAFB-171	B	79.20	76.85	-40.15	-55.15	MBP
MAFB-172	WT/Bu	75.35	73.11	-19.89	-34.89	MBP
MAFB-173	B	77.35	74.74	-51.26	-66.26	MBP
MAFB-174	WT/Bu	79.59	76.93	-24.07	-39.07	MBP
MAFB-175	B	73.58	73.54	-63.46	-78.46	MBP
MAFB-176	Wt/Bu	76.90	74.30	-28.70	-43.70	MBP
MAFB-177	B	69.70	69.70	-67.30	-82.30	MBP
MAFB-178	D	95.46	95.40	-97.16	109.60	MBP
MAFB-179	D	97.34	94.69	-65.31	-80.31	MBP
MAFB-180	D	74.82	74.87	-97.13	-112.13	MBP
MAFB-181	D	74.13	71.42	-118.58	-133.58	MBP
MAFB-184	PERCHED	74.71	71.96	21.96	6.96	SITE 7
MAFB-185	PERCHED	75.62	72.95	20.95	5.95	SITE 7
MAFB-187	WT	86.74	84.14	8.14	-6.86	MBP
MAFB-188	WT	85.24	82.64	6.64	-8.36	MBP
MAFB-189	PERCHED	75.57	73.09	21.09	6.09	SITE 7
MAFB-191	D	125.24	125.14	-109.86	-124.86	AC&W
MAFB-193	C	125.99	123.58	-29.42	-44.42	AC&W
MAFB-194	C	126.71	124.04	-40.96	-55.96	AC&W
MAFB-195	C	120.40	118.42	-43.58	-58.58	AC&W
MAFB-196	C	122.37	119.58	-35.42	-50.42	AC&W
MAFB-197	WT/C	106.60	108.12	4.12	-10.88	AC&W
MAFB-198	C	106.27	107.48	-56.52	-71.52	AC&W
MAFB-199	WT/Bu	79.11	76.10	-3.90	-18.90	MBP
MAFB-200	WT	80.28	77.20	-2.80	-17.80	MBP
MAFB-201	WT/Bu	78.75	79.00	-1.00	-16.00	MBP
MAFB-202	WT	82.70	79.50	-0.50	-15.50	MBP
MAFB-203	WT	78.76	79.00	-1.00	-16.00	MBP
MAFB-204	WT	83.31	80.30	0.30	-14.70	MBP
MAFB-205	WT	80.54	77.40	-2.60	-17.60	MBP
MAFB-206	WT	80.62	77.60	1.60	-13.40	MBP
MAFB-207	WT	79.62	79.63	-0.51	-15.40	MBP
MAFB-208	WT	83.34	80.40	0.40	-14.60	MBP
MAFB-209	WT	82.53	79.70	1.70	-13.30	MBP
MAFB-210	WT	83.33	80.20	0.20	-14.80	MBP
MAFB-211	WT	78.93	75.70	-1.30	-16.30	MBP
MAFB-212	WT	86.36	83.40	3.40	-11.60	MBP
MAFB-214	WT	85.53	85.53	5.53	-9.47	MBP
MAFB-215	B	80.30	77.20	-57.80	-72.80	MBP
MAFB-216	B	78.98	78.90	-36.10	-51.10	MBP
MAFB-217	B	82.17	79.20	-40.80	-55.80	MBP
MAFB-218	B	79.05	79.10	-47.90	-62.90	MBP
MAFB-219	B	83.21	80.20	-44.80	-59.80	MBP
MAFB-220	B	80.67	77.40	-47.60	-62.60	MBP
MAFB-221	Bu	77.01	74.10	-23.90	-33.90	MBP
MAFB-222	B	78.84	75.90	-42.10	-57.10	MBP
MAFB-223	B	80.49	77.60	-42.40	-57.40	MBP
MAFB-224	B	79.38	79.70	-47.30	-62.30	MBP
MAFB-225	B	82.53	79.60	-36.40	-51.40	MBP
MAFB-226	B	82.85	79.80	-41.20	-56.20	MBP
MAFB-227	B	81.72	78.80	-41.20	-56.20	MBP
MAFB-228	B	86.45	83.30	-36.70	-51.70	MBP
MAFB-229	B	84.21	84.50	-30.50	-45.50	MBP
MAFB-230	B	85.10	85.10	-25.90	-40.90	MBP
MAFB-231	B	85.71	86.00	-24.00	-39.00	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-232	B	90.15	90.40	-4.60	-19.60	MBP
MAFB-233	B	93.61	93.50	-3.50	-18.50	MBP
MAFB-234	B	89.12	86.10	-19.60	-33.90	MBP
MAFB-235	D	81.90	78.90	-81.10	-91.10	MBP
MAFB-239	D	79.28	76.20	-103.80	-118.80	MBP
MAFB-240	D	79.40	76.50	-108.50	-123.50	MBP
MAFB-241	D	80.39	77.50	-122.50	-137.50	MBP
MAFB-242	D	78.98	76.00	-91.00	-106.00	MBP
MAFB-243	D	77.04	74.40	-135.60	-145.60	MBP
MAFB-244	WT	85.76	85.80	4.80	-10.20	MBP
MAFB-246	WT/Bu	84.51	84.51	-5.50	-15.50	MBP
MAFB-247	WT/B	79.18	79.20	-37.80	-52.80	MBP
MAFB-248	WT/B	80.69	80.60	-29.40	-44.40	MBP
MAFB-249	B	86.15	86.20	-23.80	-38.80	MBP
MAFB-250	D	85.77	85.60	-101.40	-116.40	MBP
MAFB-251	WT	75.66	75.60	1.60	-13.40	MBP
MAFB-258	WT/Bu	71.51	71.50	-18.50	-33.50	MBP
MAFB-259	Bu	71.69	69.00	-32.00	-37.00	MBP
MAFB-260	Bu	66.37	63.87	-23.13	-33.13	MBP
MAFB-261	Bu	68.91	69.00	-36.00	-51.00	MBP
MAFB-263	Bu	69.30	69.40	-34.60	-44.60	MBP
MAFB-264	WT/Bu	81.34	78.90	-11.10	-26.10	MBP
MAFB-265	B	84.70	84.70	-38.80	-53.80	MBP
MAFB-266	B	75.44	72.90	-62.60	-77.60	MBP
MAFB-267	B	72.02	69.30	-78.70	-93.70	MBP
MAFB-268	B	69.28	63.30	-68.70	-83.70	MBP
MAFB-269	B	68.92	69.00	-81.00	-96.00	MBP
MAFB-270	B	65.41	65.50	-95.50	-110.50	MBP
MAFB-271	B	65.27	65.20	-78.80	-93.80	MBP
MAFB-272	B	74.38	74.38	-67.12	-82.12	MBP
MAFB-273	B	75.71	75.70	-45.30	-60.30	MBP
MAFB-274	B	84.88	82.50	-30.50	-45.50	MBP
MAFB-276	WT/B	86.72	86.70	-3.80	-13.80	NEP
MAFB-277	WT/B	88.10	88.10	0.60	-14.40	NEP
MAFB-278	WT/B	94.04	94.00	12.00	2.00	NEP
MAFB-280	B	91.91	91.90	-17.10	-27.10	MBP
MAFB-281	B	90.31	90.30	-9.70	-24.70	MBP
MAFB-282	B	86.48	86.50	-13.50	-28.50	MBP
MAFB-283	B	77.96	75.00	-54.00	-69.00	SITE 7
MAFB-284	B	76.20	73.30	-41.70	-56.70	SITE 7
MAFB-285	C	70.80	70.80	-34.30	-49.20	SITE 7
MAFB-288*	B	127.01	124.78	-13.22	-28.22	LF04
MAFB-289*	WT/B	106.41	106.4	27.4	12.4	LF03
MAFB-290	D	68.50	68.20	-127.80	-137.80	MBP
MAFB-291	D	74.39	74.34	-98.66	-113.66	MBP
MAFB-292	D	75.71	75.70	-99.30	-114.30	MBP
MAFB-293	D	65.35	65.40	-165.60	-180.60	MBP
MAFB-294*	D	135.65	133.47	-61.53	-76.53	LF04
MAFB-296	D	68.19	68.20	-96.80	-106.80	MBP
MAFB-297	C	39.74	36.60	-68.90	-83.90	SITE 7
MAFB-300	C	41.18	39.00	-33.00	-43.00	SITE 7
MAFB-301	C	125.27	125.17	-37.83	-52.83	AC&W
MAFB-302	C	108.07	107.95	-47.55	-62.55	AC&W
MAFB-303	C	116.28	116.14	-46.86	-61.86	AC&W
MAFB-304	C	120.75	120.72	-34.28	-49.28	AC&W
MAFB-305	C	108.85	108.19	-51.81	-66.81	AC&W
MAFB-306	C	124.64	124.13	-30.87	-45.87	AC&W
MAFB-308	B	81.56	81.56	-28.44	-43.44	MBP
MAFB-309	B	69.56	69.64	-75.36	-90.36	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-310	B	63.99	63.92	-91.08	-106.08	MBP
MAFB-311	B	59.08	59.08	-104.92	-119.92	MBP
MAFB-312	B	70.21	70.21	-124.79	-139.79	MBP
MAFB-313	B	74.08	74.08	-79.92	-94.92	MBP
MAFB-314	D	81.61	81.63	-93.37	-108.37	MBP
MAFB-315	D	69.54	69.61	-129.39	-139.39	MBP
MAFB-316	D	63.9	63.86	-161.14	-176.14	MBP
MAFB-317	D	59.12	59.12	-175.88	-185.88	MBP
MAFB-318	D	70.43	70.43	-174.57	-184.57	MBP
MAFB-319	D	65.51	65.50	-134.55	-149.55	MBP
MAFB-320	D	81.75	81.75	-123.25	-138.25	MBP
MAFB-321	Dd	65.40	65.40	-174.60	-184.60	MBP
MAFB-322	B	58.86	58.86	-114.14	-129.14	MBP
MAFB-323	B	69.32	69.32	-122.68	-132.68	MBP
MAFB-324	B	65.24	65.24	-82.26	-97.26	MBP
MAFB-325	B	68.59	68.58	-81.42	-96.42	MBP
MAFB-326	D	58.91	58.91	-170.09	-185.09	MBP
MAFB-327	D	69.48	69.48	-184.02	-199.02	MBP
MAFB-328	D	65.23	65.28	-124.72	-134.72	MBP
MAFB-329	D	68.59	68.64	-126.36	-136.36	MBP
MAFB-330	B	70.8	70.70	-124.30	-139.30	MBP
MAFB-331	B	70.99	71.00	-124.00	-139.00	MBP
MAFB-332	D	70.68	70.63	-147.37	-154.37	MBP
MAFB-336	D	69.92	69.87	-200.13	-210.13	MBP
MAFB-337	Dd	58.80	57.01	-279.99	-289.99	MBP
MAFB-338	Dd	65.00	65.00	-245.00	-255.00	MBP
MAFB-339	WT/B	86.76	86.80	11.80	-8.20	MBP
MAFB-340	WT/B	89.14	89.16	11.16	-8.84	MBP
MAFB-341	WT/B	86.92	86.92	8.92	-11.08	MBP
MAFB-342	WT/B	88.44	87.70	9.70	-10.30	MBP
MAFB-343	WT/B	87.88	87.32	12.32	-7.68	MBP
MAFB-344	WT/B	89.85	89.65	11.65	-8.35	MBP
MAFB-345	Dd	67.33	67.72	-315.28	-325.28	MBP
MAFB-346Bd	B	67.13	67.73	-122.11	-132.27	MBP
MAFB-346Bs	B	67.32	67.73	-70.67	-80.67	MBP
MAFB-346D	D	67.04	67.73	-177.27	-187.27	MBP
MAFB-347	LMT	68.73	68.73	-422.27	-432.27	MBP
MAFB-348B	B	68.55	68.55	-101.45	-111.45	MBP
MAFB-348Dd	Dd	68.55	68.55	-245.45	-255.45	MBP
MAFB-348Ds	D	68.55	68.55	-171.45	-181.45	MBP
MAFB-349	LMT	69.80	69.79	-365.22	-375.22	MBP
MAFB-350	LMT	64.94	64.94	-371.06	-381.06	MBP
MAFB-351Bd	B	64.61	64.61	-143.39	-153.39	MBP
MAFB-351Bs	B	64.61	64.61	-66.89	-76.89	MBP
MAFB-351D	D	64.61	64.61	-191.39	-201.39	MBP
MAFB-352D	Dd	67.67	67.67	-228.33	-238.33	MBP
MAFB-352LM	LMT	67.75	67.62	-382.38	-392.38	MBP
MAFB-353	LMT	68.33	68.33	-361.67	-371.67	MBP
MAFB-354B	B	68.22	68.22	-136.78	-146.78	MBP
MAFB-354D	D	68.22	68.22	-221.78	-231.78	MBP
MAFB-355B	B	54.60	54.60	-133.40	-143.40	MBP
MAFB-355D	D	54.60	54.60	-228.70	-238.70	MBP
MAFB-356B	B	67.58	67.58	-138.42	-148.42	MBP
MAFB-356Dd	Dd	67.58	67.58	-284.42	-294.42	MBP
MAFB-356Ds	D	67.58	67.58	-232.42	-242.42	MBP
MAFB-357D	D	89.43	89.43	-80.57	-90.57	MBP
MAFB-357Dd	Dd	89.44	89.43	-170.57	-180.57	MBP
MAFB-357Ds	D	89.44	89.43	-120.57	-130.57	MBP
MAFB-358B	B	88.59	87.60	-37.40	-47.40	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-358D	D	88.61	87.60	-82.40	-92.40	MBP
MAFB-359	WT/Bu	77.84	76.43	2.93	-37.07	MBP
MAFB-360	B	80.45	77.25	-63.75	-73.75	MBP
MAFB-361	B	77.55	77.35	-47.65	-57.65	MBP
MAFB-362	B	80.44	80.34	-56.66	-66.66	MBP
MAFB-363	B	78.64	75.84	-59.16	-69.16	MBP
MAFB-364B	B	74.47	74.47	-75.53	-85.53	MBP
MAFB-364D	D	74.47	74.47	-118.53	-128.53	MBP
MAFB-365B	B	72.61	72.96	-82.04	-92.04	MBP
MAFB-365D	D	72.61	72.96	-127.04	-137.04	MBP
MAFB-366B	B	69.28	69.28	-80.72	-90.72	MBP
MAFB-366D	D	69.28	69.28	-110.72	-120.72	MBP
MAFB-367	D	70.42	70.42	-145.08	-155.08	MBP
MAFB-368B	B	67.13	67.13	-102.87	-112.87	MBP
MAFB-368D	D	67.13	67.13	-172.87	-182.87	MBP
MAFB-369	D	69.72	69.72	-138.40	-148.40	MBP
MAFB-371C	C	43.84	38.86	-51.6	-66.74	SITE 7
MAFB-371D	D	43.84	38.86	-104.6	-114.6	SITE 7
MAFB-372B	B	46.74	41.74	-49.69	-64.69	SITE 7
MAFB-372D	D	46.74	41.74	-86.69	-96.69	SITE 7
MAFB-373C	C	47.10	43.63	-42.56	-63.36	SITE 7
MAFB-373D	D	47.10	43.63	-87.56	-103.36	SITE 7
MAFB-374	D	90.78	86.32	-83.68	-93.68	MBP
MAFB-375	D	67.61	67.61	-102.39	-112.39	MBP
MAFB-376	D	56.17	56.17	-123.83	-133.83	MBP
MAFB-377	D	75.14	75.14	-119.36	-129.36	MBP
MAFB-378B	B	81.48	81.48	-32.52	-42.52	MBP
MAFB-378D	D	81.48	81.48	-88.52	-98.52	MBP
MAFB-379B	B	69.42	69.42	-80.58	-90.58	MBP
MAFB-379D	D	69.42	69.42	-140.58	-150.58	MBP
MAFB-380B	B	66.20	66.20	-98.30	-108.30	MBP
MAFB-380D	D	66.20	66.20	-141.80	-151.80	MBP
MAFB-381B	B	72.72	70.00	-70.00	-80.00	MBP
MAFB-381D	D	72.72	70.00	-165.00	-175.00	MBP
MAFB-382B	B	69.13	69.13	-85.87	-100.87	MBP
MAFB-382D	D	69.13	69.13	-175.87	-185.87	MBP
MAFB-383B	B	75.63	72.58	-72.42	-82.42	MBP
MAFB-383D	D	75.64	72.58	-137.42	-147.42	MBP
MAFB-384B	B	87.76	87.76	1.76	-18.24	MBP
MAFB-384D	D	87.76	87.76	-77.24	-87.24	MBP
MAFB-385B	B	62.32	62.32	-109.68	-119.68	MBP
MAFB-385D	D	62.32	62.32	-159.68	-169.68	MBP
MAFB-386B	B	69.73	69.40	-100.60	-110.60	MBP
MAFB-386D	D	69.73	69.40	-180.60	-190.60	MBP
MAFB-387B	B	70.11	70.25	-119.75	-139.75	MBP
MAFB-387Dd	D	70.11	70.25	-259.75	-269.75	MBP
MAFB-387Ds	D	70.11	70.25	-214.75	-224.75	MBP
MAFB-388B	B	62.77	62.77	-132.23	-142.23	MBP
MAFB-388Dd	D	62.77	62.77	-267.23	-277.23	MBP
MAFB-388Ds	D	62.77	62.77	-222.23	-232.23	MBP
MAFB-389	WT/B	96.99	93.84	3.84	-21.16	NEP
MAFB-390	WT/B	93.50	90.62	0.62	-24.38	NEP
MAFB-391	C	74.68	71.88	-33.12	-43.12	SITE 7
MAFB-392	C	56.99	53.89	-26.11	-36.11	SITE 7
MAFB-393	C	56.17	52.77	-22.23	-32.23	SITE 7
MAFB-394	C	55.17	51.87	-22.13	-32.13	SITE 7
MAFB-395	C	58.83	55.43	-22.57	-37.57	SITE 7
MAFB-396	B	60.92	58.02	-31.98	-46.98	SITE 7
MAFB-397	Dd	81.26	81.26	-153.74	-163.74	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-398*	WT/B	128.67	125.85	8.85	3.85	LF03
MAFB-398C*	C	126.67	125.85	-23.65	-33.65	LF03
MAFB-399*	C	125.3	122.77	-27.23	-37.23	NEP
MAFB-400*	C	134.39	131.79	-13.21	-23.21	NEP
MAFB-401	WT/C	128.44	125.80	20.80	-9.20	AC&W
MAFB-402	WT/C	135.66	133.00	18.00	-12.00	AC&W
MAFB-403	WT/C	132.21	129.30	19.30	-10.70	AC&W
MAFB-404	WT/B	89.35	89.30	2.30	-17.70	MBP
MAFB-405	WT/B	88.28	88.28	0.28	-19.72	MBP
MAFB-406	WT/B	81.42	81.42	-1.58	-16.58	MBP
MAFB-407	WT/Bu	85.57	85.50	-5.00	-15.00	MBP
MAFB-408	WT/C	126.99	127.00	20.00	-10.00	AC&W
MAFB-409	WT/B	80.66	80.50	-5.00	-20.00	NEP
MAFB-410	WT/A	84.49	81.50	-3.50	-18.50	MBP
MAFB-411	WT/B	79.67	79.62	-8.38	-23.38	MBP
MAFB-412	WT/B	82.81	79.92	-6.18	-24.09	MBP
MAFB-413	WT/B	78.08	75.03	-10.92	-25.92	SITE 7
MAFB-414	WT	83.86	84.68	16.86	-18.14	MBP
MAFB-415	WT/B	87.61	87.46	-5.54	-25.54	MBP
MAFB-416	WT/B	88.44	88.35	1.35	-18.65	MBP
MAFB-417	WT/B	82.66	80.06	-13.94	-28.94	MBP
MAFB-418	WT	81.67	81.59	-12.91	-26.91	MBP
MAFB-419	WT/B	84.62	82.52	-1.48	-21.48	MBP
MAFB-420	WT	80.81	80.69	-14.31	-29.31	MBP
MAFB-421	WT/B	84.88	84.83	-8.17	-23.17	MBP
MAFB-422	WT/Bu	82.00	81.85	-12.15	-27.15	MBP
MAFB-423	WT/Bu	78.52	78.60	-16.40	-36.40	MBP
MAFB-423B	B	78.52	78.60	-74.40	-89.40	MBP
MAFB-424	WT/C	80.54	78.07	-13.93	-28.93	SITE 7
MAFB-425	WT	69.57	69.24	-17.76	-32.76	MBP
MAFB-426	B	64.86	64.86	-135.14	-145.14	MBP
MAFB-427	B	66.62	66.57	-133.43	-143.43	MBP
MAFB-428	WT/B	88.53	86.07	-9.93	-25.93	MBP
MAFB-429Bd	B	70.86	70.86	-92.14	-107.14	MBP
MAFB-429Bs	B	70.86	70.86	-62.14	-77.14	MBP
MAFB-429Bu	WT/Bu	70.86	70.86	-34.14	-44.14	MBP
MAFB-430	LMT	80.55	77.54	-183.46	-193.46	MBP
MAFB-431Bd	Bd	69.79	69.79	-98.20	-113.20	MBP
MAFB-431Dd	Dd	69.79	69.79	-158.2	-168.2	MBP
MAFB-431Ds	Ds	69.79	69.79	-134.40	-144.20	MBP
MAFB-432	WT/C	126.47	123.43	-11.57	-26.57	AC&W
MAFB-433	WT/C	112.84	112.84	-17.16	-32.16	AC&W
MAFB-434Bd	Bd	69.79	66.99	-107.01	-117.01	MBP
MAFB-434Bs	Bs	69.79	66.99	-76.01	-91.01	MBP
MAFB-434Bu	WT/Bu	69.79	66.99	-38.01	-53.01	MBP
MAFB-435	Dd	74.75	74.75	-175.25	-185.25	MBP
MAFB-436	WT	83.10	83.10	-9.40	-24.40	MBP
MAFB-437Dd	Dd	66.78	66.78	-228.22	-263.22	MBP
MAFB-437Ds	Ds	66.78	66.78	-118.22	-143.22	MBP
MAFB-438*	WT	137.59	134.74	15.74	0.74	NEP
MAFB-439	WT	86.20	83.20	-6.80	-21.80	MBP
MAFB-440	WT	78.17	74.90	-15.10	-30.10	MBP
MAFB-440P	PERCHED	78.17	74.90	24.90	14.90	SITE 7
MAFB-441	D	79.93	79.90	-129.10	-139.10	SITE 7
MAFB-442	D	83.33	80.30	-179.70	-189.70	MBP
MAFB-443	D	70.46	70.40	-195.60	-205.60	MBP
MAFB-444	B	55.65	52.90	-40.10	-50.10	SITE 7
MAFB-445	B	48.12	45.10	-48.90	-58.90	SITE 7
MAFB-446	C	50.17	47.10	-37.90	-52.90	SITE 7

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MAFB-447	C	44.71	41.80	-43.20	-58.20	SITE 7
MAFB-448	B	49.34	45.90	-39.10	-54.10	SITE 7
MAFB-449Bd	Bd	52.72	49.30	-110.70	-120.70	MBP
MAFB-449Bs	Bs	52.72	49.30	-69.70	-84.70	MBP
MAFB-450	WT/Bu	75.43	72.00	-27.00	-42.00	MBP
MAFB-451	B	71.41	71.30	-58.70	-73.70	MBP
MAFB-452B	B	74.41	74.30	-63.70	-78.70	MBP
MAFB-452Bu	WT/Bu	74.41	74.30	-20.70	-35.70	MBP
MAFB-453	WT	122.16	119.10	-7.90	-22.90	AC&W
MAFB-453C	C	122.16	119.10	-40.90	-50.90	AC&W
MAFB-454	WT	125.71	122.50	-9.50	-24.50	AC&W
MAFB-454C	C	125.71	122.50	-33.50	-48.50	AC&W
MAFB-455	WT	119.67	119.70	-15.30	-30.30	AC&W
MAFB-456	WT	124.32	124.30	-13.70	-28.70	AC&W
MAFB-456C	C	124.32	124.30	-43.70	-53.70	AC&W
MAFB-457Bd	Bd	44.08	41.00	-121.00	-131.00	MBP
MAFB-457Bs	Bs	44.08	41.00	-80.00	-95.00	MBP
MAFB-458Bd	Bd	37.66	34.70	-117.30	-132.30	MBP
MAFB-458Bs	Bs	37.66	34.70	-80.30	-95.30	MBP
MAFB-459D	D	62.99	63.00	-197.00	-212.00	MBP
MAFB-459Dd	Dd	62.99	63.00	-257.00	-267.00	MBP
MAFB-460Bd	Bd	58.62	58.50	-121.50	-131.50	MBP
MAFB-460Bs	Bs	58.62	58.50	-93.50	-108.50	MBP
MAFB-461Bd	Bd	70.36	70.30	-137.70	-147.70	MBP
MAFB-461Bs	Bs	70.36	70.30	-106.70	-121.70	MBP
MAFB-462	D	60.34	60.64	-171.36	-181.36	MBP
MAFB-463D	D	72.57	72.95	-141.05	-151.05	MBP
MAFB-463Dd	Dd	72.62	72.95	-197.05	-207.05	MBP
MAFB-464	B	48.5	46.25	-57.75	-67.75	SITE 7
MAFB-465	WT/C	131.01	128.15	8.15	-6.85	LF04
MBS 19EW01	B	84.37	81.70	-105.50	-145.50	MBP
MBS 19MW01	Bu	83.90	81.20	-28.80	-43.80	MBP
MBS 19MW02	Bu	82.89	80.20	-28.80	-43.80	MBP
MBS 19MW03	D	83.28	80.40	-94.60	-109.60	MBP
MBS 19MW04	D	83.06	80.10	-94.40	-109.40	MBP
MBS 39ABuB	WT/B	80.82	85.58	11.58	-38.42	MBP
MBS 39EW02	B	88.68	85.53	-23.02	-38.02	MBP
MBS 39MW01	WT	85.50	85.50	5.50	-9.50	MBP
MBS 39MW02	WT	85.51	85.51	5.51	-9.49	MBP
MBS 39MW03	Bu	85.30	85.30	-17.70	-32.70	MBP
MBS 39MW04	Bu	85.40	85.40	-14.60	-29.60	MBP
MBS EW-10B	B	65.11	69.62	-70.38	-110.38	MBP
MBS EW-11B	B	63.49	68.05	-81.95	-121.95	MBP
MBS EW-12AB	WT/B	84.36	88.57	-1.43	-41.43	MBP
MBS EW-13BuB	Bu	71.32	69.97	-30.03	-45.03	MBP
	Bs	71.32	69.97	-70.03	-85.03	MBP
	Bd	71.32	69.97	-94.03	-114.03	MBP
MBS EW-1A	WT	81.93	87.73	14.73	-5.27	MBP
MBS EW-1B	B	76.27	75.70	-23.30	-63.30	MBP
MBS EW-1Bu	WT/Bu	75.23	74.44	-9.56	-29.56	MBP
MBS EW-1D	D	83.87	82.00	-74.5	-104.5	MBP
MBS EW-2A	WT	74.53	79.63	2.63	-17.37	MBP
MBS EW-2B	B	78.58	83.67	-54.33	-79.33	MBP
MBS EW-2AR	WT/A	77.77	78.91	-9.09	-39.09	MBP
MBS-EW2Bu	Bu	73.92	79.13	-8.87	-33.87	MBP
MBS EW-2D	D	75.43	74.89	-105.11	-145.11	MBP
MBS EW-3A	WT	75.54	80.73	3.73	-16.27	MBP
MBS EW-3B	B	76.39	80.93	-24.07	-84.07	MBP
MBS EW-3Bu	Bu	74.38	74.11	-20.89	-35.89	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MBS EW-3D	D	79.41	77.79	-85.21	-125.21	MBP
MBS EW-4A	WT/B	82.13	87.11	10.11	-29.89	MBP
MBS EW-4B	B	76.59	75.16	-44.84	-74.84	MBP
MBS EW-4Bu	WT/Bu	76.36	74.06	-10.94	-50.94	MBP
MBS EW-4D	D	82.06	86.28	-78.72	-103.72	MBP
MBS EW-5A	WT/B	83.45	88.59	9.59	-30.41	MBP
MBS EW-5B	B	65.88	71.28	-65.72	-95.72	MBP
MBS EW-5D	D	68.16	69.83	-107.17	-142.17	MBP
MBS EW-6B	B	68.84	74.09	-75.91	-115.91	MBP
MBS EW-6D	D	63.51	67.93	-156.07	-181.07	MBP
MBS EW-7B	B	77.29	77.29	-47.71	-87.71	MBP
MBS EW-8B	B	67.53	72.70	-33.30	-63.30	MBP
MBS EW-9B	B	76.53	74.58	-45.42	-85.42	MBP
MBS EW1ABu	WT/Bu	81.00	79.37	4.37	-30.63	MBP
MBS EW2ABu	WT/Bu	75.62	80.04	5.04	-34.96	MBP
MBS EW4ABu	WT/Bu	74.21	79.28	4.28	-35.72	MBP
MBS EW5ABu	WT/Bu	73.79	79.04	3.04	-36.96	MBP
MBS EW6ABu	WT	81.75	79.78	-2.22	-42.22	MBP
MBS EW7ABu	WT/Bu	85.57	86.83	-4.17	-34.17	MBP
MBS IW-501	LMT	87.06	84.71	-255.29	-315.29	MBP
MBS IW-502	LMT	86.57	84.05	-265.95	-325.95	MBP
MBS IW-503	LMT	85.54	83.69	-266.31	-326.31	MBP
MBS IW-504	LMT	81.21	81.21	-278.79	-378.79	MBP
MBS PZ-01	WT	79.76	79.80	-4.20	-14.20	MBP
MBS PZ-04	WT	80.14	80.60	-4.40	-14.40	MBP
MBS PZ-05	B	78.87	76.50	-48.50	-58.50	MBP
MBS PZ-06	B	79.85	77.40	-47.60	-57.60	MBP
MBS PZ-07	B	83.48	83.90	-51.10	-61.10	MBP
MBS PZ-08	B	84.41	84.90	-60.10	-70.10	MBP
MBS PZ-09	B	87.42	87.46	-21.54	-31.54	MBP
MBS PZ-10	B	87.7	87.70	-21.30	-31.30	MBP
MBS PZ-11	B	62.27	62.30	-55.70	-65.70	MBP
MBS PZ-12	LMT	84.48	84.80	-295.20	-305.20	MBP
MBS PZ-13	Dd	83.33	84.00	-166.00	-176.00	MBP
MBS PZ-14	LMT	83.00	83.60	-286.40	-301.40	MBP
MBS PZ-15	LMT	81.67	82.20	-290.80	-300.80	MBP
MBS PZ-16	B	82.16	82.60	-47.40	-57.40	MBP
MBS PZ-17	D	76.86	74.50	-123.50	-133.50	MBP
MBS PZ-18	D	77.02	74.80	-122.20	-132.20	MBP
MBS PZ-19	WT	82.06	79.60	-15.40	-25.40	MBP
MBS PZ-20	Bu	79.42	76.90	-21.60	-31.60	MBP
MBS PZ-21	WT/Bu	76.43	73.90	-15.30	-25.30	MBP
MBS PZ-22	WT/Bu	77.43	75.20	-16.00	-26.00	MBP
MBS PZ-37	B	73.32	73.32	-96.68	-106.68	MBP
MBS PZ-38	B	73.68	73.68	-74.32	-93.32	MBP
MBS PZ-39	B	70.86	70.86	-77.14	-87.14	MBP
MBS PZ-40	B	71.37	71.37	-55.63	-65.63	MBP
MBS PZ-41	B	74.05	74.05	-51.45	-61.45	MBP
MBS PZ-42D	B	71.37	71.37	-95.63	-105.63	MBP
MBS PZ-42S	B	71.37	71.37	-39.63	-49.63	MBP
MBS PZ-43	B	77.93	75.00	-55.00	-65.00	MBP
MBS PZ-44	B	77.63	77.63	-23.37	-33.37	MBP
MBS PZ-46	B	79.20	79.20	-30.30	-40.30	MBP
MBS PZ-47	B	79.82	79.60	-30.40	-40.40	MBP
MBS PZ-48D	B	82.15	81.80	-73.20	-83.20	MBP
MBS PZ-48S	B	82.15	81.80	-38.20	-48.20	MBP
MBS PZ-49D	LMT	80.29	80.29	-285.71	-295.71	MBP
MBS PZ-49S	B	80.29	80.29	-46.71	-56.71	MBP
MBS PZ-50D	LMT	83.48	83.48	-298.52	-308.52	MBP

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
MBS PZ-50S	Dd	83.48	83.48	-81.52	-91.52	MBP
MBS PZ-51	D	81.01	78.36	-93.64	-103.64	MBP
MBS PZ-52	D	85.95	83.56	-90.44	-100.44	MBP
MBS PZ-53	D	86.05	83.02	-101.98	-116.98	MBP
MBS PZ-54	D	80.37	80.37	-95.63	-105.63	MBP
MBS PZ-55B	B	76.39	73.30	-68.70	-78.70	MBP
MBS PZ-55Bu	Bu	76.39	73.30	-26.70	-36.70	MBP
MBS PZ-57B	B	90.86	86.43	-27.20	-37.20	MBP
MBS PZ-57D	D	90.35	86.43	-83.57	-93.57	MBP
MBS PZ-58	D	71.06	86.27	-99.23	-109.23	MBP
MBS PZ-59	WT/A	67.98	71.06	-8.94	-23.94	MBP
MBS PZ-59B	WT/A	67.98	71.06	-12.02	-27.02	MBP
MB-1	NA	UNK	UNK	262.00	517.00	ON-BASE SUPPLY WELL
MB-2	NA	UNK	UNK	186.00	476.00	ON-BASE SUPPLY WELL
MB-3	NA	UNK	UNK	294.00	489.00	ON-BASE SUPPLY WELL
MB-4	NA	UNK	UNK	246.00	490.00	ON-BASE SUPPLY WELL
OFB-03	Dd/LMT	UNK	UNK	UNK	UNK	OFB - (Granite)
OFB-04	D/Dd/LMT	UNK	UNK	UNK	UNK	OFB- (CalAm; Moonbeam)
OFB-06	NA	UNK	UNK	UNK	UNK	OFB - (private; 4294 HL)
OFB-07	NA	UNK	UNK	UNK	UNK	OFB - (private; 4274 HL)
OFB-08	NA	UNK	UNK	UNK	UNK	OFB - (private; 4122 HL)
OFB-09	NA	UNK	UNK	UNK	UNK	OFB - (private; 4095 HL)
OFB-10	NA	UNK	UNK	UNK	UNK	OFB - (private; 4075 HL)
OFB-11	NA	UNK	UNK	UNK	UNK	OFB- (private; 4070 HL)
OFB-12	NA	UNK	UNK	UNK	UNK	OFB - (private; 4016 HL)
OFB-17	NA	UNK	UNK	UNK	UNK	OFB - (private; 3900 HL)
OFB-20	NA	UNK	UNK	UNK	UNK	OFB - (private; Camellia)
OFB-22	NA	UNK	UNK	UNK	UNK	OFB - (private; 9910 OPR)
OFB-23	NA	UNK	UNK	UNK	UNK	OFB - (private; 9960 OPR)
OFB-24	NA	UNK	UNK	UNK	UNK	OFB - (private; 9970 OPR)
OFB-27	D	UNK	UNK	UNK	UNK	OFB - (CalAm; Mars)
OFB-30	NA	UNK	UNK	UNK	UNK	OFB - (private; Ellenwood)
OFB-31	D/LMT	UNK	UNK	UNK	UNK	OFB - (CalAm; Gould)
OFB-32	D/LMT	UNK	UNK	UNK	UNK	OFB - (CalAm; Nut Plains)
OFB-39	NA	UNK	UNK	UNK	UNK	OFB - (Teichert; 9760 JH)
OFB-40	NA	UNK	UNK	UNK	UNK	OFB - (private; 9880 JH)
OFB-41	NA	UNK	UNK	UNK	UNK	OFB - (private; 9890 JH)
OFB-42	NA	UNK	UNK	UNK	UNK	OFB - (Teichert; between 9932 and
OFB-43	NA	UNK	UNK	UNK	UNK	OFB - (Teichert; 9932 JH)
OFB-44	NA	UNK	UNK	UNK	UNK	OFB - (Teichert; 9940 JH)
OFB-45	NA	UNK	UNK	UNK	UNK	OFB - (Teichert; 10004 JH)
OFB-46	NA	UNK	UNK	UNK	UNK	OFB - (private; 10180 JH)
OFB-47	NA	UNK	UNK	UNK	UNK	OFB - (private; 10221 JH)
OFB-48	NA	UNK	UNK	UNK	UNK	OFB - (private; 10175 JH)
OFB-49	NA	UNK	UNK	UNK	UNK	OFB - (CalAm; Oaken Bucket)
OFB-51	WT/B/D	UNK	UNK	UNK	UNK	OFB - (Juvenile Hall No 1)
OFB-52	WT/B/D	UNK	UNK	UNK	UNK	OFB - (Juvenile Hall No 2)
OFB-53	NA	UNK	UNK	UNK	UNK	OFB - (private; 10204 JH)
OFB-54	B/D	UNK	UNK	UNK	UNK	OFB - (CalAm; South Port)
OFB-55	B/D/Dd	UNK	UNK	UNK	UNK	OFB - (CalAm; Westporter)
OFB-56	B/D/Dd	UNK	UNK	UNK	UNK	OFB - (CalAm; Tallyho #2)
OFB-57	NA	UNK	UNK	UNK	UNK	OFB - (private; 9815 JH)
OFB-67	NA	UNK	UNK	UNK	UNK	OFB (private; 9721 Farm Lane)
OFB-68	NA	UNK	UNK	UNK	UNK	OFB (private; 4575 Bradshaw Road)
OFB-69	NA	UNK	UNK	UNK	UNK	OFB
OFB-70	NA	UNK	UNK	UNK	UNK	OFB
OFB-71	NA	UNK	UNK	UNK	UNK	OFB
OFB-72	NA	UNK	UNK	UNK	UNK	OFB
OFB-73	NA	UNK	UNK	UNK	UNK	OFB
OFB-74	NA	UNK	UNK	UNK	UNK	OFB
OFB-75	NA	UNK	UNK	UNK	UNK	OFB

TABLE 2-1 (Continued)

Well ID	Hydro-Stratigraphic Unit	Top of Protective Casing Elevation (ft msl)	Ground Surface Elevation (ft msl)	Top of Screen (ft msl)	Base of Screen (ft msl)	Study Area or OFB Supply Well (Owner; Address)
OFB-76	NA	UNK	UNK	UNK	UNK	OFB
OFB-77	NA	UNK	UNK	UNK	UNK	OFB
OFB-78	NA	UNK	UNK	UNK	UNK	OFB
OFB-79	NA	UNK	UNK	UNK	UNK	OFB
OFB-80	NA	UNK	UNK	UNK	UNK	OFB
OFB-81	NA	UNK	UNK	UNK	UNK	OFB
OFB-82	NA	UNK	UNK	UNK	UNK	OFB
OFB-83	NA	UNK	UNK	UNK	UNK	OFB
OFB-84	NA	UNK	UNK	UNK	UNK	OFB
OFB-85	NA	UNK	UNK	UNK	UNK	OFB
OFB-86	NA	UNK	UNK	UNK	UNK	OFB

Notes:

* = well was resurveyed in 2-13
AC&W = Aircraft Control and Warning Plume
CalAm = California-American Water Company
ft msl = feet mean sea level
ft bgs = feet below ground surface
GOLF = Golf Course Area
HL = Happy Lane
JH = Jackson Highway
LF = Landfill
LMT = Laguna Mehrten Transition
MBP = Main Base/SAC Area Plume
NA = Not Available
NEP = Northeast Plume
NS = Not Surveyed
OPR = Old Placerville Road
UNK = Unknown
WTZPERCH = Perched Water Table

TABLE 2-2

Sitewide Groundwater Level Calculations
Second and Fourth Quarter 2013
Former Mather Air Force Base
Sacramento County, California

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl)				
					2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
7-BV-01	SITE 7	PERCHED	73.48	3.45	30.9	27.45	28.66	25.21	
7-BV-02	SITE 7	PERCHED	72.68	-6.78	27.04	33.82	25.46	32.24	
7-BV-04	SITE 7	PERCHED	76.72	5.94	30.06	24.12	28.99	23.05	
7-BV-06	SITE 7	PERCHED	71.84	8.88	29.91	21.03	29.17	20.29	
7-BV-07	SITE 7	PERCHED	71.72	17.91	30.72	12.81	28.89	10.98	
7-BV-08	SITE 7	PERCHED	78.45	6.88	30.46	23.58	29.14	22.26	
7-BV-13	SITE 7	PERCHED	75.51	19.9	31.16	11.26	29.31	9.41	
7-EW-1	SITE 7	B	43.51	-115.69	-43.54	72.15	-66.3	49.39	
7-EW-2	SITE 7	B	54.13	-63.47	-43.97	19.5	-48.71	14.76	
7-IW-01	SITE 7	B	76.4	-89.35	46.9	136.25	-26.47	62.88	
7-IW-02	SITE 7	B	78.53	-86.99	-21.02	65.97	-25.07	61.92	
7-IW-03	SITE 7	B	79.51	-80.99	-19.9	61.09	-24.66	56.33	
7-IW-04	SITE 7	B	79.95	-52.75	-21.1	31.65	-20.69	32.06	
7-PZ-23	SITE 7	B	80.11	-51.3	-22.34	28.96	-24.88	26.42	
7-PZ-24	SITE 7	B	78.64	-54.2	-22.08	32.12	-24.5	29.7	
7-PZ-25	SITE 7	B	80.38	-51.25	-21.87	29.38	-24.68	26.57	
7-PZ-26	SITE 7	B	78.24	-46.7	-21.79	24.91	-24.46	22.24	
7-PZ-37	SITE 7	WT/C	75.8	-22.2	-21.81	0.39	**-22.21**	-0.01	
7-PZ-37P	SITE 7	PERCHED	75.63	11	32.13	21.13	29.52	18.52	
7-PZ-38P	SITE 7	PERCHED	56.99	13.89	32.68	18.79	26.49	12.6	
7-PZ-39	SITE 7	C	60.92	-89.98	-24.29	65.69	-26.96	63.02	
7-PZ-40	SITE 7	C	56.11	-31.84	-23.84	8	-26.38	5.46	
7-PZ-41	SITE 7	C	56.11	-56.84	-23.91	32.93	-26.55	30.29	
ACW AT-1	AC&W	C	130.91	-36.73	-21.86	14.87	-26.64	10.09	
ACW AT-2	AC&W	C	124.28	-47.6	-27.46	20.14	-28.14	19.46	
ACW AT-3	AC&W	C	122.46	-49.46	-11.94	37.52	-14.94	34.52	
ACW AT-4	AC&W	D	126.06	-113.94	-13.93	100.01	-16.89	97.05	
ACW EW-1	AC&W	C	125.17	-51.98	-22.33	29.65	-33.55	18.43	
ACW EW-2	AC&W	C	122.47	-58.69	-20.73	37.96	-17.18	41.51	
ACW EW-3	AC&W	C	125.41	-60.74	-24.21	36.53	-31.36	29.38	
ACW EW-4	AC&W	C	115.39	-75.34	-16.76	58.58			decommissioned in 2013
ACW EW-5	AC&W	C	114.52	-76.89	-15.48	61.41			decommissioned in 2013
ACW EW-6	AC&W	C	128.11	-63.05	-18.84	44.21	-19.55	43.5	
ACW EW-6R	AC&W	C	127.97	-58.17	-31.13	27.04	-20.33	37.84	
ACW PZ-01	AC&W	C	109.03	-71.09	-16.21	54.88	-19.9	51.19	
ACW PZ-02	AC&W	C	110.25	-69.9	-16.24	53.66	-19.78	50.12	
ACW PZ-03	AC&W	C	116.68	-63.42	-17.14	46.28	-20.51	42.91	
ACW PZ-04	AC&W	C	108.35	-71.73	-16.41	55.32	-19.99	51.74	
ACW PZ-05	AC&W	C	115.2	-62.53	-17.08	45.45	-20.63	41.9	
ACW PZ-06	AC&W	WT/C	121.62	-16.5					dry
ACW PZ-06C	AC&W	C	121.62	-61.5	-15.19	46.31	-18.4	43.1	
ACW PZ-07	AC&W	WT/C	127.91	-14.5					dry
ACW PZ-07C	AC&W	C	127.91	-54.5	-14.64	39.86	-17.13	37.37	
ACW PZ-08	AC&W	WT/C	123.75	-12					dry
ACW PZ-08C	AC&W	C	123.75	-49	-12.72	36.28	-15.41	33.59	
ACW PZ-09	AC&W	WT/C	126.77	-11.2	-10.96	0.24			dry in 4Q
ACW PZ-09C	AC&W	C	126.77	-46.2	-12.11	34.09	-16.14	30.06	
ACW PZ-10	AC&W	WT/C	129.19	-8.3					dry
ACW PZ-10C	AC&W	C	129.19	-43.3	-11.01	32.29	-13.78	29.52	
FFS MW15-6	MBP	D	79.6	-100.4	-18.63	81.77	-22.09	78.31	
MAFB-005	LF04	WT/B	137.64	9.04	22.3	13.26	21.64	12.6	
MAFB-006	MBP	WT/B	98.34	-3.7	7.69	11.39			decommissioned in 2013
MAFB-012	MBP	WT/B	96.52	-1.63	5.65	7.28	3.31	4.94	
MAFB-013	MBP	WT/B	92.21	-5.79	1.9	7.69	-0.27	5.52	
MAFB-033	MBP	WT/Bu	80.88	-13.12	-11.77	1.35	**-14.64**	-1.52	
MAFB-039	SITE 7	PERCHED	75	-11.29	32.12	43.41	31.35	42.64	
MAFB-041	SITE 7	B	73.64	-47.72	-21.54	26.18	-23.93	23.79	
MAFB-042	SITE 7	WT/B	74.98	-36.26	-21.49	14.77	-23.9	12.36	
MAFB-043	SITE 7	C	75.15	-54.76	-21.73	33.03	-24.43	30.33	
MAFB-044	SITE 7	PERCHED	76.3	-6.3	33.19	39.49	32.49	38.79	
MAFB-046	SITE 7	PERCHED	68.6	-22.95	10.09	33.04	11.29	34.24	
MAFB-047	MBP	WT/Bu	77.24	-19.07	-14.31	4.76	-16.93	2.14	
MAFB-048	MBP	WT/A	75.63	-15.74	-11.9	3.84	-14.7	1.04	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl) 2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MAFB-053	AC&W	C	131.33	-46.85	-12.85	34	-16.02	30.83	
MAFB-054	AC&W	WT/C	118.68	-12.72	-11.77	0.95			dry in 4Q
MAFB-056	SITE 7	D	74.17	-124.67	-23.48	101.19	-26.23	98.44	
MAFB-058	SITE 7	D	75.52	-117.14	-23.16	93.98	-25.93	91.21	
MAFB-059	SITE 7	B	69.62	-112.47	-23.65	88.82	-26.13	86.34	
MAFB-060	MBP	D	77.48	-118.68	-23.91	94.77	-26.78	91.9	
MAFB-061	MBP	D	78.43	-126.63	-23.9	102.73	-27	99.63	
MAFB-062	MBP	D	80.06	-122.08	-24.03	98.05	-27.21	94.87	
MAFB-063	MBP	D	76.09	-120.4	-24	96.4	-27.99	92.41	
MAFB-064	LF04	D	134.9	-61.24	2.11	63.35	-0.84	60.4	
MAFB-065	LF04	D	136.74	-80.2	1.49	81.69	-1.44	78.76	
MAFB-066	MBP	Dd	93.51	-174.52	-19.5	155.02*			decommissioned in 2013
MAFB-067	AC&W	D	129.41	-82.12	-11.88	70.24	-14.58	67.54	
MAFB-068	AC&W	D	131.44	-97.73	-12.1	85.63	-14.79	82.94	
MAFB-069	AC&W	D	133.87	-93.13	-11.4	81.73	-13.99	79.14	
MAFB-070	AC&W	D	123.6	-80.75	-13.15	67.6	-15.85	64.9	
MAFB-071	AC&W	D	131.48	-90.13	-13.17	76.96	-16.22	73.91	
MAFB-072	AC&W	D	117.07	-99	-12.78	86.22	-15.98	83.02	
MAFB-073	MBP	B	92.76	-40.38	4.28	44.66			decommissioned in 2013
MAFB-075	LF04	WT/B	135.83	23.78	25.64	1.86	24.96	1.18	
MAFB-078	AC&W	D	126.64	-86.11	-14.03	72.08	-17	69.11	
MAFB-082	AC&W	WT/C	122.02	-0.33	0.97	1.3			decommissioned in 2013
MAFB-090	MBP	WT/Bu	80.01	-11.3	-11.24	0.06	**-12.32**	-1.02	
MAFB-092	MBP	WT/A	84.94	-9.49					dry
MAFB-093	MBP	WT/B	93.38	-8.62	-0.01	8.61	-2.24	6.38	
MAFB-094	MBP	WT/B	90.41	-15.99	-2.74	13.25	-5.3	10.69	
MAFB-096	MBP	WT/B	92.72	-9.07	-0.73	8.34	-3.04	6.03	
MAFB-097	MBP	WT/B	90.03	-14	-3.48	10.52	-6.23	7.77	
MAFB-099	MBP	WT/A	84.72	-7.29	**-8.03**	-0.74			decommissioned in 2013
MAFB-101	MBP	B	83.61	-50.32	-12.19	38.13	-15.07	35.25	
MAFB-102	MBP	D	83.03	-122.45	-21.68	100.77	-24.88	97.57	
MAFB-103	MBP	D	74.82	-112.64	-23.42	89.22	-26.2	86.44	
MAFB-104	MBP	D	73.72	-137.33	-25.23	112.1	-28.05	109.28	
MAFB-105	MBP	WT/A	84.47	-7.53					dry
MAFB-107	MBP	WT/B	96.88	-9.52	7.92	17.44	5.27	14.79	
MAFB-108	MBP	WT/B	94.61	-1.4	**-1.9**	-0.5			decommissioned in 2013
MAFB-109	LF03	WT/C	120.59	17.48	31.09	13.61	29.24	11.76	
MAFB-110	LF03	WT/B	113.55	11.9					dry
MAFB-111	LF03	WT/B	127.65	7.53	10.05	2.52	8.86	1.33	
MAFB-112	LF03	WT/C	121.09	0.26	**-4.08**	-4.34	**-4.08**	-4.34	
MAFB-115	MBP	WT/B	91.47	-10.46	-2.34	8.12	-4.57	5.89	
MAFB-116	MBP	WT/B	89.94	-11.06	-5.96	5.1	-9.08	1.98	
MAFB-121	MBP	WT/A	77.37	-14.83	-13.99	0.84	**-15.01**	-0.18	
MAFB-122	MBP	WT/A	73.44	-12.58	-10.58	2	-12.56	0.02	
MAFB-123	MBP	WT/A	77.19	-15.53	-13.86	1.67	**-15.78**	-0.25	
MAFB-124	MBP	WT/A	69.69	-15.4	-12.94	2.46	-14.87	0.53	
MAFB-125	MBP	WT/B	92.46	-5.54	-1.91	3.63	-4.11	1.43	
MAFB-126	MBP	WT/B	94.22	-6.78	1.34	8.12	-0.7	6.08	
MAFB-127	LF04	WT/C	117.6	-15.4	-8.86	6.54	-12.7	2.7	
MAFB-128	LF04	WT/B	122.28	-5.27	-4.37	0.9			decommissioned in 2013
MAFB-129	LF03	WT/C	116.93	-11.07	-8.84	2.23	**-12.39**	-1.32	
MAFB-130	LF03	WT/B	114.99	14.98	**14.39**	-0.59	**14.2**	-0.78	
MAFB-131	LF03	WT/B	125.61	-9.97	14.92	24.89	14.85	24.82	
MAFB-132	LF04	WT/B	131.21	-7.22	3.64	10.86	1.34	8.56	
MAFB-133	LF03	WT/B	128.21	-10.35	0.51	10.86	-1.67	8.68	
MAFB-136	LF04	WT/B	133.15	9.68	11.6	1.92	10.07	0.39	
MAFB-139	LF04	WT/C	132.69	-1.96					dry
MAFB-140	LF04	WT/C	140.32	6.86	7.28	0.42	7.29	0.43	
MAFB-141	LF04	WT/B	139.14	6.7	**4.46**	-2.24	**4.47**	-2.23	
MAFB-148	SITE 7	B	77.04	-44.59	-20.6	23.99	-22.89	21.7	
MAFB-149	SITE 7	WT/B	74.53	-38.07	-20.86	17.21	-23	15.07	
MAFB-150	MBP	WT/B	94.02	-6.5	4.71	11.21			decommissioned in 2013
MAFB-151	MBP	WT/B	98.71	-3.29	4.64	7.93	2.67	5.96	
MAFB-152	MBP	WT/B	89.8	-11.24	-2.8	8.44	-5.06	6.18	
MAFB-154	MBP	WT/B	94.53	-14.47	2.65	17.12	0.52	14.99	
MAFB-155	MBP	WT/B	92.2	-15.8	0.05	15.85	-2.21	13.59	
MAFB-156	MBP	WT/A	74.92	-17.05	-10.67	6.38	-13.53	3.52	
MAFB-157	MBP	WT/A	74.15	-20.56	-8.98	11.58	-10.76	9.8	
MAFB-158	MBP	WT/Bu	79.44	-14.94	-9.63	5.31	-12.5	2.44	
MAFB-159	MBP	WT/A	79.87	-14.27	-12.77	1.5	**-14.87**	-0.6	
MAFB-160	MBP	WT/A	84.89	-7.65	**-8.18**	-0.53	**-8.21**	-0.56	dry

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl)				
					2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MAFB-162	MBP	WT/A	87.57	-2.48	-1.91	0.57			decommissioned in 2013
MAFB-163	MBP	WT/A	91.66	-3.34	-2	1.34			decommissioned in 2013
MAFB-164	MBP	B	76.31	-71.87	-11.88	59.99	-14.53	57.34	
MAFB-165	MBP	B	80.95	-65.16	-12.25	52.91	-14.9	50.26	
MAFB-166	MBP	B	79.94	-56.82	-12.98	43.84	-15.64	41.18	
MAFB-167	MBP	B	78.42	-56.01	-14.5	41.51	-17.08	38.93	
MAFB-168	MBP	WT/Bu	75.15	-42.22	-15.65	26.57	-18.26	23.96	
MAFB-169	MBP	B	80.38	-61.68	-12.63	49.05	-15.38	46.3	
MAFB-170	MBP	B	79.76	-61.29	-12.85	48.44	-15.37	45.92	
MAFB-171	MBP	B	79.2	-55.15	-13.97	41.18	-16.65	38.5	
MAFB-172	MBP	WT/Bu	75.35	-34.89	-14.91	19.98	-17.5	17.39	
MAFB-173	MBP	B	77.35	-66.26	-15.11	51.15	-17.37	48.89	
MAFB-174	MBP	Bu	79.59	-39.07	-12.82	26.25	-14.96	24.11	
MAFB-175	MBP	B	73.58	-78.46	-12.17	66.29	-14.59	63.87	
MAFB-176	MBP	Bu	76.9	-43.7	-13.86	29.84	-15.77	27.93	
MAFB-177	MBP	B	69.7	-82.3	-15.61	66.69	-17.54	64.76	
MAFB-178	MBP	D	95.46	-109.6	-20.74	88.86	-24.61	84.99	
MAFB-179	MBP	D	97.34	-80.31	-13.52	66.79	-16.77	63.54	
MAFB-180	MBP	D	74.82	-112.13	-23.96	88.17	-27.47	84.66	
MAFB-181	MBP	D	74.13	-133.58	-25.19	108.39	-27.97	105.61	
MAFB-184	SITE 7	PERCHED	74.71	6.96	31.98	25.02	31.62	24.66	
MAFB-185	SITE 7	PERCHED	75.62	5.95	32.88	26.93	32.81	26.86	
MAFB-187	MBP	WT/A	86.74	-6.86	**-8.87**	-2.01			decommissioned in 2013
MAFB-188	MBP	WT/A	85.24	-8.36	**-9.24**	-0.88			dry
MAFB-189	SITE 7	PERCHED	75.57	6.09	32.31	26.22	31.53	25.44	
MAFB-191	AC&W	D	125.24	-124.86	-17.93	106.93	-21.88	102.98	
MAFB-193	AC&W	C	125.99	-44.42	-13.42	31	-16.79	27.63	
MAFB-194	AC&W	C	126.71	-55.96	-15.58	40.38	-18.55	37.41	
MAFB-195	AC&W	C	120.4	-58.58	-16.82	41.76	-19.71	38.87	
MAFB-196	AC&W	C	122.37	-50.42	-12.3	38.12	-15.04	35.38	
MAFB-197	AC&W	WT/C	106.6	-10.88	**-11.34**	-0.46			decommissioned in 2013
MAFB-198	AC&W	C	106.27	-71.52	-17.48	54.04			decommissioned in 2013
MAFB-199	MBP	WT/Bu	79.11	-18.9	-10.74	8.16	-13.43	5.47	
MAFB-200	MBP	WT/A	80.28	-17.8	-13.65	4.15	-16.17	1.63	
MAFB-201	MBP	WT/Bu	78.75	-16	-12.06	3.94	-14.76	1.24	
MAFB-202	MBP	WT/A	82.7	-15.5	-13.58	1.92			dry in 4Q
MAFB-203	MBP	WT/A	78.76	-16	-14.86	1.14	**-17.33**	-1.33	
MAFB-204	MBP	WT/A	83.31	-14.7	-12.51	2.19	**-14.99**	-0.29	
MAFB-205	MBP	WT/A	80.54	-17.6	-12.28	5.32	-14.77	2.83	
MAFB-206	MBP	WT/A	80.62	-13.4	-12.44	0.96			dry in 4Q
MAFB-207	MBP	WT/A	79.62	-15.37	-12.33	3.04	-15.09	0.28	
MAFB-208	MBP	WT/A	83.34	-14.6	-14.23	0.37	**-16.61**	-2.01	
MAFB-209	MBP	WT/A	82.53	-13.3	-12.92	0.38			dry in 4Q
MAFB-210	MBP	WT/A	83.33	-14.8	-12.78	2.02			dry in 4Q
MAFB-211	MBP	WT/A	78.93	-16.3	-11.82	4.48	-14.47	1.83	
MAFB-212	MBP	WT/A	86.36	-11.6	-11.02	0.58			dry in 4Q
MAFB-214	MBP	WT/A	85.53	-9.47	-7.8	1.67			dry in 4Q
MAFB-215	MBP	B	80.3	-72.8	-13.9	58.9	-16.41	56.39	
MAFB-216	MBP	B	78.98	-51.1	-13.73	37.37	-16.05	35.05	
MAFB-217	MBP	B	82.17	-55.8	-13.61	42.19	-16.1	39.7	
MAFB-218	MBP	B	79.05	-62.9	-13.59	49.31	-16.17	46.73	
MAFB-219	MBP	B	83.21	-59.8	-12.56	47.24	-15.03	44.77	
MAFB-220	MBP	B	80.67	-62.6	-12.28	50.32	-14.74	47.86	
MAFB-221	MBP	Bu	77.01	-33.9	-11.94	21.96	-14.74	19.16	
MAFB-222	MBP	B	78.84	-57.1	-12.19	44.91	-14.75	42.35	
MAFB-223	MBP	B	80.49	-57.4	-12.46	44.94	-14.95	42.45	
MAFB-224	MBP	B	79.38	-62.3	-13.24	49.06	-16.07	46.23	
MAFB-225	MBP	B	82.53	-51.4	-13.08	38.32	-15.67	35.73	
MAFB-226	MBP	B	82.85	-56.2	-13.12	43.08	-15.69	40.51	
MAFB-227	MBP	B	81.72	-56.2	-11.78	44.42	-14.86	41.34	
MAFB-228	MBP	B	86.45	-51.7	-10.99	40.71	-13.78	37.92	
MAFB-229	MBP	B	84.21	-45.5	-10.91	34.59	-14.6	30.9	
MAFB-230	MBP	B	85.1	-40.9	-8.81	32.09	-11.14	29.76	
MAFB-231	MBP	B	85.71	-39	-8.53	30.47	-11.54	27.46	
MAFB-232	MBP	WT/B	90.15	-19.6	-5.05	14.55	-7.77	11.83	
MAFB-233	MBP	WT/B	93.61	-18.5	1.4	19.9	-0.57	17.93	
MAFB-234	MBP	B	89.12	-33.9	-8.18	25.72			decommissioned in 2013
MAFB-235	MBP	D	81.9	-91.1	-21.03	70.07	-24.02	67.08	
MAFB-239	MBP	D	79.28	-118.8	-24.37	94.43	-27.28	91.52	
MAFB-240	MBP	D	79.4	-123.5	-24.51	98.99	-27.91	95.59	
MAFB-241	MBP	D	80.39	-137.5	-23.76	113.74	-27.06	110.44	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl)				
					2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MAFB-242	MBP	D	78.98	-106	-23.35	82.65	-26.37	79.63	
MAFB-243	MBP	D	77.04	-145.6	-24.98	120.62	-28.32	117.28	
MAFB-244	MBP	WT/A	85.76	-10.2	-8.81	1.39	**-11.61**	-1.41	
MAFB-246	MBP	WT/Bu	84.51	-15.5	-10.66	4.84	-13.91	1.59	
MAFB-247	MBP	WT/B	79.18	-52.8	-14.46	38.34	-16.93	35.87	
MAFB-248	MBP	WT/B	80.69	-44.4	-12.2	32.2	-14.72	29.68	
MAFB-249	MBP	B	86.15	-38.8	-9.59	29.21	-12.11	26.69	
MAFB-250	MBP	D	85.77	-116.4	-18.19	98.21	-21.11	95.29	
MAFB-251	MBP	WT/A	75.66	-13.4	-2.09	11.31	-5.75	7.65	
MAFB-258	MBP	WT/Bu	71.51	-33.5	-16.43	17.07	-19.26	14.24	
MAFB-259	MBP	Bu	71.69	-37	-15.7	21.3	-18.63	18.37	
MAFB-260	MBP	Bu	66.37	-33.13	-16.62	16.51	-19.04	14.09	
MAFB-261	MBP	Bu	68.91	-51	-14.35	36.65	-16.17	34.83	
MAFB-263	MBP	Bu	69.3	-44.6	-13.31	31.29	-14.93	29.67	
MAFB-264	MBP	WT/Bu	81.34	-26.1	-11.69	14.41	-14.29	11.81	
MAFB-265	MBP	B	84.7	-53.8	-11.14	42.66	-13.93	39.87	
MAFB-266	MBP	B	75.44	-77.6	-15.78	61.82	-18.62	58.98	
MAFB-267	MBP	B	72.02	-93.7	-22.11	71.59	-24.41	69.29	
MAFB-268	MBP	B	69.28	-83.7	-17.58	66.12	-19.03	64.67	
MAFB-269	MBP	B	68.92	-96	-14.97	81.03	-17	79	
MAFB-270	MBP	B	65.41	-110.5	-18.43	92.07	-19.95	90.55	
MAFB-271	MBP	B	65.27	-93.8	-8.86	84.94	-12.34	81.46	
MAFB-272	MBP	B	74.38	-82.12	-9.16	72.96	-12.2	69.92	
MAFB-273	MBP	B	75.71	-60.3	-9.1	51.2	-12.16	48.14	
MAFB-274	MBP	B	84.88	-45.5	-10.03	35.47	-12.85	32.65	
MAFB-276	NEP	WT/B	86.72	-13.8	-6.68	7.12	-9.75	4.05	
MAFB-277	NEP	WT/B	88.1	-14.4	-7.05	7.35	-10.19	4.21	
MAFB-278	NEP	WT/B	94.04	2					dry
MAFB-280	MBP	B	91.91	-27.1	0.6	27.7	-1.76	25.34	
MAFB-281	MBP	B	90.31	-24.7	-1.31	23.39	-3.75	20.95	
MAFB-282	MBP	B	86.48	-28.5	-6.77	21.73	-9.39	19.11	
MAFB-283	SITE 7	B	77.96	-69	-20.54	48.46	-23.76	45.24	
MAFB-284	LF07	B	76.2	-56.7	-21.06	35.64	-23.59	33.11	
MAFB-285	SITE 7	C	70.8	-49.2	-22.34	26.86	-24.83	24.37	
MAFB-288	LF04	B	127.01	-28.22	-4.71	23.51	-8	20.22	
MAFB-289	LF03	WT/B	106.41	12.4	16.16	3.76	14.27	1.87	
MAFB-290	MBP	D	68.5	-137.8	-20.73	117.07	-23.71	114.09	
MAFB-291	MBP	D	74.39	-113.66	-17.63	96.03	-20.69	92.97	
MAFB-292	MBP	D	75.71	-114.3	-13.82	100.48	-16.91	97.39	
MAFB-293	MBP	D	65.35	-180.6	-23.8	156.8	-31.01	149.59	
MAFB-294	LF04	D	135.65	-76.53	-5.1	71.43	-7.91	68.62	
MAFB-296	MBP	D	68.19	-106.8	-21.12	85.68	-24.09	82.71	
MAFB-297	SITE 7	C	39.74	-83.9	-23.36	60.54	-24.56	59.34	
MAFB-300	SITE 7	C	41.18	-69					no access, well in tall reeds
MAFB-301	AC&W	C	125.27	-52.83	-16.74	36.09	-19.88	32.95	
MAFB-302	AC&W	C	108.07	-62.55	-16.69	45.86	-20.34	42.21	
MAFB-303	AC&W	C	116.28	-61.86	-15.32	46.54			decommissioned in 2013
MAFB-304	AC&W	C	120.75	-49.28	-17.6	31.68	-20.6	28.68	
MAFB-305	AC&W	C	108.85	-66.81	-14.99	51.82	-18.69	48.12	
MAFB-306	AC&W	C	124.64	-45.87	-16.06	29.81	-18.82	27.05	
MAFB-308	MBP	B	81.56	-43.44	-10.6	32.84	-13.26	30.18	
MAFB-309	MBP	B	69.56	-90.36	-7.19	83.17	-10.5	79.86	
MAFB-310	MBP	B	63.99	-106.08	-8.32	97.76	-11.76	94.32	
MAFB-311	MBP	B	59.08	-119.92	-16.82	103.1	-19.33	100.59	
MAFB-312	MBP	B	70.21	-139.79	-22.85	116.94	-24.19	115.6	
MAFB-313	MBP	B	74.08	-94.92	-15	79.92	-14.69	80.23	
MAFB-314	MBP	D	81.61	-108.37	-28.59	79.78	-31.61	76.76	
MAFB-315	MBP	D	69.54	-139.39	-20.4	118.99	-23.33	116.06	
MAFB-316	MBP	D	63.9	-176.14	-23.66	152.48	-26.49	149.65	
MAFB-317	MBP	D	59.12	-185.88	-25.54	160.34	-27.76	158.12	
MAFB-318	MBP	D	70.43	-184.57	-30.28	154.29	-31.18	153.39	
MAFB-319	MBP	D	65.51	-149.5	-23.63	125.87	-26.53	122.97	
MAFB-320	MBP	D	81.75	-138.25	-20.73	117.52	-24.45	113.8	
MAFB-321	MBP	Dd	65.41	-184.6	-29.71	154.89	-32.7	151.9	
MAFB-322	MBP	B	58.86	-129.14	-11.93	117.21	-15.03	114.11	
MAFB-323	MBP	B	69.32	-132.68	-22.18	110.5	-23.49	109.19	
MAFB-324	MBP	B	65.24	-97.26	-8.95	88.31	-12.2	85.06	
MAFB-325	MBP	B	68.59	-96.42	-9.25	87.17	-12.59	83.83	
MAFB-326	MBP	D	58.91	-185.09	-23.73	161.36	-26.4	158.69	
MAFB-327	MBP	D	69.48	-199.02	-34.43	164.59	-35.5	163.52	
MAFB-328	MBP	D	65.23	-134.72	-23.26	111.46	-26.1	108.62	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl) 2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MAFB-329	MBP	D	68.59	-136.36	-20.1	116.26	-23.11	113.25	
MAFB-330	MBP	B	70.8	-139.3	-22.12	117.18	-22.39	116.91	
MAFB-331	MBP	B	70.99	-139	-23.78	115.22	-24.89	114.11	
MAFB-332	MBP	D	70.68	-154.37	-26.22	128.15	-28.42	125.95	
MAFB-336	MBP	D	69.92	-210.13	-29.79	180.34	-30.07	180.06	
MAFB-337	MBP	Dd	58.8	-289.99	-26.28	263.71	-28.8	261.19	
MAFB-338	MBP	Dd	65	-255	-31.71	223.29	-35.04	219.96	
MAFB-339	MBP	WT/B	86.76	-8.2	-6.24	1.96	**-8.67**	-0.47	
MAFB-340	MBP	WT/B	89.14	-8.84	-5.19	3.65	-8.06	0.78	
MAFB-341	MBP	WT/B	86.92	-11.08	-3.53	7.55	-6.26	4.82	
MAFB-342	MBP	WT/B	88.44	-10.3	-3.97	6.33	-6.74	3.56	
MAFB-343	MBP	WT/B	87.88	-7.68	-5.54	2.14	-6.76	0.92	
MAFB-344	MBP	WT/B	89.85	-8.35	-2.07	6.28			decommissioned in 2013
MAFB-345	MBP	Dd	67.33	-325.28	-29.62	295.66	-31.25	294.03	
MAFB-346Bd	MBP	Bd	67.13	-132.27	-21.49	110.78	-22.71	109.56	
MAFB-346Bs	MBP	Bs	67.32	-80.67	-21.03	59.64	-22.35	58.32	
MAFB-346D	MBP	D	67.04	-187.27	-19.85	167.42	-31.33	155.94	
MAFB-347	MBP	LMT	68.73	-432.27	-27.8	404.47	-30.52	401.75	
MAFB-348B	MBP	B	68.55	-111.45	-13.38	98.07	-15.89	95.56	
MAFB-348Dd	MBP	Dd	68.55	-255.45	-27.57	227.88	-31.36	224.09	
MAFB-348Ds	MBP	Ds	68.55	-181.45	-27.21	154.24	-29.93	151.52	
MAFB-349	MBP	LMT	69.8	-375.22	-32.95	342.27	-34.48	340.74	
MAFB-350	MBP	LMT	64.94	-381.06	-31.47	349.59	-33.2	347.86	
MAFB-351Bd	MBP	Bd	64.61	-153.39	-20.9	132.49	-22.54	130.85	
MAFB-351Bs	MBP	Bs	64.61	-76.89	-15.67	61.22	-18.11	58.78	
MAFB-351D	MBP	D	64.61	-201.39	-31.32	170.07	-32.53	168.86	
MAFB-352D	MBP	Dd	67.67	-238.33	-27.35	210.98	-30.34	207.99	
MAFB-352LM	MBP	LMT	67.75	-392.38	-26.91	365.47	-29.52	362.86	
MAFB-353	MBP	LMT	68.33	-371.67	-29.09	342.58	-29.12	342.55	
MAFB-354B	MBP	B	68.22	-146.78	-21.99	124.79	-22.64	124.14	
MAFB-354D	MBP	D	68.22	-231.78	-28.81	202.97	-27.87	203.91	
MAFB-355B	MBP	B	54.6	-143.4	-19.85	123.55	-21.26	122.14	
MAFB-355D	MBP	D	54.6	-238.7	-25.25	213.45	-25.66	213.04	
MAFB-356B	MBP	B	67.58	-148.42	-23.74	124.68	-23.36	125.06	
MAFB-356Dd	MBP	Dd	67.58	-294.42	-30.86	263.56	-28.11	266.31	
MAFB-356Ds	MBP	Ds	67.58	-242.42	-30.89	211.53	-27.94	214.48	
MAFB-357D	MBP	D	89.43	-90.57	-15.45	75.12	-18.5	72.07	
MAFB-357Dd	MBP	Dd	89.44	-180.57	-23.2	157.37	-26.46	154.11	
MAFB-357Ds	MBP	Ds	89.44	-130.57	-22.5	108.07	-25.91	104.66	
MAFB-358B	MBP	B	88.59	-47.4	-5.99	41.41	-8.83	38.57	
MAFB-358D	MBP	D	88.61	-92.4	-16.64	75.76	-19.84	72.56	
MAFB-359	MBP	WT/Bu	77.84	-37.07	-15.13	21.94	-17.66	19.41	
MAFB-361	MBP	B	77.55	-57.65	-13.58	44.07	-16.44	41.21	
MAFB-362	MBP	B	80.44	-66.66	-13.5	53.16	-15.12	51.54	
MAFB-363	MBP	B	78.64	-69.16	-12.19	56.97	-14.77	54.39	
MAFB-364B	MBP	B	74.47	-85.53	-13.9	71.63	-16.54	68.99	
MAFB-364D	MBP	D	74.47	-128.53	-25.44	103.09	-28.41	100.12	
MAFB-365B	MBP	B	72.61	-92.04	-12.96	79.08	-15.29	76.75	
MAFB-365D	MBP	D	72.61	-137.04	-25.73	111.31	-28.55	108.49	
MAFB-366B	MBP	B	69.28	-90.72	-10.54	80.18	-12.27	78.45	
MAFB-366D	MBP	D	69.28	-120.72	-23.92	96.8	-26.85	93.87	
MAFB-367	MBP	D	70.42	-155.08	-25.83	129.25	-28.45	126.63	
MAFB-368B	MBP	B	69.9	-112.87	-17.32	95.55	-18.32	94.55	
MAFB-368D	MBP	D	70.03	-182.87	-26.73	156.14	-28.48	154.39	
MAFB-369	MBP	D	69.72	-148.4	-26.35	122.05	-28.99	119.41	
MAFB-371C	SITE 7	C	43.84	-66.74	-23.95	42.79	-25.88	40.86	
MAFB-371D	SITE 7	D	43.84	-114.6	-24.22	90.38	-26.32	88.28	
MAFB-372B	SITE 7	B	46.74	-64.69	-23.77	40.92	-26.3	38.39	
MAFB-372D	SITE 7	D	46.74	-96.69	-24.54	72.15	-26.81	69.88	
MAFB-373C	SITE 7	C	47.1	-62.15	18.4*	80.55	2.65*	64.8	anomalous measurements not used in analyses; inspect well for possible seal/casing failure
MAFB-373D	SITE 7	D	47.1	-103.36	-24.16	79.2	-26.56	76.8	
MAFB-374	MBP	D	90.78	-93.68	-17.58	76.1	-20.99	72.69	
MAFB-375	MBP	D	67.61	-112.39	-16.69	95.7	-21.18	91.21	
MAFB-376	MBP	D	56.17	-133.83	-22.52	111.31	-25.55	108.28	
MAFB-377	MBP	D	75.14	-124.86	-26.12	98.74	-28.36	96.5	
MAFB-378B	MBP	B	81.48	-42.52	-8.75	33.77	-11.55	30.97	
MAFB-378D	MBP	D	81.48	-98.52	-19.09	79.43	-19.73	78.79	
MAFB-379B	MBP	B	69.42	-90.58	-11.23	79.35	-14.49	76.09	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl) 2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MAFB-379D	MBP	D	69.42	-150.58	-25.82	124.76	-28.79	121.79	
MAFB-380B	MBP	B	66.2	-108.3	-10.43	97.87	-13.35	94.95	
MAFB-380D	MBP	D	66.2	-151.8	-24.8	127	-27.55	124.25	
MAFB-381B	MBP	B	72.72	-80	-16.25	63.75	-18.38	61.62	
MAFB-381D	MBP	D	72.72	-175	-27.76	147.24	-30.89	144.11	
MAFB-382B	MBP	B	69.13	-100.87	-21.18	79.69	-22.67	78.2	
MAFB-382D	MBP	D	69.13	-185.87	-28.19	157.68	-29.34	156.53	
MAFB-383B	MBP	B	75.63	-82.42	-17.35	65.07	-20	62.42	
MAFB-383D	MBP	D	75.63	-147.42	-24.57	122.85	-27.29	120.13	
MAFB-384B	MBP	WT/B	87.76	-18.24	-2.75	15.49	-5.45	12.79	
MAFB-384D	MBP	D	87.76	-87.24	-15.51	71.73	-18.66	68.58	
MAFB-385B	MBP	B	62.32	-119.68	-10.83	108.85	-13.88	105.8	
MAFB-385D	MBP	D	62.32	-169.68	-25.84	143.84	-28.5	141.18	
MAFB-386B	MBP	B	69.73	-110.6	-21.8	88.8	-23.74	86.86	
MAFB-386D	MBP	D	69.73	-190.6	-27.76	162.84	-29.53	161.07	
MAFB-387B	MBP	B	70.11	-139.75	-21.6	118.15	-22.2	117.55	
MAFB-387Dd	MBP	Dd	70.11	-269.75	-29.4	240.35	-27.99	241.76	
MAFB-387Ds	MBP	Ds	70.11	-224.75	-28.89	195.86	-27.38	197.37	
MAFB-388B	MBP	B	62.77	-142.23	-21.66	120.57	-22.45	119.78	
MAFB-388Dd	MBP	Dd	62.77	-277.23	-29.01	248.22	-29.08	248.15	
MAFB-388Ds	MBP	Ds	62.77	-232.23	-28.33	203.9	-28.07	204.16	
MAFB-389	NEP	WT/B	96.99	-21.16	-11.16	10	-14.82	6.34	
MAFB-390	NEP	WT/B	93.5	-24.38	-12.29	12.09	-16.13	8.25	
MAFB-391	SITE 7	C	74.68	-43.12	-21.72	21.4	-24	19.12	
MAFB-392	SITE 7	C	56.99	-36.11	-21.08	15.03	19.86	55.97	
MAFB-393	SITE 7	C	56.17	-32.23	-22.12	10.11			dry in 4Q
MAFB-394	SITE 7	C	55.17	-32.13	-24.39	7.74	-26.53	5.6	
MAFB-395	SITE 7	C	58.83	-37.57	-22.41	15.16	-25	12.57	
MAFB-396	SITE 7	B	60.92	-46.98	-22.49	24.49	-25.07	21.91	
MAFB-397	MBP	Dd	81.26	-164	-25.26	138.74	-26.4	137.6	
MAFB-398	LF03	WT/B	128.67	3.85	19.27	15.42	19.02	15.17	
MAFB-398C	LF03	C	128.67	-33.65	1.36	35.01	-1.44	32.21	
MAFB-399	LF03	C	125.3	-37.23	-1.88	35.35	-5.03	32.2	
MAFB-400	LF04	C	134.39	-23.21	-2.28	20.93	-5.13	18.08	
MAFB-401	AC&W	WT/C	128.44	-9.2	-9.02	0.18			decommissioned in 2013
MAFB-402	AC&W	WT/C	135.66	-12	-9.45	2.55	-11.26	0.74	
MAFB-403	AC&W	WT/C	132.21	-10.7	-9.54	1.16			dry in 4Q
MAFB-404	MBP	WT/B	89.35	-17.7	-4.86	12.84	-7.6	10.1	
MAFB-405	MBP	WT/B	88.28	-19.72	-5.67	14.05	-8.54	11.18	
MAFB-406	MBP	WT/B	81.42	-16.58	-9.77	6.81	-12.15	4.43	
MAFB-407	MBP	WT/Bu	85.57	-15	-8.05	6.95	-11.1	3.9	
MAFB-408	AC&W	WT/C	126.99	-10	-7.61	2.39			dry in 4Q
MAFB-409	NEP	WT/B	80.66	-19.5	-10.54	8.96	-12.6	6.9	
MAFB-410	MBP	WT/A	84.49	-18.5	-11.82	6.68	-14.58	3.92	
MAFB-411	MBP	WT/B	79.67	-23.38	-12.8	10.58	-15.45	7.93	
MAFB-412	MBP	WT/B	82.81	-24.09	-15.13	8.96	-18.42	5.67	
MAFB-413	LF07	WT/B	78.08	-28.97	-20.98	7.99	-23.51	5.46	
MAFB-414	MBP	WT/A	83.86	-18.14	-12.5	5.64	-15.65	2.49	
MAFB-415	MBP	WT/B	87.61	-25.54	-5.75	19.79	-8.56	16.98	
MAFB-416	MBP	WT/B	88.44	-18.65	-2.7	15.95			decommissioned in 2013
MAFB-417	MBP	WT/B	82.66	-28.94	-13.7	15.24	-16.33	12.61	
MAFB-418	MBP	WT/A	81.67	-26.91	-13.44	13.47	-16	10.91	
MAFB-419	MBP	WT/B	84.62	-21.48	-9.91	11.57	-12.66	8.82	
MAFB-420	MBP	WT/A	80.81	-29.31	-13.85	15.46	-16.32	12.99	
MAFB-421	MBP	WT/B	84.88	-23.17	-8.58	14.59	-11.39	11.78	
MAFB-422	MBP	WT/Bu	82	-27.15	-11.35	15.8	-13.88	13.27	
MAFB-423	MBP	WT/Bu	78.52	-36.4	-13.92	22.48	-16.5	19.9	
MAFB-423B	MBP	B	78.52	-89.4	-20.24	69.16	-23.18	66.22	
MAFB-424	SITE 7	WT/C	80.54	-28.93	-17.59	11.34	-18.99	9.94	
MAFB-425	MBP	WT/A	69.57	-32.76	-16.5	16.26	-19.63	13.13	
MAFB-426	MBP	B	64.86	-145.14	-22.3	122.84	-23.22	121.92	
MAFB-427	MBP	B	66.62	-143.43	-21.87	121.56	-22.57	120.86	
MAFB-428	MBP	WT/B	88.53	-24.93	-10.02	14.91	-12.97	11.96	
MAFB-429Bd	MBP	Bd	70.86	-107.14	-23.14	84	-25.61	81.53	
MAFB-429Bs	MBP	Bs	70.86	-77.14	-23.08	54.06	-25.54	51.6	
MAFB-429Bu	MBP	WT/Bu	70.86	-44.14	-23.05	21.09	-25.53	18.61	
MAFB-430	MBP	LMT	80.55	-193.46	-22.77	170.69	-26.52	166.94	
MAFB-431Bd	MBP	Bd	69.79	-113.2	-26.93	86.27	-29.36	83.84	
MAFB-431Dd	MBP	Dd	69.79	-168.2	-24.9	143.3	-27.39	140.81	
MAFB-431Ds	MBP	Ds	69.79	-144.2	-24.89	119.31	-27.36	116.84	
MAFB-432	AC&W	WT/C	126.47	-26.57	-15.5	11.07	-18.42	8.15	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl)				
					2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MAFB-433	AC&W	WT/C	112.84	-32.16	-17	15.16	-20.83	11.33	
MAFB-434Bd	MBP	Bd	69.79	-117.01	-24.11	92.9	-26.33	90.68	
MAFB-434Bs	MBP	Bs	69.79	-91.01	-23.62	67.39	-25.8	65.21	
MAFB-434Bu	MBP	WT/Bu	69.79	-53.01	-21.64	31.37	-23.68	29.33	
MAFB-435	MBP	Dd	74.75	-185.25	-24.95	160.3	-27.98	157.27	
MAFB-436	MBP	WT/A	83.1	-24.4	-9.85	14.55	-12.74	11.66	
MAFB-437Dd	MBP	Dd	66.78	-263.22	-28.03	235.19	-30.81	232.41	
MAFB-437Ds	MBP	Ds	66.78	-143.22	-23.62	119.6	-26.52	116.7	
MAFB-438	NEP	WT/B/C	137.59	0.74	5.55	4.81	3.43	2.69	
MAFB-439	MBP	WT/A	86.2	-21.8	-10.37	11.43	-13.13	8.67	
MAFB-440	SITE 7	WT/A	78.17	-30.1	-18.86	11.24	-21.24	8.86	
MAFB-440P	SITE 7	PERCHED	78.17	14.9	31.74	16.84	32.04	17.14	
MAFB-441	MBP	D	79.93	-139.1	-20.23	118.87	-23.24	115.86	
MAFB-442	MBP	D	83.33	-189.7	-23.11	166.59	-26.33	163.37	
MAFB-443	MBP	D	70.46	-205.6	-29.23	176.37	-28.93	176.67	
MAFB-444	SITE 7	B	55.65	-50.1	-22.96	27.14	-25.52	24.58	
MAFB-445	SITE 7	B	48.12	-58.9	-23.5	35.4	-26.04	32.86	
MAFB-446	SITE 7	C	50.17	-52.9	-22.54	30.36	-25.39	27.51	
MAFB-447	SITE 7	C	44.71	-58.2	-21.71	36.49	-24.72	33.48	
MAFB-448	SITE 7	B	49.34	-54.1	-23.7	30.4	-26.21	27.89	
MAFB-449Bd	MBP	Bd	52.72	-120.7	-23.45	97.25	-25.48	95.22	
MAFB-449Bs	MBP	Bs	52.72	-84.7	-23.01	61.69	-24.99	59.71	
MAFB-450	MBP	WT/Bu	75.43	-42	-15.55	26.45	-18.47	23.53	
MAFB-451	MBP	B	71.41	-73.7	-17.82	55.88	-20.44	53.26	
MAFB-452B	MBP	B	74.41	-78.7	-16.26	62.44	-18.79	59.91	
MAFB-452Bu	MBP	WT/Bu	74.41	-35.7	-15.9	19.8	-18.5	17.2	
MAFB-453	AC&W	WT/C	122.16	-22.9	-11.34	11.56	-14.45	8.45	
MAFB-453C	AC&W	C	122.16	-50.9	-12.05	38.85	-14.79	36.11	
MAFB-454	AC&W	WT/C	125.71	-24.5	-13.41	11.09	-16.35	8.15	
MAFB-454C	AC&W	C	125.71	-48.5	-13.43	35.07	-16.36	32.14	
MAFB-455	AC&W	WT/C	119.67	-30.3	-17.5	12.8	-20.44	9.86	
MAFB-456	AC&W	WT/C	124.32	-28.7	-16.54	12.16	-19.48	9.22	
MAFB-456C	AC&W	C	124.32	-53.7	-16.56	37.14	-19.64	34.06	
MAFB-457Bd	MBP	Bd	44.08	-131	-24.51	106.49	-26.49	104.51	
MAFB-457Bs	MBP	Bs	44.08	-95	-23.49	71.51	-25.32	69.68	
MAFB-458Bd	MBP	Bd	37.66	-132.3	-24.34	107.96	-26.32	105.98	
MAFB-458Bs	MBP	Bs	37.66	-95.3	-23.31	71.99	-25.21	70.09	
MAFB-459D	MBP	D	62.99	-212	-30.42	181.58	-31.1	180.9	
MAFB-459Dd	MBP	Dd	62.99	-267	-30	237	-30.88	236.12	
MAFB-460Bd	MBP	Bd	58.62	-131.5	-25.65	105.85	-27.28	104.22	
MAFB-460Bs	MBP	Bs	58.62	-108.5	-25.27	83.23	-26.75	81.75	
MAFB-461Bd	MBP	Bd	70.36	-147.7	-27.11	120.59	-28.42	119.28	
MAFB-461Bs	MBP	Bs	70.36	-121.7	-25.69	96.01	-26.86	94.84	
MAFB-462	MBP	D	60.34	-181.36	-24.87	156.49	-26.79	154.57	
MAFB-463D	MBP	D	72.57	-151.05	-24.23	126.82	-27	124.05	
MAFB-463Dd	MBP	Dd	72.62	-207.05	-24.9	182.15	-28.14	178.91	
MAFB-464	SITE 7	B	48.5	-67.75	-23.45	44.3	-24.28	43.47	
MAFB-465	LF04	WT/C	131.01	-6.85	-1.18	5.67	-4.23	2.62	
MBS 19EW01	MBP	B	84.37	-63.8	-9.91	53.89	-12.58	51.22	
MBS 19MW01	MBP	Bu	83.9	-43.8	-10.84	32.96	-13.54	30.26	
MBS 19MW02	MBP	Bu	82.89	-43.8	-10.94	32.86	-13.67	30.13	
MBS 19MW03	MBP	D	83.28	-109.6	-25.79	83.81	-28.75	80.85	
MBS 19MW04	MBP	D	83.06	-109.4	-23.55	85.85	-26.55	82.85	
MBS 39ABuB	MBP	WT/B	80.82	-38.42	-21.49	16.93	-34.3	4.12	
MBS 39EW02	MBP	B	88.68	-38.02	-6.23	31.79	-8.99	29.03	
MBS 39MW01	MBP	WT/A	85.5	-9	-8.93	0.07			decommissioned in 2013
MBS 39MW02	MBP	WT/A	85.51	-9.49	-8.94	0.55			dry in 4Q
MBS 39MW03	MBP	Bu	85.3	-32.7	-9.14	23.56	-12.01	20.69	
MBS 39MW04	MBP	Bu	85.4	-29.6	-8.98	20.62	-11.81	17.79	
MBS EW-10B	MBP	B	65.11	-110.38	-21.48	88.9	-23.59	86.79	
MBS EW-11B	MBP	B	63.49	-121.95	-31.58	90.37	-29.66	92.29	
MBS EW-12AB	MBP	WT/B	84.36	-41.43	-4.35	37.08	-7.05	34.38	
MBS EW-12B	MBP	B	66.95	-144.52	-32.13	112.39	-33.24	111.28	
MBS EW-13BuB	MBP	Bu	71.32	-114.03	-33.08	80.95	-34.95	79.08	
MBS EW-1A	MBP	WT	81.93	-5.27	**-7.58**	-2.31			dry
MBS EW1ABu	MBP	WT/Bu	81	-30.63	-16.41	14.22	-14.38	16.25	
MBS EW-1B	MBP	B	76.27	-63.3	-33.22	30.08	-33.28	30.02	
MBS EW-1Bu	MBP	WT/Bu	75.23	-29.56	-17.87	11.69	-20.84	8.72	
MBS EW-1D	MBP	D	83.87	-104.5	-53.58	50.92	-54.98	49.52	
MBS EW-2A	MBP	WT	74.53	-17.37					dry
MBS EW2ABu	MBP	WT/Bu	75.62	-34.96	-27.1	7.86	-31.11	3.85	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl) 2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MBS EW-2AR	MBP	WT/A	77.77	-39.09	-35.05	4.04	-37.02	2.07	
MBS EW-2B	MBP	B	78.58	-79.33	-58.84	20.49	-64.24	15.09	
MBS EW-2Bu	MBP	Bu	73.92	-33.87	-18.89	14.98	-25.64	8.23	
MBS EW-2D	MBP	D	75.43	-145.11	-37.38	107.73	-45.27	99.84	
MBS EW-3A	MBP	WT/A	75.54	-16.27					dry
MBS EW-3B	MBP	B	76.39	-84.07	-15.33	68.74	-18.89	65.18	
MBS EW-3Bu	MBP	Bu	74.38	-35.89	-14.67	21.22	-17.25	18.64	
MBS EW-3D	MBP	D	79.41	-125.21	-87.69	37.52	-87.79	37.42	
MBS EW-4A	MBP	WT/B	82.13	-29.89	-4.47	25.42	-7.07	22.82	
MBS EW4ABu	MBP	WT/Bu	74.21	-35.72	-25.79	9.93	-26.01	9.71	
MBS EW-4B	MBP	B	76.59	-74.84	-18.16	56.68	-21.36	53.48	
MBS EW-4Bu	MBP	WT/Bu	76.36	-50.94	-18	32.94	-19.24	31.7	
MBS EW-4D	MBP	D	82.06	-103.72	-98.19	5.53	-96.62	7.1	
MBS EW-5A	MBP	WT/B	83.45	-30.41	-4.12	26.29	-6.79	23.62	
MBS EW5ABu	MBP	WT/Bu	73.79	-36.96	-26	10.96	-29.72	7.24	
MBS EW-5B	MBP	B	65.88	-95.72	-26.63	69.09	-27.92	67.8	
MBS EW-5D	MBP	D	68.16	-142.17	-39.96	102.21	-42.69	99.48	
MBS EW6ABu	MBP	WT/A/Bu	81.75	-42.22	-11.83	30.39	-14.23	27.99	
MBS EW-6B	MBP	B	68.84	-115.91	-24.04	91.87	-14.93	100.98	
MBS EW-6D	MBP	D	63.51	-181.07	-42.97	138.1	-43.34	137.73	
MBS EW7ABu	MBP	WT/Bu	85.57	-34.17	-11.33	22.84	-17.26	16.91	
MBS EW-7B	MBP	B	77.29	-87.71	-16.63	71.08	-19.21	68.5	
MBS EW-8B	MBP	B	67.53	-63.3	-11.25	52.05	-13.89	49.41	
MBS EW-9B	MBP	B	76.53	-85.42	-39.47	45.95	-40.86	44.56	
MBS IW-501	MBP	LMT	87.06	-315.29	51.96	367.25	42.43	357.72	
MBS IW-502	MBP	LMT	86.57	-325.95	58.42	384.37	40.36	366.31	
MBS IW-503	MBP	LMT	85.54	-326.31	4.03	330.34	0.76	327.07	
MBS IW-504	MBP	LMT	81.21	-378.79	17.75	396.54	17.86	396.65	
MBS PZ-01	MBP	WT/A	79.76	-14.2	-12.76	1.44			dry in 4Q
MBS PZ-04	MBP	WT/A	80.14	-14.4	-13.2	1.2			dry in 4Q
MBS PZ-05	MBP	B	78.87	-58.5	-12.08	46.42	-14.83	43.67	
MBS PZ-06	MBP	B	79.85	-57.6	-12.34	45.26	-15.25	42.35	
MBS PZ-07	MBP	B	83.48	-61.1	-15.68	45.42	-18.56	42.54	
MBS PZ-08	MBP	B	84.41	-70.1	-12.18	57.92	-15.24	54.86	
MBS PZ-09	MBP	B	87.42	-31.54	-6.09	25.45	-9.03	22.51	
MBS PZ-10	MBP	B	87.7	-31.3	-6.01	25.29	-9.89	21.41	
MBS PZ-11	MBP	B	62.27	-65.7	-10.24	55.46	-13.17	52.53	
MBS PZ-12	MBP	LMT	84.48	-305.2	-21.49	283.71	-23.96	281.24	
MBS PZ-13	MBP	Dd	83.33	-176	-20.99	155.01	-23.6	152.4	
MBS PZ-14	MBP	LMT	83	-301.4	-20.15	281.25	-25.59	275.81	
MBS PZ-15	MBP	LMT	81.67	-300.8	-21.08	279.72	-23.73	277.07	
MBS PZ-16	MBP	B	82.16	-57.4	-10.76	46.64	-13.57	43.83	
MBS PZ-17	MBP	D	76.86	-133.5	-27.84	105.66	-27.14	106.36	
MBS PZ-18	MBP	D	77.02	-132.2	-19.99	112.21	-24.62	107.58	
MBS PZ-19	MBP	WT/A	82.06	-25.4	-13.21	12.19	-15.68	9.72	
MBS PZ-20	MBP	Bu	79.42	-31.6	-14.56	17.04	-17.23	14.37	
MBS PZ-21	MBP	WT/Bu	76.43	-25.3	-15.54	9.76	-18.08	7.22	
MBS PZ-22	MBP	WT/Bu	77.43	-26	-15.37	10.63	-17.94	8.06	
MBS PZ-37	MBP	B	73.32	-106.68	-12.8	93.88	-14.57	92.11	
MBS PZ-38	MBP	B	73.68	-93.32	-11.94	81.38	-14.62	78.7	
MBS PZ-39	MBP	B	70.86	-87.14	-11.4	75.74	-14.13	73.01	
MBS PZ-40	MBP	B	71.37	-65.63	-10.64	54.99	-13.55	52.08	
MBS PZ-41	MBP	B	74.05	-61.45	-11.47	49.98	-14.22	47.23	
MBS PZ-42D	MBP	B	71.37	-105.63	-11.46	94.17	-13.93	91.7	
MBS PZ-42S	MBP	B	71.37	-49.63	-11.33	38.3	-13.88	35.75	
MBS PZ-43	MBP	B	77.93	-65	-11.27	53.73	-14.17	50.83	
MBS PZ-44	MBP	B	77.63	-33.37	-13.52	19.85	-15.93	17.44	
MBS PZ-46	MBP	B	79.2	-40.3	-14.29	26.01	-19.66	20.64	
MBS PZ-47	MBP	B	79.82	-40.4	-13.17	27.23	-15.83	24.57	
MBS PZ-48D	MBP	B	82.15	-83.2	-19.56	63.64	-22.46	60.74	
MBS PZ-48S	MBP	B	82.15	-48.2	-11.78	36.42	-14.61	33.59	
MBS PZ-49D	MBP	LMT	80.29	-295.71	-20.26	275.45	-22.93	272.78	
MBS PZ-49S	MBP	B	80.29	-56.71	-10.29	46.42	-12.91	43.8	
MBS PZ-50D	MBP	LMT	83.48	-308.52	-21.83	286.69	-24.67	283.85	
MBS PZ-50S	MBP	Dd	83.48	-91.52	-11.49	80.03	-14.42	77.1	
MBS PZ-51	MBP	D	81.01	-103.64	-22.44	81.2	-25.41	78.23	
MBS PZ-52	MBP	D	85.95	-100.44	-12.05	88.39	-14.87	85.57	
MBS PZ-53	MBP	D	86.05	-116.98	-17.03	99.95	-19.7	97.28	

TABLE 2-2 (Continued)

Well ID	Study Area	Hydro-Statigraphic Zone	Reference Elevation (topc ft. msl)	Base of Screen (ft. msl)	Calculated Groundwater Elevation (ft. msl)				
					2nd Quarter 2013	2nd Quarter 2013 Water Height in Well	4th Quarter 2013	4th Quarter 2013 Water Height in Well	Comments
MBS PZ-54	MBP	D	80.37	-105.63	-18.44	87.19	-20.1	85.53	
MBS PZ-55B	MBP	B	76.39	-78.7	-15.35	63.35	-17.89	60.81	
MBS PZ-55Bu	MBP	Bu	76.39	-36.7	-15.46	21.24	-17.96	18.74	
MBS PZ-57B	MBP	B	90.86	-24.07					dry
MBS PZ-57D	MBP	D	90.35	-93.57	-15.46	78.11	-18.76	74.81	
MBS PZ-58	MBP	D	71.06	-109.23	-24.7	84.53	-27.71	81.52	
MBS PZ-59	MBP	WT/A	67.98	-23.94	-14.52	9.42	-16.45	7.49	
MBS PZ-59B	MBP	B	67.98	-97.02	-15.04	81.98	-17.16	79.86	

Note: **bold** values are below the lower screen elevation and are not used in analyses
* = value questionable based on historic and surrounding data

TABLE 2-3

Summary of Groundwater Well and Treatment System Maintenance Activities 2013
Former Mather Air Force Base
Sacramento County, California

Date	Maintenance Activity
Main Base/SAC Area	
1/14/2013	Replaced extraction well level transducers
1/15/2013 - 2/20/2013	Security inspections, Security upgrades, Gate Welding, Intrusion Hardening
1/28/2013	Replaced IW-501 vault sump pump
2/5/2013	Replace pull box on Goethe Road
2/5/2013	Replaced GWTP Auto-Dialer backup batteries
2/5/2013 - 2/20/2013	Renovated Pull-Boxes and Vault locations for Security Upgrades
2/8/2013	Replaced pressure gauges at EW-13Bu/B
2/18/2013	Replaced effluent pH probe
3/11/2013	Installed alarm security system and activated monitoring
3/19/2013	Replaced extraction well level transducers
3/27/2013	Lubricated GWTP pumps and blowers
4/4/2013	Replaced submersible extraction well pump at EW-4B
4/22/2013	Enhanced heat shading for control panel at EW-2D
5/8/2013	Restarted EW-7A/Bu
5/13/2013	Upgraded security lighting
5/15/2013	Replaced CPU cooling fan at GWTP SCADA PC
5/16/2013	Installed CCTV security camera system
5/17/2013 - 5/21/2013	PLC program troubleshooting at EW-4A/Bu
5/22/2013	Replaced level transducers at EW-2D, EW-5A/Bu and EW-5D
6/11/2013	Replaced defective cooling fans at above-ground extraction well panel locations
6/17/2013	Modified gate locking systems to improve security
6/24/2013	Lubricated GWTP pumps and blowers
6/24/2013	Replaced extraction well flow-meter at EW-11B
6/27/2013 - 7/26/2013	Well grouting and demo
7/9/2013	Had Sub out to check the fiber optic at EW-4Bu and EW-1Bu
7/24/2013	Sod restoration at well decommission sites
7/25/2013	Replaced faulty EW level transducers
7/25/2013	Lined CO_2 tank annual inspection
8/14/2013	Repaired piping at EW-1Bu
8/23/2013	CO_2 tank compressor repair
9/16/2013	CO_2 Tank Vented all gas due to leak. Sub repaired issue same day
9/20/2013	Lubricated GWTP pumps and motors
10/15/2013	Replaced GWTP UPS power supply
10/15/2013	Repaired piping at EW-1D
10/16/2013	Replaced flow-meter at EW-1Bu
11/4/2013	Replaced gaskets at EW-1Bu
11/4/2013	Replaced pressure gauges at various extraction wells
11/25/2013	Changed bearings out on B-301
12/4/2013	Replaced fiber optic cards at EW-2D communication line
12/10/2013	Lubricated GWTP pumps and motors
12/13/2013	Changed bearings out on B-301, inspected shaft and fan and cleaned fan blades of dirt and debris
12/28/2013	Installed SCADA backup system
Site 7	
1/31/2013-2/28/13	Security inspections, Security upgrades, Gate Welding, Intrusion Hardening
2/27/2013	Repaired defective influent flow meter
3/27/2013	Lubricated GWTP pumps and blower
5/1/2013	CO_2 pump stopped working trouble shot and ordered a replacement
5/22/2013	Replaced CO_2 injection pump
5/29/2013	Adjusted CO_2 injection control system
6/17/2013	Modified and enhanced security of gate locking systems
6/24/2013	Lubricated GWTP pumps and blower
6/25/2013	Repair blower motor
7/25/2013	System shutdown due to power issue that knocked out a modbus had MCC out to troubleshoot
7/25/2013	Lined CO_2 tank annual inspection
7/30/2013	Restart system after MCC fixed the issue
8/12/2013	Replaced faulty fiber optic MUX bridge
8/21/2013	Repair and replacement of CO_2 compressor
9/9/2013	Upgraded GWTP auto-dialer system to cellular network
9/16/2013 - 9/17/13	Preform Step test on EW-1 and EW-2
9/18/2013	Restart system after step test
9/19/2013	Recondition pH panel's pH probe
9/20/2013	Lubricated GWTP pumps and blower
9/26/2013	Replaced broken static mixer for CO_2 injector
11/14/2013	Replaced flow-meter at injection well IW-502
12/10/2013	Lubricated GWTP pumps and blower
12/14/2013 - 12/23/13	System down due to hard drive failing on the SCADA computer. Replaced and Reinstalled SCADA, Restart system on 12/23
12/16/2013	Replaced SCADA PC hard drive
12/18/2013	Completed security alarm installation
12/28/2013	Installed SCADA backup system

TABLE 2-3

Summary of Groundwater Well and Treatment System Maintenance Activities 2013
Former Mather Air Force Base
Sacramento County, California

AC&W	
1/2/2013	Discovered system had been broken into and damaged. Break in occurred on 12/29/2012.
1/3/2013	Golden State Fence repaired breaks in fence
1/3/2013	Connected a generator to totalizer to get final reading and to find out when the system shutdown.
1/3/2013	Police on site to investigate and collect finger prints
1/8/2013	Rewire Motor and Blower and trace signal wires
1/15/2013	Control panel wiring repairs
1/15/2013	Pullbox and Vault repairs, security enhancements
1/17/2013-2/8/2013	Security inspections, Security upgrades, Gate Welding, Intrusion Hardening
2/4/2013 - 2/8/13	Repair Wiring damage
2/11/2013 - 2/19/13	Install Security System at plant
2/14/2013	Utility power restored by SMUD
2/19/2013	Repair handles on control panels
2/28/2013 -3/5/13	Install lighting at treatment pad
3/6/2013	Security system online
3/12/2013	Replaced damaged ball valves on above ground extraction wells
3/14/2013	Replaced communication relay module at EW AT-1
3/15/2013	Restart system with temp lap top
3/27/2013	Lubricated GWTP pumps
4/16/2013	Installed new SCADA computer
6/3/2013	Replaced defective relays at GWTP auto-dialer
6/17/2013	Enhanced gate locking system to upgrade security
6/19/2013	Replaced extraction well pump at AT-2
6/21/2013	Upgraded GWTP auto-dialer system to cellular network
6/24/2013	Lubricated GWTP pumps
6/27/2013 - 7/26/13	Well grouting and demo
7/23/2013	Pressure grout and over drill well EW-4
7/24/2013	Pressure grout and over drill well EW-5
7/25/2013	Restored driveway at EW-4
7/25/2013 - 8/13/2013	Removed EW-5 and EW-4 vaults
7/26/2013	Restored sod at EW-5
8/12/2013	Pull and replace pump and motor at EW-1Bu
8/12/2013	Removed pull boxes at EW-4 and EW-5
8/12/2013	Restored sod at pull box locations
8/13/2013	Pull and replace pump and motor at EW-AT1
8/14/2013	Repaired above ground piping at EW-AT1
8/15/2013	Restored landscaping at EW-4
9/19/2013	Shutdown EW-6R
9/20/2013	Shutdown EW-2
9/20/2013	Lubricated GWTP pumps
9/23/13 - 9/24/13	Install sprinklers at the EW-4 vault location
9/26/2013	Install sod at the EW-4 vault location
10/11/2013	Shutdown system for the step test
10/14/13 - 1018/13	Preform Step test on AT-1, AT-2, EW-1 and EW-3
10/18/2013	Restart system
12/2/13 - 12/3/13	Redeveloped AT-1
12/3/13 - 12/4/13	Redeveloped AT-2
12/4/2013	Repaired leak at EW-2 (frozen burst pipe)
12/4/2013	Repaired electrical issue at EW-6R and restarted well
12/5/2013	Added 5 feet of drop pipe to AT-1
12/5/13 - 12/6/2013	Preform Step test on AT-1 and AT-2
12/10/2013	Lubricated GWTP pumps
12/28/2013	Installed SCADA backup system
Off-Base	
4/10/2013	Cleaned basket strainer at Moonbeam and replace pressure gauges
5/22/2013	Added magnetic signs to VGAC vessels

Notes:

CCTV = closed circuit television
CO_2 = carbon dioxide
CPU = central processing unit
EW = extraction well
GWTP = groundwater treatment plant
MCC = motor control center
MUX = multiplexer
PC = personal computer
PLC = programmable logic controller
SCADA = supervisory control and data acquisition
SMUD = Sacramento Municipal Utility District
UPS = uninterrupted power supply

TABLE 2-4

DECOMMISSIONED AND TEMPORARILY ABANDONED GROUNDWATER WELLS
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Abandonment Date	Study Area	References
DECOMMISSIONED WELLS				
7-PZ-27	B	Nov-99	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
7-PZ-28	B	Nov-99	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
7-PZ-29	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II (pg. 48)
7-PZ-30	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II (pg. 48)
7-PZ-31	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
7-PZ-32	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
7-PZ-33	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II (pg. 48)
7-PZ-34	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
7-PZ-35	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
7-PZ-36	B	Jun-00	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
ACW EW-4	C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
ACW EW-5	C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
AC&W IW-1	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-2	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-3	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-4	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-5	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-6	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-7	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
AC&W IW-8	C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
CU EXPLORER	N/A	Oct-98	N/A	(Sac Co EHD Form)
FFS-EW7-1	B	Jul-99	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
FFS-MW7-1	B	Jul-99	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
FFS-MW7-2	B	Jul-99	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
FFS-MW7-3	N/A	Jul-99	Site 7	AR # 1981 Draft Final Annual and Fourth Quarter Basewide Groundwater Monitoring Report, 00, Vol I of II Table 2-7
FH-4 (old)	N/A	1985	N/A	AF Correspondence, 6-19-85
JTC (Site 62)	N/A	Oct-93	N/A	AFI, App J
MAFB-001	WT (B/C)	Jun-98	AC&W	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-002	WT (C)	Jun-98	AC&W	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-003	WT (C)	Jun-98	AC&W	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-004	WT/B (C?)	Jun-98	N/A	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-006	WT/B	Jun-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-007	WT (B)	Oct-93	N/A	AFI, App J
MAFB-008	WT (A/B)	Oct-93	N/A	AFI, App J
MAFB-009	WT (Ap/B)	Oct-93	N/A	AFI, App J
MAFB-010	WT (A)	Oct-93	N/A	AFI, App J
MAFB-011	WT (A)	Oct-93	N/A	AFI, App J
MAFB-014	WT (B)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-015	WT (B)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-016	WT (B/C)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-017	WT (B/C)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-018	WT (B/C)	Jun-98	LF02	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-019	N/A	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-020	WT (B)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-021	WT (B)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-022	WT/B	May-09	LF05	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-023	WT (B)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-024	WT/B	Jun-98	LF03	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-025	WT (B)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-026	WT/B	Apr-09	LF03	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-027B	(Dry)	Jul-98	N/A	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)

TABLE 2-4 (Continued)

Well ID	Unit	Abandonment Date	Study Area	References
MAFB-027C	WT	Jul-98	N/A	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-028	WT	Jul-98	LF06	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-029	N/A	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-030	N/A	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-031	WT/B	Jul-98	MBP	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-032	N/A	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-034	WT	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-035	WT (A)	unknown	MBP	Group 2 RI - Volume 1 (AR#1624, p142 of 555).
MAFB-036	WT (A)	unknown	MBP	Additional Field Investigation Report, Volume 4 (AR#635, Appx J, p877 of 946).
MAFB-037	WT/Bu	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-038	N/A	Oct-93	N/A	AFI, App J
MAFB-040	WT (C)	As of 2Q 1991	N/A	Group 2 RI, Table 2-2
MAFB-045	WT (A/B)	Oct-93	Site 7	AFI, App J
MAFB-049	WT (B)	Jun-98	MBP	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-050	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-051	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-052	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-055	E	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-057	D	Jun-98	Site 7	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-066	Dd	Jun-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-073	B	Jun-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-074	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-076	WT/B	Jul-98	LF04	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.39)
MAFB-077	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-079	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-081	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-082	WT/C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-083	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-084	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-085	WT/B	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-086	WT/B	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-087	WT	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-088	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-089	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-091	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-095	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-098	N/A	Oct-93	N/A	AFI, App J
MAFB-099	WT	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-100	B	Jul-98	NEP	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.39)
MAFB-106	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-108	WT/B	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-113	WT/B	Apr-09	LF05	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-114	WT/B	Jul-98	NEP	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.39)
MAFB-117	B	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-119	B	Mar-03	Site 7	AR #2103 Final 2003 Groundwater Monitoring Program Evaluation Report (pg. 47)
MAFB-120	B	Mar-03	Site 7	AR #2103 Final 2003 Groundwater Monitoring Program Evaluation Report (pg. 47)
MAFB-128	WT/B	Jul-13	LF04	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-135	WT	9/12/1996	LF04	LF Cert. Rept, App F
MAFB-137	WT/C	May-09	LF04	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-138	WT	9/12/1996	LF05	LF Cert. Rept, App F
MAFB-142	WT/C	May-09	LF06	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-143	WT/C	May-09	LF06	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.

TABLE 2-4 (Continued)

Well ID	Unit	Abandonment Date	Study Area	References
MAFB-144	WT/C	May-09	LF06	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-146	B	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-150	WT/B	Jun-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-161	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-162	WT	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-163	WT	Jun-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-182	WT/B	Jun-98	Site 7	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-183	WT/C	Apr-09	SITE 7	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-186	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-187	WT	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-190	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-192	WT/C	May-09	AC&W	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-197	WT/C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-198	C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-213	WT	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-234	B	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-236	WT	Jun-98	N/A	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-237	WT	Jul-98	N/A	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-238	WT	Jul-98	N/A	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-245	WT/Bu	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-252	WT	Jul-07	MBP	Well Destruction Permit #37011
MAFB-253	WT	Apr-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-254	WT/B	May-09	Site 7	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-255	WT/B	Apr-09	Site 7	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-257	WT (PERCH)	Nov-99	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-275	WT/Bu	Apr-09	NEP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-279	WT/B	Jun-98	MBP	AR#46 Update Pages, Basewide Annual and Fourth Quarter Groundwater Monitoring Draft Final Report, Vol I, II of II, 98 (pg.38)
MAFB-287	B	Nov-99	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-295	D	May-09	Site 7	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-298	B	Jul-99	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-299	B	Nov-09	Site 7	Annual and Fourth Quarter 2009 Groundwater Monitoring Report
MAFB-303	C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-307	WT/B	May-09	LF02	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-333	WT/C	May-09	GOLF	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-334	WT/B	May-09	GOLF	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-335	WT/C	May-09	GOLF	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MAFB-344	WT/B	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-370	C	Sep-11	Site 7	Letter Report for Decommissioning of Groundwater Well MAFB-370, former Mather Air Force Base, AFRPA. September 2010.
MAFB-401	WT/C	Jul-13	AC&W	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MAFB-416	WT/B	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MBS 39MW01	WT	Jul-13	MBP	Technical Memo for Decommissioning Select Site-wide Groundwater Monitoring and Extraction wells, URS. August 2013
MBS PZ-2	WT	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
MBS PZ-3	WT	May-09	MBP	Final, Letter Report for Basewide Well and System Decommissioning Mather Air Force Base, California, MWH. July 2009.
TEMPORARILY ABANDONED WELLS				
MAFB-118	B	Jul-99	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-145	WT/B	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-147	B	NA	Site 7	Well was cut off by landowner and buried. Well is inaccessable.
MAFB-256	WT (PERCH)	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-262	D	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8
MAFB-286	B	Nov-98	Site 7	AR#1689 Draft Basewide Annual and Fourth Quarter Groundwater Monitoring Report, Vol II of II, 99 Table 2-8

Notes:

? = Precise information unknown, information based on best estimates.

TABLE 2-4 (Continued)

Well ID	Unit	Abandonment Date	Study Area	References

AC&W = Aircraft Control and Warning Plume
AF = Air Force
AFI = Additional Field Investigation
App = Appendix
AR = Administrative Record
ASC = Additional Site Characterization
GOLF = Golf Course Area
LF = Landfill
MBP = Main Base/SAC Area Plume
MW = Montgomery Watson
MWH = MWH Americas, Inc.
N/A = Not Applicable
RI = Remedial Investigation
Sac Co EHD = Sacramento County

TABLE 2-5

SCWA Production Well Totals

Well Name (SCWA)	Jan 2013 (MG)	Feb 2013 (MG)	Mar 2013 (MG)	Apr 2013 (MG)	May 2013 (MG)	Jun 2013 (MG)	Jul 2013 (MG)	Aug 2013 (MG)	Sep 2013 (MG)	Oct 2013 (MG)	Nov 2013 (MG)	Dec 2013 (MG)	Total (MG)
Branch Center System (combined production totals)													
Juvenile Hall 1 (OFB-51) Juvenile Hall 2 (OFB-52)	0.189	0.054	0.185	0.154	0.118	0.466	0.537	0.465	0.339	0.129	0.091	0.013	**2.738**
Mather System													
Mather (FH-1)	4.361	5.195	6.041	4.451	9.061	10.672	20.285	13.693	25.646	33.403	3.027	6.160	**141.995**
Branch (FH-3)	--	--	--	--	--	--	--	--	--	--	--	--	**--**
Kurtz (FH-4)	2.996	4.772	7.541	7.489	10.778	15.730	18.634	14.643	25.811	1.035	11.741	2.350	**123.490**
McRoberts (FH-5)	0.286	0.331	0.081	1.950	4.968	5.446	4.190	6.368	10.900	6.950	0.303	0.250	**42.023**
Housing Plant (FH-6)	--	--	2.191	6.042	10.842	9.257	9.443	4.978	0.475	13.112	3.010	4.013	**63.363**
Mather System Totals	**7.613**	**10.298**	**15.854**	**19.932**	**35.649**	**41.105**	**52.552**	**39.682**	**62.832**	**54.500**	**18.081**	**12.773**	**370.871**

Notes: All quantities are in millions of gallons.

-- = No flow for period
MG = million gallons
SCWA = Sacramento County Water Agency

TABLE 2-6

Cal Am Production Well Totals

Well Name	Jan 2013 (MG)	Feb 2013 (MG)	Mar 2013 (MG)	Apr 2013 (MG)	May 2013 (MG)	Jun 2013 (MG)	Jul 2013 (MG)	Aug 2013 (MG)	Sep 2013 (MG)	Oct 2013 (MG)	Nov 2013 (MG)	Dec 2013 (MG)	Total (MG)
Branch Center System (combined production totals)													
South Port (OFB-54)	0.085	0.017	0.014	--	0.698	0.025	3.041	4.680	0.022	0.079	0.020	0.012	**8.693**
Sutters Gold (OFB-61)	0.197	0.006	0.037	--	0.014	--	0.002	0.008	0.033	--	0.023	0.018	**0.338**
Tallyho #1 (OFB-58)	--	--	0.002	--	--	--	0.002	--	0.002	--	0.049	0.002	**0.057**
Tallyho #2 (OFB-56)	0.000	0.038	0.032	10.720	56.770	40.169	44.813	52.273	53.240	38.969	0.066	0.054	**297.144**
Westporter (OFB-55)	1.694	0.021	0.039	1.105	15.196	5.925	0.030	--	0.029	0.843	0.021	0.016	**24.919**
Wildrose (OFB-63)	6.352	0.042	0.313	0.150	2.151	7.051	10.679	14.163	7.139	7.687	16.198	0.013	**71.938**
Chettenham (OFB-66)	0.008	--	0.027	--	--	0.030	--	--	0.024	--	0.022	0.013	**0.124**
Gould (OFB-31)	--	--	--	--	--	--	--	--	--	--	0.127	0.634	**0.761**
Mars (OFB-27)	11.760	14.471	17.430	17.549	16.786	15.363	17.353	16.398	16.101	17.326	16.733	14.741	**192.011**
Moonbeam (OFB-04)	0.015	0.017	0.041	0.012	0.008	0.014	0.006	0.012	--	--	0.013	0.011	**0.149**
Nut Plains (OFB-32)	14.451	20.578	38.292	34.870	38.472	33.918	33.025	34.056	22.605	18.207	16.654	5.055	**310.183**
Oaken Bucket (OFB-49)	0.057	--	--	--	0.037	38.913	44.444	44.910	28.267	4.865	0.056	0.332	**161.881**
Rockingham (OFB-35)	19.225	17.297	19.370	19.110	19.504	18.735	19.060	18.893	17.681	18.196	17.044	17.563	**221.678**
Countryside (OFB-65)	0.302	--	1.308	0.925	20.657	45.718	49.231	49.429	46.592	47.995	37.832	48.217	**348.206**
Caldera (OFB-70)	0.228	0.008	0.129	--	0.033	--	0.018	--	0.051	--	0.038	0.030	**0.535**
Montezuma (OFB-71)	0.015	0.017	0.041	0.012	0.008	0.014	0.006	0.012	--	--	0.013	0.011	**0.149**
Totals	**54.389**	**52.512**	**77.075**	**84.453**	**170.334**	**205.875**	**221.71**	**234.834**	**191.786**	**154.167**	**104.909**	**86.722**	**1638.766**

Notes:

Production totals shown represent all water pumped for the following purposes: to support the system, flushing, main breaks, and for sampling purposes.

MG = million gallons

-- = No flow for the period

Table 3-1
2013 ANALYTICAL DETECTION SUMMARY
NORTHEAST PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,2-Dichloropropane	5.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Tetrachloroethene	5.0
cis-1,2-Dichloroethene	6.0

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
MAFB-111	WT/B	Tetrachloroethene	NS	NS	NS	1
MAFB-132	WT/B	Tetrachloroethene	NS	**33**	NS	**32**
		cis-1,2-Dichloroethene	NS	**33**	NS	**41**
MAFB-133	WT/B	Tetrachloroethene	NS	3.9	NS	NS
		cis-1,2-Dichloroethene	NS	1.8	NS	NS
MAFB-136	WT/B	Tetrachloroethene	NS	1.3	NS	NS
		cis-1,2-Dichloroethene	NS	2.1	NS	NS
MAFB-288	B	Tetrachloroethene	NS	0.6	NS	NS
		cis-1,2-Dichloroethene	NS	0.7	NS	NS
MAFB-398	WT/B	Tetrachloroethene	NS	3.1J	NS	NS
		cis-1,2-Dichloroethene	NS	0.4FJ	NS	NS
MAFB-399	C	Tetrachloroethene	NS	3	NS	NS
		cis-1,2-Dichloroethene	NS	2.1	NS	NS
MAFB-400	C	Tetrachloroethene	NS	4.1	NS	NS
		cis-1,2-Dichloroethene	NS	2.3	NS	NS
MAFB-438	WT/B/C	Tetrachloroethene	NS	4.5J	NS	NS
		cis-1,2-Dichloroethene	NS	1J	NS	NS
MAFB-465	WT/C	Tetrachloroethene	**22**	**19**	**13**	NS
		cis-1,2-Dichloroethene	**26**	**23**	**19**	NS
MAFB-398C	C	Tetrachloroethene	NS	**8.9**	NS	NS
		1,2-Dichloropropane	NS	1F	NS	NS
		cis-1,2-Dichloroethene	NS	**12**	NS	NS

Note: values in **bol**d exceed the cleanup level for that compound
COC = contaminant of concern
F = estimated concentration between detection limit and reporting limit
J = estimated concentration
NS = not sampled
µg/L = micrograms per liter

Table 3-2
2013 ANALYTICAL DETECTION SUMMARY
NORTHEAST LANDFILLS MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
MAFB-111	WT/B	Tetrachloroethene	NS	NS	NS	1
MAFB-132	WT/B	1,2-Dichloroethane	NS	0.2 F	NS	0.1 F
		Alkalinity	NS	180	NS	210
		Alkalinity,bicarbonate (as CaCO3)	NS	180	NS	NS
		Barium	NS	46	NS	46
		Bicarbonate	NS	NS	NS	210
		Chloride	NS	28	NS	27
		Chromium	NS	10	NS	6.6
		cis-1,2-Dichloroethene	NS	33	NS	41
		Cobalt	NS	12	NS	5.7
		Fluoride	NS	0.067 F	NS	0.097 F
		Lead	NS	1.3 BF	NS	<1.2
		Manganese	NS	290	NS	NS
		Mercury	NS	0.22	NS	<.036
		Molybdenum	NS	NS	NS	2.6 F
		Nickel	NS	230	NS	170 J
		Silver	NS	0.66 FJ	NS	<.9
		Sulfate	NS	3.7	NS	3.5
		Sulfide	NS	0.13	NS	<.006 M
		Tetrachloroethene	NS	33	NS	32
		Total Dissolved Solids	NS	260 J	NS	260 J
		Trichloroethene	NS	7	NS	7.6
		Vanadium	NS	2.2 F	NS	2.6 F
		Zinc	NS	7 F	NS	<1.2
MAFB-133	WT/B	Alkalinity	NS	92	NS	NS
		Barium	NS	21	NS	NS
		Bicarbonate	NS	92	NS	NS
		Chloride	NS	4.5	NS	NS
		Chromium	NS	2 F	NS	NS
		cis-1,2-Dichloroethene	NS	1.8	NS	NS
		Fluoride	NS	0.092 F	NS	NS
		Lead	NS	1.1 BF	NS	NS
		Manganese	NS	0.75 F	NS	NS
		Mercury	NS	0.082 BF	NS	NS
		Nickel	NS	6.2	NS	NS
		Sulfate	NS	11	NS	NS
		Sulfide	NS	0.01 F	NS	NS
		Tetrachloroethene	NS	3.9	NS	NS
		Total Dissolved Solids	NS	120 J	NS	NS
		Trichloroethene	NS	0.6	NS	NS
		Vanadium	NS	6.5	NS	NS
		Zinc	NS	2.7 F	NS	NS
MAFB-136	WT/B	Alkalinity	NS	54	NS	NS
		Alkalinity,bicarbonate (as CaCO3)	NS	54	NS	NS

Table 3-2
2013 ANALYTICAL DETECTION SUMMARY
NORTHEAST LANDFILLS MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
		Barium	NS	29	NS	NS
		Chloride	NS	30	NS	NS
		Chromium	NS	9.9	NS	NS
		cis-1,2-Dichloroethene	NS	2.1	NS	NS
		Cobalt	NS	0.68 F	NS	NS
		Fluoride	NS	0.13	NS	NS
		Manganese	NS	11	NS	NS
		Nickel	NS	160	NS	NS
		Sulfate	NS	9.4	NS	NS
		Sulfide	NS	0.16	NS	NS
		Tetrachloroethene	NS	1.3	NS	NS
		Total Dissolved Solids	NS	180 J	NS	NS
		Trichloroethene	NS	0.4 F	NS	NS
		Vanadium	NS	2.1 F	NS	NS
MAFB-288	B	Alkalinity	NS	37	NS	NS
		Alkalinity,bicarbonate (as CaCO3)	NS	37	NS	NS
		Barium	NS	13	NS	NS
		Cadmium	NS	1.1 F	NS	NS
		Chloride	NS	3.7	NS	NS
		Chromium	NS	1.8 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.7	NS	NS
		Fluoride	NS	0.15	NS	NS
		Manganese	NS	0.42 F	NS	NS
		Sulfate	NS	3.7	NS	NS
		Sulfide	NS	0.008 F	NS	NS
		Tetrachloroethene	NS	0.6	NS	NS
		Total Dissolved Solids	NS	110 J	NS	NS
		Vanadium	NS	7.4	NS	NS
		Zinc	NS	3.5 F	NS	NS
MAFB-398	WT/B	Alkalinity	NS	190	NS	NS
		Barium	NS	28	NS	NS
		Bicarbonate	NS	190	NS	NS
		Chloride	NS	5.5	NS	NS
		Chromium	NS	0.74 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.4 FJ	NS	NS
		Fluoride	NS	0.023 F	NS	NS
		Lead	NS	0.92 BF	NS	NS
		Mercury	NS	0.092 BF	NS	NS
		Sulfate	NS	12	NS	NS
		Tetrachloroethene	NS	3.1 J	NS	NS
		Total Dissolved Solids	NS	240 J	NS	NS
		Trichloroethene	NS	0.5 J	NS	NS
		Vanadium	NS	6.6	NS	NS
		Zinc	NS	5.5 F	NS	NS

Table 3-2
2013 ANALYTICAL DETECTION SUMMARY
NORTHEAST LANDFILLS MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
MAFB-398C	C	1,2-Dichloroethane	NS	0.2 FJ	NS	NS
		1,2-Dichloropropane	NS	1 F	NS	NS
		Alkalinity	NS	140	NS	NS
		Barium	NS	62	NS	NS
		Bicarbonate	NS	140	NS	NS
		Chloride	NS	12	NS	NS
		Chromium	NS	2.2 F	NS	NS
		cis-1,2-Dichloroethene	NS	12	NS	NS
		Fluoride	NS	0.047 F	NS	NS
		Lead	NS	1.5 BF	NS	NS
		Manganese	NS	0.74 F	NS	NS
		Mercury	NS	0.079 BF	NS	NS
		Nickel	NS	1.4 F	NS	NS
		Sulfate	NS	4.5	NS	NS
		Sulfide	NS	0.04 F	NS	NS
		Tetrachloroethene	NS	8.9	NS	NS
		Total Dissolved Solids	NS	200 J	NS	NS
		Trichloroethene	NS	1.9	NS	NS
		Vanadium	NS	5	NS	NS
		Zinc	NS	7.2 F	NS	NS
MAFB-399	C	Alkalinity	NS	55	NS	NS
		Barium	NS	32	NS	NS
		Bicarbonate	NS	55	NS	NS
		Chloride	NS	5.1	NS	NS
		Chromium	NS	1.9 F	NS	NS
		cis-1,2-Dichloroethene	NS	2.1	NS	NS
		Fluoride	NS	0.057 F	NS	NS
		Lead	NS	1 BF	NS	NS
		Manganese	NS	0.6 F	NS	NS
		Nickel	NS	1.2 F	NS	<.99
		Sulfate	NS	3.7	NS	NS
		Sulfide	NS	0.02 F	NS	NS
		Tetrachloroethene	NS	3	NS	NS
		Total Dissolved Solids	NS	120 J	NS	NS
		Trichloroethene	NS	0.5	NS	NS
		Vanadium	NS	8.6	NS	NS
		Zinc	NS	5.7 F	NS	NS
MAFB-400	C	Alkalinity	NS	430	NS	NS
		Barium	NS	130	NS	NS
		Bicarbonate	NS	430	NS	NS
		Cadmium	NS	1.3 F	NS	NS
		Chloride	NS	53	NS	NS
		Chromium	NS	0.66 F	NS	NS
		cis-1,2-Dichloroethene	NS	2.3	NS	NS

Table 3-2
2013 ANALYTICAL DETECTION SUMMARY
NORTHEAST LANDFILLS MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
		Copper	NS	2.2 F	NS	NS
		Fluoride	NS	0.021 F	NS	NS
		Lead	NS	4.9 BF	NS	NS
		Manganese	NS	1.4 F	NS	NS
		Nickel	NS	2.7 F	NS	6.3 J
		Sulfate	NS	15	NS	NS
		Sulfide	NS	0.007 F	NS	NS
		Tetrachloroethene	NS	4.1	NS	NS
		Total Dissolved Solids	NS	330 J	NS	NS
		Trichloroethene	NS	0.8	NS	NS
		Vanadium	NS	3.3 F	NS	NS
		Zinc	NS	4.8 F	NS	NS
MAFB-438	WT/B/C	cis-1,2-Dichloroethene	NS	1 J	NS	NS
		Tetrachloroethene	NS	4.5 J	NS	NS
		Trichloroethene	NS	0.5 FJ	NS	NS

Note: All concentrations are reported in µg/L. Cleanup levels for VOCs at the Northeast Landfill Area are presented in Tabl
B = analyte found in blank sample, result considered not detected
F = estimated concentration between detection limit and reporting limit
J = estimated concentration
NS = not sampled
µg/L = micrograms per liter

Table 3-3
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 LANDFILL MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Analyte	1Q13	2Q13	3Q13	4Q13
7-BV-02	PERCHED	1,1-Dichloroethene	NS	0.6	NS	NS
		1,2-Dichloroethane	NS	4.2	NS	NS
		1,2-Dichloropropane	NS	5.5	NS	NS
		1,4-Dichlorobenzene	NS	1.7	NS	NS
		cis-1,2-Dichloroethene	NS	1.5	NS	NS
		Tetrachloroethene	NS	2.1	NS	NS
		Trichloroethene	NS	16	NS	NS
		Vinyl Chloride	NS	0.5 F	NS	NS
		Tetrachloroethene	NS	2.3	NS	NS
		Trichloroethene	NS	3.3	NS	NS
		Tetrachloroethene	NS	1.6	NS	NS
		Trichloroethene	NS	12	NS	NS
		Antimony	NS	2.7 F	NS	NS
		Barium	NS	37	NS	NS
		Chromium	NS	0.81 F	NS	NS
		Diesel	NS	45 F	NS	NS
		Gasoline	NS	14 BF	NS	NS
		Lead	NS	1.2 BF	NS	NS
		Manganese	NS	1.8 F	NS	NS
		Nickel	NS	1.5 F	NS	NS
		Tetrachloroethene	NS	0.4 F	NS	NS
		Trichloroethene	NS	1.8	NS	NS
		Vanadium	NS	5.2	NS	NS
		Zinc	NS	2.7 F	NS	NS
7-EW-1	B	Alkalinity	NS	97	NS	NS
		Alkalinity,bicarbonate (as CaCO3)	NS	97	NS	NS
		Calcium	NS	21000	NS	NS
		Chloride	NS	9.4	NS	NS
		cis-1,2-Dichloroethene	NS	0.3 F	NS	NS
		Copper	NS	1.9 F	NS	NS
		Gasoline	NS	13 F	NS	NS
		Magnesium	NS	11000	NS	NS
		Manganese	NS	0.24 F	NS	NS
		Nitrite, Nitrate-Nonspecific	NS	2.9	NS	NS
		Sodium	NS	12000	NS	NS
		Sulfate	NS	10	NS	NS
		Tetrachloroethene	NS	0.9	NS	NS
		Total Dissolved Solids	NS	180 J	NS	NS
		Total Hardness	NS	100	NS	NS
		Trichloroethene	NS	5.3	NS	NS
		Zinc	NS	10 F	NS	NS
7-EW-2	B	1,2-Dichloroethane	NS	1.2	NS	NS
		1,2-Dichloropropane	NS	0.4 F	NS	NS
		Alkalinity	NS	150	NS	NS

Table 3-3
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 LANDFILL MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Analyte	1Q13	2Q13	3Q13	4Q13
		Alkalinity,bicarbonate (as CaCO3)	NS	150	NS	NS
		Calcium	NS	35000	NS	NS
		Chloride	NS	9.2	NS	NS
		cis-1,2-Dichloroethene	NS	1.9	NS	NS
		Copper	NS	1.4 F	NS	NS
		Gasoline	NS	21 F	NS	NS
		Magnesium	NS	16000	NS	NS
		Nitrite, Nitrate-Nonspecific	NS	2.2	NS	NS
		Sodium	NS	15000	NS	NS
		Sulfate	NS	28	NS	NS
		Tetrachloroethene	NS	2.2	NS	NS
		Total Dissolved Solids	NS	260 J	NS	NS
		Total Hardness	NS	160	NS	NS
		Trichloroethene	NS	16	NS	NS
		Zinc	NS	8.6 F	NS	NS
7-PZ-37P	PERCHED	1,1-Dichloroethane	NS	0.4 FJ	NS	NS
		Barium	NS	41	NS	NS
		Cadmium	NS	0.36 F	NS	NS
		Chromium	NS	1.4 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.2 FJ	NS	NS
		Cobalt	NS	0.42 F	NS	NS
		Diesel	NS	83 B	NS	NS
		Gasoline	NS	26 BF	NS	NS
		Manganese	NS	2100	NS	NS
		Mercury	NS	0.048 F	NS	NS
		Nickel	NS	6.3	NS	NS
		Tetrachloroethene	NS	3.8 J	NS	NS
		Trichloroethene	NS	4.6 J	NS	NS
		Vanadium	NS	3.5 F	NS	NS
		Zinc	NS	1.5 F	NS	NS
7-PZ-38P	PERCHED	Barium	NS	35	NS	NS
		Diesel	NS	32 F	NS	NS
		Lead	NS	1.1 BF	NS	NS
		Manganese	NS	38	NS	NS
		Mercury	NS	0.047 F	NS	NS
		Nickel	NS	5.1 J	NS	NS
		Vanadium	NS	2.9 F	NS	NS
		Zinc	NS	17 FJ	NS	NS
MAFB-042	WT/B	Trichloroethene	NS	NS	0.3 F	NS
MAFB-056	D	Trichloroethene	NS	0.2 FJ	NS	NS
MAFB-059	B	Trichloroethene	NS	0.3 FJ	NS	NS
MAFB-149	WT/B	1,1-Dichloroethene	NS	0.7	NS	NS
		Barium	NS	27	NS	NS
		Cadmium	NS	1.2 F	NS	NS

Table 3-3
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 LANDFILL MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Analyte	1Q13	2Q13	3Q13	4Q13
		Chromium	NS	3.8 F	NS	NS
		Diesel	NS	23 BF	NS	NS
		Gasoline	NS	13 F	NS	NS
		Lead	NS	3.2 BF	NS	NS
		Manganese	NS	0.96 F	NS	NS
		Nickel	NS	7.3	NS	NS
		Vanadium	NS	12	NS	NS
		Zinc	NS	4.6 F	NS	NS
MAFB-371C	C	Tetrachloroethene	NS	NS	0.3 F	NS
		Trichloroethene	NS	NS	4.4	NS
MAFB-372B	B	cis-1,2-Dichloroethene	NS	NS	0.3 F	NS
		Tetrachloroethene	NS	NS	1	NS
		Trichloroethene	NS	NS	4.8	NS
MAFB-392	C	1,2-Dichloroethane	NS	0.8	NS	NS
		1,2-Dichloropropane	NS	1.3	NS	NS
		cis-1,2-Dichloroethene	NS	1	NS	NS
		Tetrachloroethene	NS	1.6	NS	NS
		Trichloroethene	NS	6.3	NS	NS
MAFB-393	C	1,1-Dichloroethane	NS	0.2 F	NS	NS
		1,2-Dichloroethane	NS	0.4 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.9	NS	NS
		Tetrachloroethene	NS	0.2	NS	NS
		Trichloroethene	NS	1.9	NS	NS
MAFB-394	C	1,1-Dichloroethene	NS	0.2 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.8	NS	NS
		Tetrachloroethene	NS	3.2	NS	NS
		Trichloroethene	NS	16	NS	NS
MAFB-395	C	Tetrachloroethene	NS	0.5 FJ	NS	NS
		Trichloroethene	NS	1.9 J	NS	NS
MAFB-396	B	Tetrachloroethene	NS	0.4 FJ	NS	NS
MAFB-396	B	Trichloroethene	NS	1.6 J	NS	NS
MAFB-444	B	Tetrachloroethene	NS	0.3 FJ	NS	NS
		Trichloroethene	NS	1.3 J	NS	NS
MAFB-445	B	Tetrachloroethene	NS	0.6	NS	NS
		Trichloroethene	NS	2.6	NS	NS
MAFB-446	C	1,1-Dichloroethene	NS	0.6	NS	NS
		1,2-Dichloroethane	NS	0.3 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.9	NS	NS
		Tetrachloroethene	NS	3.5	NS	NS
		Trichloroethene	NS	21	NS	NS
MAFB-447	C	1,1-Dichloroethene	NS	0.2 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.2 F	NS	NS
		Tetrachloroethene	NS	1.7	NS	NS
		Trichloroethene	NS	11	NS	NS

Table 3-3
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 LANDFILL MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Analyte	1Q13	2Q13	3Q13	4Q13
MAFB-448	B	Tetrachloroethene	NS	0.7	NS	NS
		Trichloroethene	NS	3.4	NS	NS
MAFB-464	D	Trichloroethene	0.6	0.3 F	0.3 F	0.3 BF

Note: All concentrations are reported in µg/L. Cleanup levels for VOCs at the Site 7 are presented in Table 5-1. Upper backg
B = analyte found in blank sample, result considered not detected
F = estimated concentration between detection limit and reporting limit
J = estimated concentration
NS = not sampled
µg/L = micrograms per liter

TABLE 3-4

Calculated Background Concentrations for Metals
Northeast Landfill Area
Former Mather Air Force Base
Sacramento County, California

Analyte	Number of Samples	Min	Max	Mean	Standard Deviation	95th Percentile	99th Percentile	Distribution	95% UCL on the Mean	UTL[a]	Upper Background	Wells with Concentrations Exceeding Upper Background Limit in 2013
Antimony	10	0.068	2.0	1.3	0.70	1.96	1.99	Normal	1.7	3.3	3.3	None
Arsenic	11	0.13	5.6	1.8	1.6	4.2	5.3	Normal	2.6	6.2	6.2	None
Barium	62	8.8	516	137	145	354	486	Nonparametric	252	430	430	None
Beryllium	8	0.20	0.70	0.40	0.19	0.67	0.69	Normal	0.52	1.0	1.0	None
Cadmium	16	0.17	0.61	0.32	0.12	0.53	0.59	Normal	0.4	0.6	0.6	MAFB-288 (1.1F µg/L 2Q13) MAFB-400 (1.3F µg/L 2Q13)
Calcium	4	9,040	19,800	15,410	4,771	19,560	19,752	Normal	N/A	39,952	39,952	NS
Chromium	27	1.0	15	3.3	3.0	8.7	14	Nonparametric	5.8	10	10	None
Cobalt	2	0.06	0.22	0.14	0.11	0.21	0.22	N/A	N/A	N/A	ND	None
Copper	11	2.1	17	5.7	4.3	12	16	Lognormal[b]	8.3	27	27	None
Iron	3	73	503	341	234	497	502	N/A	N/A	N/A	ND	NS
Lead	30	1.3	9.2	2.9	1.9	7.3	9.2	Nonparametric	3.5	7.2	7.2	None
Magnesium	4	5,440	13,500	9,798	3,358	13,095	13,419	Normal	N/A	27,069	27,069	NS
Manganese	44	0.7	714	62	122	249	524	Lognormal	183	653	653	None
Mercury	2	0.11	0.11	0.11	0.0	N/A	N/A	N/A	N/A	N/A	ND	None
Nickel	28	1.3	4.0	2.3	0.60	3.6	3.9	Lognormal[b]	2.5	3.9	3.9	MAFB-132 (230 µg/L 2Q13, 170J µg/L 4Q13) MAFB-133 (6.2 µg/L 2Q13) MAFB-136 (160 µg/L 2Q13) MAFB-400 (6.3J µg/L 4Q13)
Selenium	11	0.021	7.0	3.0	2.4	6.3	6.9	Normal	4.3	10	10	None
Silver	6	0.25	0.78	0.51	0.19	0.75	0.77	Normal	0.66	1.2	1.2	None
Sodium	4	7,850	10,400	9,088	1,213	10,312	10,382	Normal	N/A	15,326	15,326	NS
Thallium	1	1.2	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	None
Vanadium	32	4.9	10	6.6	0.92	7.7	9.3	Lognormal[b]	6.8	8.7	8.7	None
Zinc	30	4.6	1,130	72	202	109	837	Nonparametric	439	521	521	None

Notes:
All units are micrograms per liter (µg/L)
Background calculations were originally presented in the 2nd Quarter 2005 Mather Groundwater Monitoring Report (MWH, 2005).
[a] UTL is identified as the 95% UCL on the 95th percentile.
[b] Data follow both gamma and lognormal distributions. For the purposes of selecting a 95% UCL on the mean, the recommended value from the ProUCL program was utilized. For selecting a UTL, the lognormal value was utilized.

F = estimated concentration below reporting limits
J = estimated concentraion
Max = maximum
Min = minimum
N/A = Not Applicable
ND = Not Determined
NS = Not Sampled. No samples analyzed for this constituent
UCL = Upper Confidence Limit
UTL = Upper Tolerance Limit

TABLE 3-5

Calculated Upper Background Concentration for General Mineral Constituents
Northeast Landfill Area
Former Mather Air Force Base
Sacramento County, California

Analyte	Units	Number of Samples	Min	Max	Mean	Standard Deviation	95th Percentile	99th Percentile	Distribution	95% UCL on the Mean	UTL[a]	Upper Background Limit	Wells Exceeding Background Limit in 2013
Alkalinity, bicarbonate	Mg/L	87	0.5	684	94	80	192	352	NON-PARAMETRIC	131	867	867	None
Alkalinity, carbonate	Mg/L	88	0.5	34.7	2.1	5.3	14	24	NON-PARAMETRIC	5.6	39	39	None
Alkalinity, total	Mg/L	104	26	684	94	73	180	295	NON-PARAMETRIC	125	864	864	None
Chloride	Mg/L	104	2.3	120	13	17	29	94	NON-PARAMETRIC	20	145	145	None
Fluoride	Mg/L	100	0.05	0.32	0.12	0.06	0.23	0.31	NON-PARAMETRIC	0.1	0.5	1	None
Hardness as CaCO3	Mg/L	4	0.5	93	26	45	80	90	GAMMA	337	225	225	None
Nitrogen, nitrate	Mg/L	48	0.89	20	3	3	3.80	13	NON-PARAMETRIC	3.8	26.0	26	None
Nitrogen, nitrate and nitrite	Mg/L	14	2.2	3.7	3	0.44	3.51	3.66	NORMAL	3.2	11.4	11	None
Solids, total dissolved	Mg/L	104	5	370	179	54	287	310	NON-PARAMETRIC	188	715	715	None
Sulfate	Mg/L	104	5.5	35	11	6	28	35	NON-PARAMETRIC	13	57	57	None
Sulfide, total	Mg/L	100	0.04	3.1	0.46	0.6	1.62	2.90	NON-PARAMETRIC	0.9	4.0	4	None

Notes:
[a] UTL is identified as the 95% UCL on the 95th Percentile.
Mg/L = milligrams per liter
Max = maximum
Min = minimum
UCL = Upper Confidence Limit
UTL = Upper Tolerance Limit

TABLE 3-6

Calculated Background Concentrations for Metals
Site 7 Landfill Area
Former Mather Air Force Base
Sacramento County, California

Analyte	Number of Samples	Min	Max	Mean	95% UCL on the Mean	UTL[a]	Upper Background Limit	Wells with Concentrations Exceeding Upper Background Limit in 2013
Antimony	14	< 60	< 60	NA	NA	NA	< 60	None
Arsenic	14	< 5.0	< 5.0	NA	NA	NA	< 5.0	None
Barium	14	25	693	130	391	715	715	None
Beryllium	14	< 3	< 3	NA	NA	NA	< 3	None
Cadmium	14	26	26	4	11.6	14.9	14.9	None
Calcium	2	19,900	118,000	68,950	NA	NA	ND	NS
Chromium	14	10	26	8	15.3	24.0	24.0	None
Cobalt	14	< 50	< 50	NA	NA	NA	< 50	None
Copper	14	12	12	5	6.3	10.3	10.3	None
Iron	2	29	29	32	NA	NA	29.1	NS
Lead	23	3	5	2	2.6	4.1	4.1	None
Magnesium	2	3,850	67,300	35,575	NA	NA	ND	NS
Manganese[b]	16	1	8,430	534	5,772	5,848	5,848	None
Mercury	14	0	0	0	0.1	0.2	0.2	None
Nickel	14	< 40	< 40	NA	NA	NA	< 40	None
Potassium	1	2,280	2,280	NA	NA	NA	ND	NS
Selenium	14	< 5.0	< 5.0	NA	NA	NA	< 5.0	None
Silver	14	< 10	< 10	NA	NA	NA	< 10	None
Sodium	1	32,400	32,400	NA	NA	NA	ND	NS
Thallium	23	< 1.0	< 1.0	NA	NA	NA	< 1.0	None
Vanadium	14	< 50	< 50	NA	NA	NA	< 50	None
Zinc	16	15	113	36	64	101	101	None
Background Calculations for Manganese in the Perched Zone at Site 7[c]								
Manganese	83	8	9,380	2,911	5,928	15,068	15,068	None

Notes:
All units are micrograms per liter (µg/L)
[a] UTL is identified as the 95% UCL on the 95th Percentile.
[b] Includes manganese data from wells MAFB-148, -183, and -254
[c] Includes manganese data from perched-zone wells 7-BV-01, 7-BV-02, 7-BV-04, 7-BV-06, 7-PZ-37P, 7-PZ-38P, MAFB-044, and MAFB-189
Min and Max were for detected analytes only. The Mean was calculated using values of 1/2 the reporting limit when a given analyte was not detecteed in a sample
Background calculations were originally presented in the 2nd Quarter 2005 Mather Groundwater Monitoring Report (MWH, 2005).
Max = maximum
Min = Minimum
NA = Not Applicable
ND = Not Determined
NS = Not Sampled. No samples analyzed for this constituent
UCL = Upper Confidence Limit
UTL = Upper Tolerance Limit
< = less than

Table 4-1
2013 ANALYTICAL DETECTION SUMMARY
AC&W PLUME TCE MONITORING
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
Trichloroethene	5

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
ACW AT-1	C	Chloroform	NS	0.2 FJ	NS	NS
		Trichloroethene	NS	**23 J**	NS	NS
ACW AT-2	C	Trichloroethene	NS	**19 J**	NS	NS
ACW EW-1	C	Trichloroethene	NS	**13 J**	NS	NS
ACW EW-2	C	Trichloroethene	NS	2.1 J	NS	0.3 FJ
ACW EW-3	C	Trichloroethene	NS	1.7 J	NS	NS
ACW EW-6R	C	Trichloroethene	NS	3.4	NS	**8.7 J**
ACW PZ-08C	C	Trichloroethene	NS	1.3	NS	NS
ACW PZ-10C	C	Trichloroethene	NS	**6.4**	NS	**9.8**
MAFB-053	C	Trichloroethene	NS	0.4 F	NS	NS
MAFB-194	C	Trichloroethene	NS	**5.1**	NS	NS
MAFB-196	C	Trichloroethene	NS	**9.6**	NS	**21**
MAFB-301	C	Trichloroethene	NS	1.2	NS	NS
MAFB-402	WT/C	Trichloroethene	NS	2.7	NS	NS
MAFB-403	WT/C	Trichloroethene	NS	4.2	NS	NS
MAFB-408	WT/C	Trichloroethene	NS	0.7	NS	NS
MAFB-432	WT/C	Trichloroethene	NS	4.4 J	NS	NS
MAFB-453	WT/C	cis-1,2-Dichloroethene	NS	0.9	NS	NS
		Trichloroethene	NS	**35**	NS	NS
MAFB-453C	C	Trichloroethene	NS	3.3	NS	NS
MAFB-454	WT/C	Trichloroethene	NS	1.6 J	NS	NS

TABLE 4-2

2013 Operation Rates and TCE Mass Removal
By AC&W Plume Treatment System and Extraction Wells
Former Mather Air Force Base
Sacramento, County, California

Well	HSU	Set Point Flow Rate (gpm)	Quarterly Avg. Flow Rate (gpm)				TCE Concentration (µg/L)				Yearly TCE Mass Removed (lbs)
			1Q13*	2Q13	3Q13	4Q13	1Q13	2Q13	3Q13	4Q13	
ACW Plant Influent (ACW PTI)	-	-	18.3	105.4	91.5	67.0	6.1	8.0	9.8	11.0	2.70
ACW AT-1	WT/C	5.0	--	5.0	4.9	4.7	NS	23	NS	NS	0.49
ACW AT-2	WT/C	11.0	--	11.8	9.5	9.6	NS	19	NS	NS	0.86
ACW EW-1	WT/C	12.0	--	14.9	15.9	19.0	NS	13	NS	NS	0.95
ACW EW-2	WT/C	18.0	--	24.8	26.0	0**	NS	2.1	NS	0.3	0.13
ACW EW-3	WT/C	30.0	--	23.0	24.5	25.4	NS	1.7	NS	NS	0.18
ACW EW-6R	WT/C	26.0	--	25.9	13.7	7.3	NS	3.4	NS	8.7	0.41

Notes:

* The system was down due to vandalism for most of the quarter. Restarted on 3/15/13. No individual extraction well data available for 1Q13.

** ACW EW-2 was shut down proir to 4Q13.

Mass removed at plant calculated from quarterly influent samples. Mass removed at extraction wells calculated from scheduled sampling events at the well heads.

Discrepancies in estimates for mass removal for the plant and the sum of the extraction wells may exist and are considered normal.

µg/L = micrograms per liter

gpm = gallons per minute

HSU = hydrostartigraphic unit

lbs = pounds

NS = not sampled

TCE = trichloroethene

TABLE 4-3

2013 AC&W and Mather Lake Discharge Monitoring
Former Mather Air Force Base
Sacramento County, California

Date Sampled	Sample Location	Specific Conductivity (µmhos/cm)	pH (pH units)	Temperature (Degrees Celsius)	TCE Concentration (µg/L)	Total VOCs Concentration (µg/L)
03/15/13	R-2	103	7.96	22.6	<0.10	ND
03/15/13	AC&W Effluent	114	7.78	23.6	<0.10	ND
04/04/13	R-2	99	8.09	18.1	<0.10	ND
04/04/13	AC&W Effluent	91	7.79	18.3	<0.10	ND
07/10/13	R-2	165	8.79	24.8	<0.10	1.1[a]
07/10/13	AC&W Effluent	130	8.29	23.0	<0.10	ND
10/02/13	R-2	155	8.58	21.1	<0.10	ND
10/02/13	AC&W Effluent	122	8.41	19.6	<0.10	ND

Notes:

[a] chloroform

AC&W = Aircraft Control and Warning
ND = no contaminants detected
pH = a measure of the activity of hydrogen ions
R-2 = Mather Lake downgradient sampling location (before spillway)
TCE = trichloroethane
VOC = volatile organic compounds
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter

Table 5-1
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6
1,2-Dichloroethane	0.5
1,4-Dichlorobenzene	5.0
Benzene	1.0
Chloromethane	3.0
Diesel	100.0
Tetrachloroethene	5.0
Trichloroethene	5.0
Vinyl Chloride	0.5
cis-1,2-Dichloroethene	6.0

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
7-BV-02	PERCHED	1,1-Dichloroethene	NS	0.600	NS	NS
		1,2-Dichloroethane	NS	**4.20**	NS	NS
		1,4-Dichlorobenzene	NS	**1.70**	NS	NS
		cis-1,2-Dichloroethene	NS	1.50	NS	NS
		Tetrachloroethene	NS	2.10	NS	NS
		Trichloroethene	NS	**16**	NS	NS
		Vinyl Chloride	NS	0.500 F	NS	NS
7-BV-07	PERCHED	Tetrachloroethene	NS	2.30	NS	NS
		Trichloroethene	NS	3.30	NS	NS
7-BV-08	PERCHED	Tetrachloroethene	NS	1.60	NS	NS
		Trichloroethene	NS	**12**	NS	NS
7-BV-13	PERCHED	Diesel	NS	45 F	NS	NS
		Tetrachloroethene	NS	0.400 F	NS	NS
		Trichloroethene	NS	1.80	NS	NS
7-EW-1	B	cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	0.900	NS	NS
		Trichloroethene	NS	**5.30**	NS	NS
7-EW-2	B	1,2-Dichloroethane	NS	**1.20**	NS	NS
		cis-1,2-Dichloroethene	NS	1.90	NS	NS
		Tetrachloroethene	NS	2.20	NS	NS
		Trichloroethene	NS	**16**	NS	NS
7-PZ-37P	PERCHED	cis-1,2-Dichloroethene	NS	0.200 FJ	NS	NS
		Diesel	NS	83 B	NS	NS
		Tetrachloroethene	NS	3.80 J	NS	NS
		Trichloroethene	NS	4.60 J	NS	NS
7-PZ-38P	PERCHED	Diesel	NS	32 F	NS	NS
MAFB-041	B	1,2-Dichloroethane	NS	**2.60**	NS	NS
		cis-1,2-Dichloroethene	NS	3.10	NS	NS
		Tetrachloroethene	NS	1.60	NS	NS
		Trichloroethene	NS	**11**	NS	NS
MAFB-042	WT/B	Trichloroethene	NS	NS	0.300 F	NS
MAFB-056	D	Trichloroethene	NS	0.200 FJ	NS	NS
MAFB-059	B	Trichloroethene	NS	0.300 FJ	NS	NS

Table 5-1
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6
1,2-Dichloroethane	0.5
1,4-Dichlorobenzene	5.0
Benzene	1.0
Chloromethane	3.0
Diesel	100.0
Tetrachloroethene	5.0
Trichloroethene	5.0
Vinyl Chloride	0.5
cis-1,2-Dichloroethene	6.0

MAFB-149	WT/B	1,1-Dichloroethene	NS	0.700	NS	NS
		Diesel	NS	23 BF	NS	NS
MAFB-284	B	1,2-Dichloroethane	NS	**0.600 J**	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 FJ	NS	NS
		Diesel	NS	35 BF	NS	NS
		Tetrachloroethene	NS	1.20 J	NS	NS
		Trichloroethene	NS	**6.80 J**	NS	NS
MAFB-371C	C	Tetrachloroethene	NS	NS	0.300 F	NS
		Trichloroethene	NS	NS	4.40	NS
MAFB-372B	B	cis-1,2-Dichloroethene	NS	NS	0.300 F	NS
		Tetrachloroethene	NS	NS	1	NS
		Trichloroethene	NS	NS	4.80	NS
MAFB-392	C	1,2-Dichloroethane	NS	**0.800**	NS	NS
		cis-1,2-Dichloroethene	NS	1	NS	NS
		Tetrachloroethene	NS	1.60	NS	NS
		Trichloroethene	NS	**6.30**	NS	NS
MAFB-393	C	1,2-Dichloroethane	NS	0.400 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.900	NS	NS
		Tetrachloroethene	NS	0.200	NS	NS
		Trichloroethene	NS	1.90	NS	NS
MAFB-394	C	1,1-Dichloroethene	NS	0.200 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.800	NS	NS
		Tetrachloroethene	NS	3.20	NS	NS
		Trichloroethene	NS	**16**	NS	NS
MAFB-395	C	Tetrachloroethene	NS	0.500 FJ	NS	NS
		Trichloroethene	NS	1.90 J	NS	NS
MAFB-396	B	Tetrachloroethene	NS	0.400 FJ	NS	NS
		Trichloroethene	NS	1.60 J	NS	NS
MAFB-413	WT/B	Diesel	NS	47 F	NS	NS
MAFB-444	B	Tetrachloroethene	NS	0.300 FJ	NS	NS
		Trichloroethene	NS	1.30 J	NS	NS
MAFB-445	B	Tetrachloroethene	NS	0.600	NS	NS
		Trichloroethene	NS	2.60	NS	NS
MAFB-446	C	1,1-Dichloroethene	NS	0.600	NS	NS

Table 5-1
2013 ANALYTICAL DETECTION SUMMARY
SITE 7 PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6
1,2-Dichloroethane	0.5
1,4-Dichlorobenzene	5.0
Benzene	1.0
Chloromethane	3.0
Diesel	100.0
Tetrachloroethene	5.0
Trichloroethene	5.0
Vinyl Chloride	0.5
cis-1,2-Dichloroethene	6.0

		1,2-Dichloroethane	NS	0.300 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.900	NS	NS
		Tetrachloroethene	NS	3.50	NS	NS
		Trichloroethene	NS	**21**	NS	NS
MAFB-447	C	1,1-Dichloroethene	NS	0.200 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	1.70	NS	NS
		Trichloroethene	NS	**11**	NS	NS
MAFB-448	B	Tetrachloroethene	NS	0.700	NS	NS
		Trichloroethene	NS	3.40	NS	NS
MAFB-464	D	Trichloroethene	0.600	0.300 F	0.300 F	0.300 F

Note: values in **bol**d exceed the cleanup level for that compound
B = analyte detected in "blank" control sample, result considered not detected
COC = contminant of concern
F = estimated concentration between detection limit and reporting limit
J = estimated concentration
NS = not sampled
µg/L = micrograms per liter

TABLE 5-2

2013 Operation Rates and Volatile Organic COC Mass Removed by the Site 7 Plume Treatment System and Extraction Wells Former Mather Air Force Base Sacramento County, California

WELL ID	HSU	Set Point Flow Rate (gpm)	Quarterly Avg. Flow Rate (gpm)				VOC Concentration (µg/L)				Yearly COC Mass Removed as VOCs (lbs)
			1Q13	2Q13	3Q13	4Q13*	1Q13	2Q13	3Q13	4Q13	
Site 7 Plant Influent (PTI)	-	-	43.3	40.6	42.4	41.2	16.3	15.2	14.7	15.5	2.83
7-IW-01	B	20	7.7	5.7	7.5	17.2	N/A	N/A	N/A	N/A	N/A
7-IW-02	B	20	14.7	12.5	15.0	8.9	N/A	N/A	N/A	N/A	N/A
7-IW-03	B	20	7.7	9.6	11.0	9.5	N/A	N/A	N/A	N/A	N/A
7-IW-04	B	14	11.3	11.7	7.4	13.4	N/A	N/A	N/A	N/A	N/A
7-EW-1	C	28	21.0	20.1	21.6	20.9	NS	6.2	NS	NS	0.57
7-EW-2	C	32	22.3	20.5	20.8	20.3	NS	21.3	NS	NS	1.96

Notes:

* 4Q13 flow rates were estimated due to loss of data when the system shut down in December.

Mass removed at plant calculated from quarterly influent samples. Mass removed at extraction wells calculated from scheduled sampling events at the well heads.

Discrepancies in estimates for mass removal for the plant and the sum of the extraction wells may exist and are considered normal.

COC - contaminant of concern
gpm - gallons per minute
HSU = hydrostatigraphic unit
ID = identification
lbs = pounds

N/A - not analyzed
NS - not sampled
VOC - volatile organic compound
µg/L - micrograms per liter

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

Well ID	Unit	ANALYTE	1Q13	2Q13	3Q13	4Q13
FFS MW15-6	D	Carbon Tetrachloride	NS	**0.700**	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	2.60	NS	NS
		Trichloroethene	NS	4.60	NS	NS
MAFB-033	WT/Bu	1,2-Dichloroethane	NS	0.400 F	NS	NS
		cis-1,2-Dichloroethene	NS	1.70	NS	NS
		Tetrachloroethene	NS	0.300 F	NS	NS
		Trichloroethene	NS	**15**	NS	NS
MAFB-047	WT/Bu	Tetrachloroethene	NS	0.200 F	NS	NS
		Trichloroethene	NS	0.400 F	NS	NS
MAFB-048	WT/A	Tetrachloroethene	NS	0.900	NS	NS
		Trichloroethene	NS	0.200 F	NS	NS
MAFB-062	D	Tetrachloroethene	NS	0.500 F	NS	NS
		Trichloroethene	NS	0.500 F	NS	NS
MAFB-063	D	Tetrachloroethene	NS	4.10	NS	NS
MAFB-101	B	Carbon Tetrachloride	NS	0.400 FJ	NS	NS
		Tetrachloroethene	NS	3.10 J	NS	NS
MAFB-102	D	Carbon Tetrachloride	NS	**2**	NS	NS
		cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	0.500	NS	NS
		Trichloroethene	NS	**8.20**	NS	NS
MAFB-104	D	Carbon Tetrachloride	NS	**0.900**	NS	NS
		Tetrachloroethene	NS	**15**	NS	NS
		Trichloroethene	NS	2	NS	NS
MAFB-164	B	Tetrachloroethene	NS	3	NS	NS
MAFB-167	B	Carbon Tetrachloride	NS	0.700	NS	NS
		Chloromethane	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	2.80	NS	NS
		Trichloroethene	NS	**8.20**	NS	NS
MAFB-168	WT/Bu	1,1-Dichloroethene	NS	0.200 F	NS	NS
		Carbon Tetrachloride	NS	0.400 F	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		cis-1,2-Dichloroethene	NS	0.900	NS	NS
		Tetrachloroethene	NS	2.20	NS	NS
		Trichloroethene	NS	**6.50**	NS	NS
MAFB-170	B	Tetrachloroethene	NS	0.200 FJ	NS	NS
		Trichloroethene	NS	0.200 FJ	NS	NS
MAFB-171	B	Tetrachloroethene	NS	0.600	NS	NS
		Trichloroethene	NS	1.40	NS	NS
MAFB-172	WT/Bu	Trichloroethene	NS	0.300 F	NS	NS
MAFB-173	B	Carbon Tetrachloride	NS	**0.600**	NS	NS
		Tetrachloroethene	NS	1.70	NS	NS
		Trichloroethene	NS	2.10	NS	NS
MAFB-175	B	Carbon Tetrachloride	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	**19**	NS	NS
		Trichloroethene	NS	0.600	NS	NS
MAFB-176	Bu	Tetrachloroethene	NS	0.200 F	NS	NS
		Trichloroethene	NS	1.50	NS	NS
MAFB-177	B	Carbon Tetrachloride	NS	0.500 F	NS	NS
		Tetrachloroethene	NS	**10**	NS	NS
		Trichloroethene	NS	0.600	NS	NS
MAFB-180	D	Carbon Tetrachloride	NS	**3.50**	NS	NS
		Tetrachloroethene	NS	**65**	NS	NS
MAFB-181	D	Carbon Tetrachloride	**2.80**	**2.5**	**3.20**	**3.10**
		Tetrachloroethene	**25**	**21**	**20**	**25**
MAFB-200	WT/A	Tetrachloroethene	NS	0.600	NS	NS
		Trichloroethene	NS	1.10	NS	NS
MAFB-201	WT/Bu	Tetrachloroethene	NS	0.200 F	NS	NS
		Trichloroethene	NS	0.400 F	NS	NS
MAFB-203	WT/A	1,1-Dichloroethene	NS	1.40	NS	NS
		Carbon Tetrachloride	NS	**1**	NS	NS
		cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	3.30	NS	NS
		Trichloroethene	NS	**13**	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

MAFB-205	WT/A	1,2-Dichloroethane	NS	0.200 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.500 F	NS	NS
		Trichloroethene	NS	0.900	NS	NS
MAFB-207	WT/A	Carbon Tetrachloride	NS	**2**	NS	NS
		cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	0.200 F	NS	NS
		Trichloroethene	NS	**8.90**	NS	NS
MAFB-211	WT/A	Trichloroethene	NS	1.30	NS	NS
MAFB-215	B	Carbon Tetrachloride	NS	0.500 F	NS	NS
		Tetrachloroethene	NS	5	NS	NS
		Trichloroethene	NS	**11**	NS	NS
MAFB-216	B	Trichloroethene	NS	0.400 F	NS	NS
MAFB-217	B	1,1-Dichloroethene	NS	0.300 F	NS	NS
		Carbon Tetrachloride	NS	**1.20**	NS	NS
		Tetrachloroethene	NS	1.20	NS	NS
		Trichloroethene	NS	**18**	NS	NS
MAFB-218	B	Carbon Tetrachloride	NS	**2.50**	NS	NS
		cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	3.60	NS	NS
		Trichloroethene	NS	4.60	NS	NS
MAFB-220	B	1,1-Dichloroethene	NS	0.600 M	NS	NS
		Carbon Tetrachloride	NS	**7.60**	NS	NS
		cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	2.90	NS	NS
		Trichloroethene	NS	**12**	NS	NS
MAFB-222	B	Carbon Tetrachloride	NS	0.400 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	2.10	NS	NS
		Trichloroethene	NS	1.60	NS	NS
MAFB-223	B	1,1-Dichloroethene	NS	0.300 F	NS	NS
		Carbon Tetrachloride	NS	**8.20**	NS	NS
		cis-1,2-Dichloroethene	NS	0.700	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		Tetrachloroethene	NS	4	NS	NS
		Trichloroethene	NS	**12**	NS	NS
MAFB-224	B	Carbon Tetrachloride	NS	**11**	NS	NS
		Tetrachloroethene	NS	0.900	NS	NS
		Trichloroethene	NS	**19**	NS	NS
MAFB-227	B	1,1-Dichloroethene	NS	0.500 F	NS	NS
		Carbon Tetrachloride	NS	**2.70**	NS	NS
		cis-1,2-Dichloroethene	NS	0.500	NS	NS
		Tetrachloroethene	NS	3.30	NS	NS
		Trichloroethene	NS	**17**	NS	NS
MAFB-228	B	Carbon Tetrachloride	NS	0.500 FJ	NS	NS
		Tetrachloroethene	NS	**6.20 J**	NS	NS
MAFB-229	B	Tetrachloroethene	NS	**23**	NS	NS
		Trichloroethene	NS	1	NS	NS
MAFB-231	B	Tetrachloroethene	NS	4.90 J	NS	NS
		Trichloroethene	NS	0.400 FJ	NS	NS
MAFB-235	D	Carbon Tetrachloride	NS	0.300 FJ	NS	NS
		Tetrachloroethene	NS	1.20 J	NS	NS
		Trichloroethene	NS	0.800 J	NS	NS
MAFB-240	D	Carbon Tetrachloride	NS	**1.40**	NS	NS
		Tetrachloroethene	NS	**8.30**	NS	NS
		Trichloroethene	NS	4.90	NS	NS
MAFB-242	D	1,1-Dichloroethene	NS	0.200 F	NS	NS
		Carbon Tetrachloride	NS	**1.40**	NS	NS
		cis-1,2-Dichloroethene	NS	0.500 F	NS	NS
		Tetrachloroethene	NS	**24**	NS	NS
		Trichloroethene	NS	**11**	NS	NS
MAFB-243	D	Carbon Tetrachloride	NS	**0.700**	NS	NS
		Tetrachloroethene	NS	3.70	NS	NS
		Trichloroethene	NS	1.30	NS	NS
MAFB-246	WT/Bu	Carbon Tetrachloride	NS	**1.10 J**	NS	NS
		Trichloroethene	NS	0.200 FJ	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (μg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

MAFB-247	WT/B	Carbon Tetrachloride	NS	**0.900**	NS	NS
		cis-1,2-Dichloroethene	NS	0.500	NS	NS
		Trichloroethene	NS	5	NS	NS
MAFB-248	WT/B	1,1-Dichloroethene	NS	0.600	NS	NS
		Carbon Tetrachloride	NS	**0.600**	NS	NS
		cis-1,2-Dichloroethene	NS	1.80	NS	NS
		Trichloroethene	NS	**11**	NS	NS
MAFB-249	B	Carbon Tetrachloride	NS	0.500 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.500	NS	NS
		Tetrachloroethene	NS	0.700	NS	NS
		Trichloroethene	NS	**11**	NS	NS
MAFB-250	D	Carbon Tetrachloride	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	0.400 F	NS	NS
		Trichloroethene	NS	0.800	NS	NS
MAFB-258	WT/Bu	cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Trichloroethene	NS	1.60	NS	NS
MAFB-261	Bu	Carbon Tetrachloride	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	1.20	NS	NS
MAFB-264	WT/Bu	Carbon Tetrachloride	NS	**9.10**	NS	NS
		cis-1,2-Dichloroethene	NS	0.600	NS	NS
		Tetrachloroethene	NS	1.90	NS	NS
		Trichloroethene	NS	**12**	NS	NS
MAFB-265	B	1,1-Dichloroethene	NS	0.200 F	NS	NS
		Carbon Tetrachloride	NS	**0.900**	NS	NS
		cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	2.60	NS	NS
		Trichloroethene	NS	**14**	NS	NS
MAFB-266	B	Carbon Tetrachloride	NS	**1.10**	NS	NS
		cis-1,2-Dichloroethene	NS	0.600	NS	NS
		Tetrachloroethene	NS	4	NS	NS
		Trichloroethene	NS	**9.60**	NS	NS
		Carbon Tetrachloride	NS	1	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (μg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
MAFB-268	B	Tetrachloroethene	NS	3.30	NS	NS
		Trichloroethene	NS	2.70	NS	NS
MAFB-269	B	Tetrachloroethene	NS	0.200 FJ	NS	NS
MAFB-274	B	Tetrachloroethene	NS	1.10	NS	NS
MAFB-282	B	Trichloroethene	NS	4.60	NS	NS
MAFB-291	D	Chloromethane	NS	0.200 FJ	NS	NS
MAFB-296	D	Carbon Tetrachloride	NS	**0.900**	NS	NS
		Tetrachloroethene	NS	**5.80**	NS	NS
MAFB-312	B	Carbon Tetrachloride	NS	**2**	NS	NS
		Tetrachloroethene	NS	3.30	NS	NS
MAFB-313	B	Tetrachloroethene	NS	0.900	NS	NS
MAFB-314	D	Tetrachloroethene	NS	**32 J**	NS	NS
		Trichloroethene	NS	0.300 FJ	NS	NS
MAFB-318	D	Carbon Tetrachloride	NS	**4.40**	NS	NS
		Tetrachloroethene	NS	3.60	NS	NS
MAFB-320	D	Carbon Tetrachloride	NS	**1.50 J**	NS	NS
		Tetrachloroethene	NS	**13 J**	NS	NS
MAFB-324	B	Tetrachloroethene	0.150 F	0.130 F	0.130 F	0.180 F
MAFB-326	D	Carbon Tetrachloride	0.230	<0.0600	0.310	0.140 F
MAFB-327	D	Carbon Tetrachloride	**1.10 M**	<0.0600	0.380	0.170 F
		Tetrachloroethene	<0.0500	0.0750 F	0.0640 F	0.220
MAFB-328	D	Tetrachloroethene	0.160 F	0.110 F	0.110 F	0.160 F
MAFB-330	B	Carbon Tetrachloride	NS	0.400	NS	NS
		cis-1,2-Dichloroethene	NS	0.170 F	NS	NS
		Tetrachloroethene	NS	0.300	NS	NS
		Trichloroethene	NS	0.330	NS	NS
MAFB-332	D	Carbon Tetrachloride	NS	**1.40**	NS	NS
		Tetrachloroethene	NS	**7.90**	NS	NS
MAFB-339	WT/B	Tetrachloroethene	NS	0.400 F	NS	NS
		Trichloroethene	NS	2.20	NS	NS
MAFB-340	WT/B	Tetrachloroethene	NS	0.400 FJ	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (μg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		Trichloroethene	NS	0.200 FJ	NS	NS
MAFB-341	WT/B	Tetrachloroethene	NS	NS	NS	0.500 F
		Trichloroethene	NS	NS	NS	0.300 BF
MAFB-346Bd	Bd	Carbon Tetrachloride	NS	**1.20**	NS	NS
		Tetrachloroethene	NS	0.400 F	NS	NS
		Trichloroethene	NS	0.300 F	NS	NS
MAFB-346Bs	Bs	Carbon Tetrachloride	NS	**1.90**	NS	NS
		Tetrachloroethene	NS	2.60	NS	NS
MAFB-357D	D	Tetrachloroethene	NS	1	NS	NS
		Trichloroethene	NS	0.600	NS	NS
MAFB-357Dd	Dd	Tetrachloroethene	NS	0.200 F	NS	NS
		Trichloroethene	NS	0.800	NS	NS
MAFB-357Ds	Ds	Carbon Tetrachloride	NS	0.300 FJ	NS	NS
		Trichloroethene	NS	0.700	NS	NS
MAFB-358D	D	Tetrachloroethene	NS	4 J	NS	NS
MAFB-359	WT/Bu	Tetrachloroethene	NS	0.300 F	NS	NS
		Trichloroethene	NS	0.700	NS	NS
MAFB-361	B	Tetrachloroethene	NS	0.600 J	NS	NS
		Trichloroethene	NS	0.400 FJ	NS	NS
MAFB-362	B	Tetrachloroethene	NS	0.700	NS	NS
		Trichloroethene	NS	0.300 F	NS	NS
MAFB-363	B	Tetrachloroethene	NS	0.900	NS	NS
MAFB-364B	B	Tetrachloroethene	NS	**6.40**	NS	NS
		Trichloroethene	NS	0.800	NS	NS
MAFB-365B	B	Tetrachloroethene	NS	4.30	NS	NS
		Trichloroethene	NS	0.300 F	NS	NS
MAFB-366D	D	Tetrachloroethene	NS	0.300 F	NS	NS
MAFB-368B	B	Carbon Tetrachloride	NS	**0.900**	NS	NS
		Tetrachloroethene	NS	1.30	NS	NS
MAFB-368D	D	Carbon Tetrachloride	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	3.20	NS	NS
MAFB-375	D	Chloromethane	NS	0.200 FJ	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		Tetrachloroethene	NS	0.200 FJ	NS	NS
MAFB-376	D	Carbon Tetrachloride	NS	0.200 M	NS	NS
		Tetrachloroethene	NS	2.80 M	NS	NS
MAFB-377	D	Carbon Tetrachloride	NS	**0.800**	NS	NS
		Tetrachloroethene	NS	**5.20**	NS	NS
		Trichloroethene	NS	2.60	NS	NS
MAFB-378B	B	Trichloroethene	<0.100	<0.100	<0.100	0.200 BF
MAFB-379D	D	Carbon Tetrachloride	NS	0.300 FJ	NS	NS
		Tetrachloroethene	NS	2 J	NS	NS
MAFB-380B	B	Chloromethane	NS	0.300 FJ	NS	NS
		Tetrachloroethene	NS	0.300 FJ	NS	NS
MAFB-381B	B	Carbon Tetrachloride	NS	**0.600**	NS	NS
		Tetrachloroethene	NS	4.70	NS	NS
MAFB-382B	B	cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
MAFB-384B	WT/B	Tetrachloroethene	NS	0.500 J	NS	NS
MAFB-384B	WT/B	Trichloroethene	NS	0.200 FJ	NS	NS
MAFB-404	WT/B	Chloromethane	NS	0.200 FJ	NS	NS
		Trichloroethene	NS	0.700 J	NS	NS
MAFB-405	WT/B	Carbon Tetrachloride	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	1.80	NS	NS
		Trichloroethene	NS	**12**	NS	NS
MAFB-407	WT/Bu	Tetrachloroethene	NS	0.400 FJ	NS	NS
MAFB-410	WT/A	Carbon Tetrachloride	NS	0.200 FJ	NS	NS
		Tetrachloroethene	NS	0.300 FJ	NS	NS
MAFB-414	WT/A	Carbon Tetrachloride	NS	0.400 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	1.20	NS	NS
		Trichloroethene	NS	**12**	NS	NS
MAFB-417	WT/B	Carbon Tetrachloride	NS	**0.800**	NS	NS
		cis-1,2-Dichloroethene	NS	4.10	NS	NS
		Tetrachloroethene	NS	4.10	NS	NS
		Trichloroethene	NS	**10**	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

MAFB-418	WT/A	1,1-Dichloroethene	NS	5.60	NS	NS
		Carbon Tetrachloride	NS	**3.70**	NS	NS
		cis-1,2-Dichloroethene	NS	0.700	NS	NS
		Tetrachloroethene	NS	1.90	NS	NS
		Trichloroethene	NS	**31**	NS	NS
MAFB-419	WT/B	Diesel	NS	70 J	NS	NS
MAFB-420	WT/A	1,1-Dichloroethene	NS	2	NS	NS
		Carbon Tetrachloride	NS	**1.10**	NS	NS
		cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	**19**	NS	NS
		Trichloroethene	NS	**55**	NS	NS
MAFB-422	WT/Bu	cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
		Trichloroethene	NS	1.20	NS	NS
MAFB-423B	B	cis-1,2-Dichloroethene	NS	0.800	NS	NS
		Trichloroethene	NS	4.60	NS	NS
MAFB-425	WT/A	cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	0.500	NS	NS
		Trichloroethene	NS	1.60	NS	NS
MAFB-426	B	Carbon Tetrachloride	NS	0.400 F	NS	NS
MAFB-429Bd	Bd	1,1-Dichloroethene	NS	0.500 F	NS	NS
		cis-1,2-Dichloroethene	NS	1.10	NS	NS
		Tetrachloroethene	NS	3.30 J	NS	NS
		Trichloroethene	NS	**22**	NS	NS
MAFB-429Bs	Bs	cis-1,2-Dichloroethene	NS	0.600	NS	NS
		Tetrachloroethene	NS	2.50	NS	NS
		Trichloroethene	NS	**13**	NS	NS
MAFB-430	LMT	Carbon Tetrachloride	NS	0.500 FJ	NS	NS
		Tetrachloroethene	NS	2.80 J	NS	NS
MAFB-431Bd	Bd	cis-1,2-Dichloroethene	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	2.20	NS	NS
		Trichloroethene	NS	**5.30**	NS	NS
MAFB-434Bd	Bd	Trichloroethene	NS	1.80	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

MAFB-435	Dd	Carbon Tetrachloride	NS	**1.30 J**	NS	NS
		Tetrachloroethene	NS	**6.70 J**	NS	NS
MAFB-436	WT/A	Chloromethane	NS	0.300 FJ	NS	NS
		Tetrachloroethene	NS	2.80	NS	NS
		Trichloroethene	NS	1.20	NS	NS
MAFB-437Dd	Dd	Chloromethane	NS	0.200 FJ	NS	NS
MAFB-437Ds	Ds	Carbon Tetrachloride	NS	0.200 FJ	NS	NS
		Chloromethane	NS	0.200 FJ	NS	NS
		Tetrachloroethene	NS	0.700 J	NS	NS
MAFB-439	WT/A	Carbon Tetrachloride	NS	**7.20**	NS	NS
		Diesel	NS	23 F	NS	NS
		Lead	NS	0.900 BF	NS	NS
		Tetrachloroethene	NS	**55**	NS	NS
MAFB-449Bs	Bs	Tetrachloroethene	NS	0.300 F	NS	NS
		Trichloroethene	NS	0.800	NS	NS
MAFB-451	B	1,1-Dichloroethene	NS	0.400 F	NS	NS
		Carbon Tetrachloride	NS	0.400 F	NS	NS
		cis-1,2-Dichloroethene	NS	1	NS	NS
		Tetrachloroethene	NS	2.90	NS	NS
		Trichloroethene	NS	**16**	NS	NS
MAFB-452B	B	1,1-Dichloroethene	NS	0.600	NS	NS
		Carbon Tetrachloride	NS	0.300 F	NS	NS
		cis-1,2-Dichloroethene	NS	1.10	NS	NS
		Tetrachloroethene	NS	**8.30**	NS	NS
		Trichloroethene	NS	**37**	NS	NS
MAFB-452Bu	WT/Bu	cis-1,2-Dichloroethene	NS	1	NS	NS
		Tetrachloroethene	NS	1	NS	NS
		Trichloroethene	NS	**8.40**	NS	NS
MAFB-457Bs	Bs	cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	0.900	NS	NS
		Trichloroethene	NS	**6.40**	NS	NS
MAFB-458Bd	Bd	cis-1,2-Dichloroethene	NS	0.200 F	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		Trichloroethene	NS	2.80	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Trichloroethene	NS	0.900	NS	NS
MAFB-460Bd	Bd	Trichloroethene	0.600 J	0.800	1.40	1.50
MAFB-460Bs	Bs	cis-1,2-Dichloroethene	<0.100	<0.100	<0.100	0.200 BF
		Tetrachloroethene	0.100 FJ	<0.200	0.300 F	0.300 F
		Trichloroethene	1.40 J	1.30	1.60	1.90
		Trichloroethene	0.200 F	0.200 F	0.200 F	0.300 FJ
MAFB-463D	D	Carbon Tetrachloride	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	**16**	NS	NS
		Trichloroethene	NS	0.400 F	NS	NS
MAFB-463Dd	Dd	Chloromethane	NS	0.300 FJ	NS	NS
MBS 19EW01	B	Tetrachloroethene	NS	0.500	NS	NS
MBS 19MW01	Bu	Tetrachloroethene	NS	1.40 J	NS	NS
MBS 39ABuB	WT/B	Tetrachloroethene	NS	4.70	NS	NS
MBS 39EW02	B	Tetrachloroethene	NS	0.500	NS	NS
MBS 39MW03	Bu	Tetrachloroethene	NS	1.50	NS	NS
MBS EW-10B	B	Carbon Tetrachloride	NS	**0.700**	NS	NS
		Tetrachloroethene	NS	**9.90**	NS	NS
		Trichloroethene	NS	0.400 F	NS	NS
MBS EW-11B	B	Carbon Tetrachloride	NS	**1.30**	NS	NS
		Tetrachloroethene	NS	2.20	NS	NS
MBS EW-12AB	WT/B	Tetrachloroethene	NS	0.900	NS	NS
MBS EW-12B	B	Carbon Tetrachloride	NS	0.400 F	NS	NS
MBS EW-13BuB	Bu	1,1-Dichloroethene	NS	0.300 M	NS	NS
		cis-1,2-Dichloroethene	NS	0.500 F	NS	NS
		Tetrachloroethene	NS	1.80	NS	NS
		Trichloroethene	NS	**8.10 M**	NS	NS
MBS EW1ABu	WT/Bu	1,1-Dichloroethene	NS	0.700	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	**7.20**	NS	NS
		Trichloroethene	NS	**23**	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

MBS EW-1B	B	Tetrachloroethene	NS	3.40	NS	NS
		Trichloroethene	NS	0.500	NS	NS
MBS EW-1Bu	WT/Bu	cis-1,2-Dichloroethene	NS	0.600	NS	NS
		Tetrachloroethene	NS	0.400 F	NS	NS
		Trichloroethene	NS	1.10	NS	NS
MBS EW-1D	D	Carbon Tetrachloride	NS	**0.700**	NS	NS
		Tetrachloroethene	NS	**32**	NS	NS
		Trichloroethene	NS	0.300 F	NS	NS
MBS EW2ABu	WT/Bu	1,1-Dichloroethene	NS	1	NS	NS
		Carbon Tetrachloride	NS	**1.10**	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	**5.40**	NS	NS
		Trichloroethene	NS	**14**	NS	NS
MBS EW-2AR	WT/A	1,1-Dichloroethene	NS	0.500 F	NS	NS
		Carbon Tetrachloride	NS	**3.40**	NS	NS
		cis-1,2-Dichloroethene	NS	0.400 F	NS	NS
		Tetrachloroethene	NS	4.20	NS	NS
		Trichloroethene	NS	**6.80**	NS	NS
MBS EW-2B	B	Carbon Tetrachloride	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	**18**	NS	NS
		Trichloroethene	NS	3.70	NS	NS
MBS EW-2D	D	Carbon Tetrachloride	NS	**1.90**	NS	NS
		Tetrachloroethene	NS	**28**	NS	NS
		Trichloroethene	NS	2.20	NS	NS
MBS EW-3B	B	Carbon Tetrachloride	NS	0.500	NS	NS
		Tetrachloroethene	NS	**5.90**	NS	NS
		Trichloroethene	NS	3.40	NS	NS
MBS EW-3D	D	Carbon Tetrachloride	NS	**1.50 J**	NS	NS
		Tetrachloroethene	NS	**56 J**	NS	NS
		Trichloroethene	NS	1.80 J	NS	NS
MBS EW4ABu	WT/Bu	1,1-Dichloroethene	NS	1.40	NS	NS
		Carbon Tetrachloride	NS	**6.70**	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		cis-1,2-Dichloroethene	NS	0.500	NS	NS
		Tetrachloroethene	NS	4.60	NS	NS
		Trichloroethene	NS	**14**	NS	NS
MBS EW-4B	B	Tetrachloroethene	NS	3	NS	NS
		Trichloroethene	NS	0.200 F	NS	NS
MBS EW-4Bu	WT/Bu	1,1-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	3.90	NS	NS
		Trichloroethene	NS	**9.90**	NS	NS
MBS EW-4D	D	Carbon Tetrachloride	NS	0.300 F	NS	NS
		Tetrachloroethene	NS	**26**	NS	NS
		Trichloroethene	NS	0.600	NS	NS
MBS EW5ABu	WT/Bu	1,1-Dichloroethene	NS	2.60	NS	NS
		Carbon Tetrachloride	NS	**12**	NS	NS
		cis-1,2-Dichloroethene	NS	0.700	NS	NS
		Tetrachloroethene	NS	**9.40**	NS	NS
		Trichloroethene	NS	**37**	NS	NS
MBS EW-5B	B	Carbon Tetrachloride	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	3.80	NS	NS
MBS EW-5D	D	Carbon Tetrachloride	NS	0.500 M	NS	NS
		Tetrachloroethene	NS	4.50	NS	NS
MBS EW6ABu	WT/A/Bu	Trichloroethene	NS	0.400 F	NS	NS
MBS EW-6B	B	Tetrachloroethene	NS	1.50	NS	NS
		Trichloroethene	NS	0.200 F	NS	NS
MBS EW-6D	D	Carbon Tetrachloride	NS	**0.800**	NS	NS
		Tetrachloroethene	NS	3	NS	NS
MBS EW7ABu	WT/Bu	Tetrachloroethene	NS	1.30	NS	NS
		Trichloroethene	NS	0.200 F	NS	NS
MBS EW-7B	B	Tetrachloroethene	NS	2.50	NS	NS
		Trichloroethene	NS	0.200 F	NS	NS
MBS EW-8B	B	Tetrachloroethene	NS	1.30	NS	NS
MBS EW-9B	B	1,1-Dichloroethene	NS	0.200 F	NS	NS
		cis-1,2-Dichloroethene	NS	0.500	NS	NS

Table 6-1
2013 ANALYTICAL DETECTION SUMMARY
MAIN BASE/SAC AREA PLUME COCs
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Contaminant of Concern	Cleanup Level (µg/L)
1,1-Dichloroethene	6.0
1,2-Dichloroethane	0.5
Benzene	1.0
Carbon Tetrachloride	0.5
Chloromethane	3.0
Diesel	100.0
Lead	15.0
Tetrachloroethene	5.0
Total Petroleum Hydrocarbons Gasoline	50.0
Xylenes	17.0
Trichloroethene	5.0
cis-1,2-Dichloroethene	6.0

		Tetrachloroethene	NS	1.80	NS	NS
		Trichloroethene	NS	3.70	NS	NS
MBS PZ-13	Dd	Tetrachloroethene	NS	1.40	NS	NS
MBS PZ-38	B	Tetrachloroethene	NS	2.20	NS	NS
		Trichloroethene	NS	0.600	NS	NS
MBS PZ-39	B	Tetrachloroethene	NS	2.30	NS	NS
MBS PZ-42D	B	Tetrachloroethene	NS	3.90	NS	NS
MBS PZ-42S	B	Tetrachloroethene	NS	2.30	NS	NS
MBS PZ-44	B	Trichloroethene	NS	0.500	NS	NS
MBS PZ-50S	Dd	Carbon Tetrachloride	NS	0.500	NS	NS
		Tetrachloroethene	NS	**72**	NS	NS
		Trichloroethene	NS	0.200 F	NS	NS
MBS PZ-51	D	Carbon Tetrachloride	NS	1	NS	NS
		cis-1,2-Dichloroethene	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	**86**	NS	NS
		Trichloroethene	NS	**7.40**	NS	NS
MBS PZ-52	D	Tetrachloroethene	NS	2.20	NS	NS
MBS PZ-54	D	Carbon Tetrachloride	NS	0.200 F	NS	NS
		Tetrachloroethene	NS	**8**	NS	NS
MBS PZ-55B	B	Carbon Tetrachloride	NS	1.10 J	NS	NS
		Tetrachloroethene	NS	3.40 J	NS	NS
		Trichloroethene	NS	**5.70 J**	NS	NS
MBS PZ-55Bu	Bu	1,1-Dichloroethene	NS	0.200 F	NS	NS
		Carbon Tetrachloride	NS	**0.600**	NS	NS
		cis-1,2-Dichloroethene	NS	1	NS	NS
		Tetrachloroethene	NS	**7.60**	NS	NS
		Trichloroethene	NS	**17**	NS	NS

TABLE 6-2

2013 Operation Rates and Volatile Organic COC Mass Removed by Main Base/SAC Area Plume Treatment System and Extraction Wells
Former Mather Air Force Base
Sacramento County, California

Well	HSU	Set Point Flow Rate	Quarterly Avg. Flow Rate (gpm)				Volatile Organic COC Concentration (μg/L)				Volatile Organic COCs - Yearly Mass Removed (lbs)
			1Q13	2Q13	3Q13	4Q13	1Q13	2Q13	3Q13	4Q13	
Main Base/SAC Area Plume Treatment Plant Influent (MBS PTI)	-	-	1513.3	1499.0	1445.5	1476.2	12.3	11.0	11.1	9.9	79.8
MBS IW-501	LMT	250	197.3	301.2	266.7	271.8	N/A	N/A	N/A	N/A	N/A
MBS IW-502	LMT	280	295.4	305.9	263.7	260.6	N/A	N/A	N/A	N/A	N/A
MBS IW-503	LMT	480	395.5	378.7	333.0	333.6	N/A	N/A	N/A	N/A	N/A
MBS IW-504	LMT	40	27.2	31.6	26.7	25.1	N/A	N/A	N/A	N/A	N/A
MBS EW-2AR	WT/A	6	9.3	10.0	9.7	9.7	NS	15.0	NS	NS	0.64
MBS EW-1ABu	WT/Bu	8	12.8	14.0	11.8	11.2	NS	30.9	NS	NS	1.69
MBS EW-2ABu	WT/Bu	13	17.4	19.2	18.3	17.7	NS	21.5	NS	NS	1.71
MBS EW-4ABu	WT/Bu	10	8.4	11.2	9.3	9.5	NS	28.4	NS	NS	1.20
MBS EW-5ABu	WT/Bu	6	11.7	9.2	10.7	9.4	NS	51.8	NS	NS	2.33
MBS EW-7ABu*	WT/Bu	40	0.0	24.4	40.1	33.3	NS	1.3	NS	NS	0.14
39EW-ABuB	WT/B	35	14.5	15.0	14.2	13.6	NS	4.7	NS	NS	0.30
MBS EW-1B	B	80	76.3	80.3	74.0	76.8	NS	3.9	NS	NS	1.31
MBS EW-2B	B	100	97.4	95.2	90.7	92.0	NS	21.7	NS	NS	8.93
MBS EW-3B	B	70	93.1	99.4	100.4	102.2	NS	9.8	NS	NS	4.25
MBS EW-4B	B	50	30.4	51.4	46.8	45.5	NS	3.0	NS	NS	0.57
MBS EW-5B	B	48	47.6	46.5	44.9	46.1	NS	3.8	NS	NS	0.77
MBS EW-6B	B	60	50.9	49.1	50.9	51.3	NS	2.1	NS	NS	0.47
MBS EW-7B	B	40	28.9	30.3	29.2	29.4	NS	2.5	NS	NS	0.32

TABLE 6-2 (Continued)

Well	HSU	Set Point Flow Rate	Quarterly Avg. Flow Rate (gpm)					Volatile Organic COC Concentration (µg/L)				Volatile Organic COCs - Yearly Mass Removed (lbs)
			1Q13	2Q13	3Q13	4Q13		1Q13	2Q13	3Q13	4Q13	
MBS EW-9B	B	90	81.7	78.4	78.4	80.6		NS	6.0	NS	NS	2.10
MBS EW-10B	B	100	78.7	76.4	72.9	75.5		NS	10.6	NS	NS	3.53
MBS EW-11B	B	78	77.2	38.2	39.3	60.9		NS	3.5	NS	NS	0.83
MBS EW-12B	B	150	158.0	170.5	163.2	167.0		NS	0.0*	NS	NS	0.00
MBS EW-13BuB	Bu/B	125	130.7	120.3	112.6	123.2		NS	9.9	NS	NS	5.28
MBS EW-1Bu	WT/Bu	5	12.4	13.3	0.1	8.2		NS	1.7	NS	NS	0.06
MBS EW-4Bu	WT/Bu	52	45.7	46.3	43.4	29.3		NS	28.4	NS	NS	5.13
MBS EW-1D	D	120	83.8	74.2	71.7	70.2		NS	32.7	NS	NS	10.75
MBS EW-2D	D	50	51.0	49.7	54.5	62.1		NS	32.1	NS	NS	7.65
MBS EW-3D	D	42	48.0	45.5	39.2	39.6		NS	59.3	NS	NS	11.20
MBS EW-4D	D	52	47.4	45.2	41.0	41.9		NS	26.6	NS	NS	5.12
MBS EW-5D	D	100	99.5	93.6	92.0	95.2		NS	5.0	NS	NS	2.08
MBS EW-6D	D	100	100.5	92.2	86.2	74.8		NS	3.8	NS	NS	1.47

Notes:

* MBS EW-7ABu did not operate in 1Q13 and was restared in 2Q13.

** The sample collected from MBS EW-12B contained VOCs below reporting limits.

TABLE 6-3

2013 Main Base/SAC Area and Morrison Creek Discharge Monitoring
Former Mather Air Force Base
Sacramento County, California

Date Sampled	Sample Location	Specific Conductivity (µmhos/cm)	pH (pH units)	Temperature (Degrees Celsius)	Total VOCs Concentration (µg/L)
01/09/13	MC-R1	59	8.68	11.9	ND
01/09/13	MC-R2	99	8.47	11.8	ND
01/09/13	MBS Effluent	252	8.03	17.1	ND
04/04/13	MC-R1	96	7.57	17.5	ND
04/04/13	MC-R2	122	6.99	19.0	ND
04/04/13	MBS Effluent	240	7.55	18.2	ND
07/10/13	MC-R1	206	7.28	26.3	ND
07/10/13	MC-R2	164	8.02	26.1	ND
07/10/13	MBS Effluent	324	8.00	22.9	ND
10/02/13	MC-R1	232	6.91	18.5	ND
10/02/13	MC-R2	152	7.83	21.9	ND
10/02/13	MBS Effluent	294	7.50	19.3	ND

Notes:

ND = no contaminants detected

MBS = Main Base/SAC Area

MC-R1 = Morrison Creek upgradient sampling location

MC-R2 = Morrison Creek downgradient sampling location

µg/L = micrograms per liter

µmhos/cm = micromhos per centimeter

Table 7-1
2013 ANALYTICAL DETECTION SUMMARY
OFF-BASE MONITORING PROGRAM
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Plume	Analyte	1Q13	2Q13	3Q13	4Q13
MAFB-322	B	MBP	Chloroform	0.170 F	0.190 F	0.180 F	0.150 F
MAFB-323	B	MBP	Chloroform	0.190 F	0.210 F	0.190 F	0.180 F
MAFB-324	B	MBP	Bromodichloromethane	0.0580 F	<0.0200	0.110 F	0.110 F
			Chloroform	0.340 F	0.320 F	0.320 F	0.320 F
			Tetrachloroethene	0.150 F	0.130 F	0.130 F	0.180 F
MAFB-326	D	MBP	Carbon Tetrachloride	0.230	<0.0600	0.310	0.140 F
			Ethylbenzene	<0.0300	<0.0300	<0.0300	0.0450 F
MAFB-327	D	MBP	Carbon Tetrachloride	1.10 M	<0.0600	0.380	0.170 F
			Tetrachloroethene	<0.0500	0.0750 F	0.0640 F	0.220
MAFB-328	D	MBP	Bromodichloromethane	0.0440 F	<0.0200	0.0940 F	0.100 F
			Chloroform	0.290 F	0.340 F	0.310 F	0.290 F
			Tetrachloroethene	0.160 F	0.110 F	0.110 F	0.160 F
MAFB-330	B	MBP	Carbon Tetrachloride	NS	0.400	NS	NS
			Chloroform	NS	0.110 F	NS	NS
			cis-1,2-Dichloroethene	NS	0.170 F	NS	NS
			Tetrachloroethene	NS	0.300	NS	NS
			Trichloroethene	NS	0.330	NS	NS
MAFB-336	D	MBP	All Analytes	NS	ND	NS	NS
MAFB-337	Dd	MBP	All Analytes	ND	ND	ND	ND
MAFB-338	Dd	MBP	All Analytes	ND	ND	ND	ND
MAFB-349	LMT	MBP	All Analytes	NS	ND	NS	NS
MAFB-378B	B	MBP	Chloroform	1.20	1.90	2.90	1.90
			Trichloroethene	<0.100	<0.100	<0.100	0.200 BF
MAFB-378D	D	MBP	All Analytes	ND	ND	ND	ND
MAFB-397	Dd	MBP	All Analytes	ND	ND	ND	ND
OFB-03		MBP	All Analytes	NS	ND	NS	NS
OFB-04		MBP	Carbon Tetrachloride	0.190 F	0.170 F	<0.0600	0.140 F
			Chloromethane	<0.0500	<0.0500	<0.0500	<0.0500
OFB-04M		MBP	Carbon Tetrachloride	<0.0600	<0.0600	<0.0600	<0.0600
			Chloroform	<0.0400	<0.0400	<0.0400	<0.0400
OFB-06		MBP	All Analytes	NS	ND	NS	NS
OFB-07		MBP	Tetrachloroethene	NS	0.200 F	NS	NS
			Trichloroethene	NS	1.20	NS	NS
OFB-12		MBP	Tetrachloroethene	NS	0.200 F	NS	NS
			Trichloroethene	NS	1.30	NS	NS
OFB-17		MBP	All Analytes	NS	ND	NS	NS
OFB-24		MBP	Chloroform	NS	0.300 FJ	NS	NS
OFB-27		MBP	Chloroform	0.0480 F	0.0660 F	<0.0400	0.0620 F
OFB-31		MBP	Chloroform	NS	NS	NS	0.420 F
			Tetrachloroethene	NS	NS	NS	0.420
			Trichloroethene	NS	NS	NS	0.120 F
OFB-32		MBP	All Analytes	ND	ND	ND	ND
OFB-39		SWL	All Analytes	NS	ND	NS	NS
OFB-40		Site 7	All Analytes	NS	ND	NS	NS
OFB-43		Site 7	All Analytes	NS	ND	NS	NS
OFB-47		Site 7	All Analytes	NS	ND	NS	NS
OFB-48		Site 7	All Analytes	NS	ND	NS	NS

Table 7-1
2013 ANALYTICAL DETECTION SUMMARY
OFF-BASE MONITORING PROGRAM
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

Well ID	Unit	Plume	Analyte	1Q13	2Q13	3Q13	4Q13
OFB-49		MBP	All Analytes	NS	ND	ND	NS
OFB-51		MBP	Carbon Tetrachloride	0.600	0.570	0.450	<0.0600
			Chloroform	0.0790 F	0.0870 F	<0.0400	<0.0400
OFB-52		MBP	Carbon Tetrachloride	0.340	0.310	0.230	0.280
			Chloroform	<0.0400	0.0560 F	<0.0400	<0.0400
			Tetrachloroethene	0.0780 F	<0.0500	<0.0500	<0.0500
OFB-53		Site 7	All Analytes	NS	ND	NS	NS
OFB-54		MBP	1,1-Dichloroethene	0.250 FJ	0.230 F	<0.0400	0.310 F
			Chloroform	0.650	0.350 F	0.650	0.290 F
OFB-55		MBP	Chloroform	0.170 F	0.130 F	<0.0400	0.150 F
OFB-56		MBP	All Analytes	ND	ND	ND	ND
OFB-57		SWL	All Analytes	NS	ND	NS	NS
OFB-67		SWL	All Analytes	NS	ND	NS	NS
OFB-69		SWL	All Analytes	NS	ND	NS	NS
OFB-71		SWL	All Analytes	NS	ND	NS	NS
OFB-72		SWL	Tetrachloroethene	<0.100	0.200 F	0.200 F	0.200 F
			Trichloroethene	0.700 J	1.10	1.40	1.60
OFB-73		SWL	All Analytes	NS	ND	NS	NS
OFB-74		SWL	All Analytes	NS	ND	NS	NS
OFB-75		SWL	All Analytes	NS	ND	NS	NS
OFB-76		SWL	All Analytes	NS	ND	NS	NS
OFB-77		SWL	All Analytes	NS	ND	NS	NS
OFB-78		SWL	All Analytes	NS	ND	NS	NS
OFB-79		SWL	All Analytes	ND	ND	ND	ND
OFB-80		SWL	All Analytes	ND	ND	ND	ND
OFB-81		SWL	All Analytes	NS	ND	NS	NS
OFB-82		SWL	All Analytes	NS	ND	NS	NS
OFB-83		SWL	All Analytes	NS	ND	NS	NS
OFB-84		SWL	All Analytes	NS	ND	NS	NS
OFB-85		SWL	All Analytes	NS	ND	NS	NS
OFB-86		SWL	All Analytes	NS	ND	NS	NS

Notes:
F = estimated concentration between detection limit and reporting limit
M = matrix interference
MBP = Main Base/SAC Area Plume
ND= not detected
NS = not sampled
SWL = Southwest Lobe of the MBP

Table 8-1. Summary of Completeness by Method, 2013, Mather AFB						
Method	**Number of Samples[a]**	**Number of Analytes**	**Total Number of Results**	**Number of Estimated Results**	**Number of Rejected Results**	**Percent Completeness**
General Chemistry						
A2320	36	4	144	0	0	100
A2540C	35	1	35	18	0	100
E130.2	32	1	32	0	0	100
E160.2	14	1	14	4	0	100
E300.0	108	36 (chloride and sulfate) 25 (nitrite) 11 (fluoride)	108	9	0	100
E376.2	12	1	12	8	0	100
Total Petroleum Hydrocarbons						
M8015D	24	1	24	23	0	100
M8015V	30	1	30	20	0	100
Metals						
SW6010B	43	26 (15 metals) 16 (7 metals) 1 (nickel only)	503	136	0	100
SW6020 (filtered and dissolved)	69	1 (15 metals) 4 (7 metals) 22 (lead only) 3 (nickel only) 14 (selenium only) 25 (thallium only)	107	31	0	100
SW7196A	13	1	13	0	0	
SW7470A	26	1	26	7	0	100
Volatile Organic Compounds						
E524.2	115	59	6,785	217	0	100
SW8260B	419	370 (11 Analytes) 49 (35 Analytes)	5,785	435	0	100
Pesticides and PCBs						
SW8081A	4	20	80	6	0	100
SW8082	4	7	28	0	0	100
Semivolatile Organic Compounds						
SW8270C	4	17	68	0	0	100

[a] Includes only normal samples

Table 8-2. Qualified Results for Mather 2013

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
Method A2540C							
MBS PTE SW-0102-NS	1/9/2013	Total Dissolved Solids	160	10	MG/L	J	3A,3C
MBS PTI-0102-NS	1/9/2013	Total Dissolved Solids	140	10	MG/L	J	3A,3C
7-PTE-0102-NS	1/9/2013	Total Dissolved Solids	200	10	MG/L	J	3A,3C
7-PTI-0102-NS	1/9/2013	Total Dissolved Solids	210	10	MG/L	J	3A,3C
MAFB-465-NS	2/28/2013	Total Dissolved Solids	310	10	MG/L	J	3A
MAFB-132-NS	6/5/2013	Total Dissolved Solids	260	10	MG/L	J	3A
MAFB-136-NS	6/5/2013	Total Dissolved Solids	180	10	MG/L	J	3A
MAFB-133-NS	6/5/2013	Total Dissolved Solids	120	10	MG/L	J	3A,3C
MAFB-398-NS	6/5/2013	Total Dissolved Solids	240	10	MG/L	J	3A,3C
MAFB-398C-NS	6/6/2013	Total Dissolved Solids	200	10	MG/L	J	3A,3C
MAFB-399-NS	6/6/2013	Total Dissolved Solids	120	10	MG/L	J	3A,3C
MAFB-400-NS	6/10/2013	Total Dissolved Solids	330	10	MG/L	J	3A,3D
MAFB-288-NS	6/13/2013	Total Dissolved Solids	110	10	MG/L	J	3A,3C
7-EW-1-NS	6/13/2013	Total Dissolved Solids	180	10	MG/L	J	3A,3C
7-EW-2-NS	6/13/2013	Total Dissolved Solids	260	10	MG/L	J	3A,3C
ACW PTE-1001-NS	10/2/2013	Total Dissolved Solids	100	10	MG/L	J	3C
ACW PTI-1001-NS	10/2/2013	Total Dissolved Solids	96	10	MG/L	J	3C
MAFB-132-NS	11/18/2013	Total Dissolved Solids	260	10	MG/L	J	3C
Method E160.2							
MC-R1-0401-NS	4/4/2013	Total Suspended Solids	26	5.0	MG/L	J	3A
MC-R2-0401-NS	4/4/2013	Total Suspended Solids	61	5.0	MG/L	J	3A
MC-R1-0702-NS	7/10/2013	Total Suspended Solids	6.0	5.0	MG/L	J	3A
MC-R1-1001-NS	10/2/2013	Total Suspended Solids	250	5.0	MG/L	J	3A
Method E300.0							
MAFB-465-NS	2/28/2013	Fluoride	0.056	0.100	MG/L	F	6G
MAFB-132-NS	6/5/2013	Fluoride	0.067	0.100	MG/L	F	6G
MAFB-133-NS	6/5/2013	Fluoride	0.092	0.100	MG/L	F	6G
MAFB-398-NS	6/5/2013	Fluoride	0.023	0.100	MG/L	F	6G
MAFB-398C-NS	6/6/2013	Fluoride	0.047	0.100	MG/L	F	6G
MAFB-399-NS	6/6/2013	Fluoride	0.057	0.100	MG/L	F	6G
MAFB-400-NS	6/10/2013	Fluoride	0.021	0.100	MG/L	F	6G
MAFB-465-NS	6/21/2013	Fluoride	0.038	0.100	MG/L	F	6G
MAFB-132-NS	11/18/2013	Fluoride	0.097	0.100	MG/L	F	6G
Method E376.2							
MAFB-465-NS	2/28/2013	Sulfide	0.030	0.040	MG/L	F	6G
MAFB-133-NS	6/5/2013	Sulfide	0.010	0.040	MG/L	F	6G
MAFB-398C-NS	6/6/2013	Sulfide	0.040	0.040	MG/L	F	6G
MAFB-399-NS	6/6/2013	Sulfide	0.020	0.040	MG/L	F	6G
MAFB-400-NS	6/10/2013	Sulfide	0.007	0.040	MG/L	F	6G
MAFB-288-NS	6/13/2013	Sulfide	0.008	0.040	MG/L	F	6G
MAFB-465-NS	6/21/2013	Sulfide	0.040	0.040	MG/L	F	6G
MAFB-132-NS	11/18/2013	Sulfide	0.000	0.040	MG/L	M	2B-
Method E524.2							
JH EFFLUENT-NS	1/29/2013	Chloromethane	0.130	0.500	ug/L	F	6G
JH INFLUENT-NS	1/29/2013	Chloroform	0.063	0.500	ug/L	F	6G
JH MID-GAC-NS	1/29/2013	1,1-Dichloroethane	0.071	0.500	ug/L	F	6G
		Chloroform	0.084	0.500	ug/L	F	6G
		Chloromethane	0.150	0.500	ug/L	F	6G
		cis-1,2-Dichloroethene	0.067	0.500	ug/L	F	6G
MOONBEAM MID-GAC-NS	1/29/2013	Chloroform	0.061	0.500	ug/L	F	6G
MOONBEAM-NS	1/29/2013	Carbon Tetrachloride	0.130	0.200	ug/L	F	6G
		Chloromethane	0.100	0.500	ug/L	F	6G
MAFB-322-NS	2/28/2013	Chloroform	0.170	0.500	ug/L	F	6G
MAFB-323-NS	2/26/2013	Chloroform	0.190	0.500	ug/L	F	6G
MAFB-324-NS	2/28/2013	Bromodichloromethane	0.058	0.500	ug/L	F	6G
		Chloroform	0.340	0.500	ug/L	F	6G
		Tetrachloroethene	0.150	0.200	ug/L	F	6G
MAFB-327-NS	2/26/2013	1,2,3-Trichlorobenzene	0.000	0.500	ug/L	M	2B-

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
		1,2,4-Trichlorobenzene	0.000	0.500	ug/L	M	2B-
		1,2-Dibromo-3-Chloroprop	0.000	2.000	ug/L	M	2B-
		2,2-Dichloropropane	0.000	0.500	ug/L	M	2B-
		Bromodichloromethane	0.000	0.500	ug/L	M	2B-
		Bromoform	0.000	0.500	ug/L	M	2B-
		Carbon Tetrachloride	1.100	0.200	ug/L	M	2B-
		Hexachlorobutadiene	0.000	0.500	ug/L	M	2B-
		Methylene Chloride	0.000	0.500	ug/L	M	2B-
		Naphthalene	0.000	0.500	ug/L	M	2B-
		P-Cymene (p-Isopropyltolu	0.000	0.500	ug/L	M	2B-
		Styrene	0.000	0.500	ug/L	M	2B-
		Trichloroethene	0.000	0.200	ug/L	M	2B-
		trans-1,3-Dichloropropene	0.000	0.500	ug/L	M	2B-
MAFB-328-NS	2/28/2013	Bromodichloromethane	0.044	0.500	ug/L	F	6G
		Chloroform	0.290	0.500	ug/L	F	6G
		Tetrachloroethene	0.160	0.200	ug/L	F	6G
MARS-NS	2/26/2013	Chloroform	0.048	0.500	ug/L	F	6G
JH1-NS	2/26/2013	Chloroform	0.079	0.500	ug/L	F	6G
JH2-NS	2/26/2013	Tetrachloroethene	0.078	0.200	ug/L	F	6G
SOUTH PORT-NS	2/26/2013	1,1-Dichloroethene	0.250	0.500	ug/L	FJ	3D,6G
WESTPORTER-NS	2/26/2013	Chloroform	0.170	0.500	ug/L	F	6G
JH MID-GAC-NS	3/21/2013	cis-1,2-Dichloroethene	0.092	0.500	ug/L	F	6G
MOONBEAM-NS	3/21/2013	Carbon Tetrachloride	0.190	0.200	ug/L	F	6G
JH MID-GAC-NS	4/24/2013	Chloroform	0.120	0.500	ug/L	F	6G
MOONBEAM MID-GAC-NS	4/24/2013	1,1,1,2-Tetrachloroethane	0.000	0.500	ug/L	UJ	4B
		1,1,1-Trichloroethane	0.000	0.500	ug/L	UJ	4B
		1,1,2,2-Tetrachloroethane	0.000	0.500	ug/L	UJ	4B
		1,1,2-Trichloroethane	0.000	0.500	ug/L	UJ	4B
		1,1-Dichloroethane	0.000	0.500	ug/L	UJ	4B
		1,1-Dichloroethene	0.000	0.500	ug/L	UJ	4B
		1,1-Dichloropropene	0.000	0.500	ug/L	UJ	4B
		1,2,3-Trichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,2,3-Trichloropropane	0.000	0.500	ug/L	UJ	4B
		1,2,4-Trichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,2,4-Trimethylbenzene	0.000	0.500	ug/L	UJ	4B
		1,2-Dibromo-3-Chloroprop	0.000	2.000	ug/L	UJ	4B
		1,2-Dibromoethane	0.000	0.500	ug/L	UJ	4B
		1,2-Dichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,2-Dichloroethane	0.000	0.500	ug/L	UJ	4B
		1,2-Dichloropropane	0.000	0.500	ug/L	UJ	4B
		1,3,5-Trimethylbenzene	0.000	0.500	ug/L	UJ	4B
		1,3-Dichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,3-Dichloropropane	0.000	0.500	ug/L	UJ	4B
		1,4-Dichlorobenzene	0.000	0.500	ug/L	UJ	4B
		2,2-Dichloropropane	0.000	0.500	ug/L	UJ	4B
		2-Chlorotoluene	0.000	0.500	ug/L	UJ	4B
		4-Chlorotoluene	0.000	0.500	ug/L	UJ	4B
		Benzene	0.000	0.500	ug/L	UJ	4B
		Bromobenzene	0.000	0.500	ug/L	UJ	4B
		Bromochloromethane	0.000	1.000	ug/L	UJ	4B
		Bromodichloromethane	0.000	0.500	ug/L	UJ	4B
		Bromoform	0.000	0.500	ug/L	UJ	4B
		Bromomethane	0.000	0.500	ug/L	UJ	4B
		Carbon Tetrachloride	0.000	0.200	ug/L	UJ	4B
		Chlorobenzene	0.000	0.500	ug/L	UJ	4B
		Chloroethane	0.000	1.000	ug/L	UJ	4B
		Chloroform	0.000	0.500	ug/L	UJ	4B
		Chloromethane	0.000	0.500	ug/L	UJ	4B
		Dibromochloromethane	0.000	0.500	ug/L	UJ	4B
		Dibromomethane	0.000	0.500	ug/L	UJ	4B

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
		Dichlorodifluoromethane	0.000	0.500	ug/L	UJ	4B
		Ethylbenzene	0.000	0.500	ug/L	UJ	4B
		Hexachlorobutadiene	0.000	0.500	ug/L	UJ	4B
		Isopropylbenzene	0.000	0.500	ug/L	UJ	4B
		Methylene Chloride	0.000	0.500	ug/L	UJ	4B
		Naphthalene	0.000	0.500	ug/L	UJ	4B
		P-Cymene (p-Isopropyltolu	0.000	0.500	ug/L	UJ	4B
		Sec-Butylbenzene	0.000	0.500	ug/L	UJ	4B
		Styrene	0.000	0.500	ug/L	UJ	4B
		Tetrachloroethene	0.000	0.200	ug/L	UJ	4B
		Toluene	0.000	0.500	ug/L	UJ	4B
		Total Xylenes	0.000	0.500	ug/L	UJ	4B
		Trichloroethene	0.000	0.200	ug/L	UJ	4B
		Trichlorofluoromethane	0.000	0.500	ug/L	UJ	4B
		Vinyl Chloride	0.000	0.500	ug/L	UJ	4B
		cis-1,2-Dichloroethene	0.000	0.500	ug/L	UJ	4B
		cis-1,3-Dichloropropene	0.000	0.500	ug/L	UJ	4B
		n-Butylbenzene	0.000	0.500	ug/L	UJ	4B
		n-Propylbenzene	0.000	0.500	ug/L	UJ	4B
		t-Butylbenzene	0.000	0.500	ug/L	UJ	4B
		trans-1,2-Dichloroethene	0.000	0.500	ug/L	UJ	4B
		trans-1,3-Dichloropropene	0.000	0.500	ug/L	UJ	4B
MOONBEAM-NS	4/24/2013	1,1,1,2-Tetrachloroethane	0.000	0.500	ug/L	UJ	4B
		1,1,1-Trichloroethane	0.000	0.500	ug/L	UJ	4B
		1,1,2,2-Tetrachloroethane	0.000	0.500	ug/L	UJ	4B
		1,1,2-Trichloroethane	0.000	0.500	ug/L	UJ	4B
		1,1-Dichloroethane	0.000	0.500	ug/L	UJ	4B
		1,1-Dichloroethene	0.000	0.500	ug/L	UJ	4B
		1,1-Dichloropropene	0.000	0.500	ug/L	UJ	4B
		1,2,3-Trichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,2,3-Trichloropropane	0.000	0.500	ug/L	UJ	4B
		1,2,4-Trichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,2,4-Trimethylbenzene	0.000	0.500	ug/L	UJ	4B
		1,2-Dibromo-3-Chloroprop	0.000	2.000	ug/L	UJ	4B
		1,2-Dibromoethane	0.000	0.500	ug/L	UJ	4B
		1,2-Dichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,2-Dichloroethane	0.000	0.500	ug/L	UJ	4B
		1,2-Dichloropropane	0.000	0.500	ug/L	UJ	4B
		1,3,5-Trimethylbenzene	0.000	0.500	ug/L	UJ	4B
		1,3-Dichlorobenzene	0.000	0.500	ug/L	UJ	4B
		1,3-Dichloropropane	0.000	0.500	ug/L	UJ	4B
		1,4-Dichlorobenzene	0.000	0.500	ug/L	UJ	4B
		2,2-Dichloropropane	0.000	0.500	ug/L	UJ	4B
		2-Chlorotoluene	0.000	0.500	ug/L	UJ	4B
		4-Chlorotoluene	0.000	0.500	ug/L	UJ	4B
		Benzene	0.000	0.500	ug/L	UJ	4B
		Bromobenzene	0.000	0.500	ug/L	UJ	4B
		Bromochloromethane	0.000	1.000	ug/L	UJ	4B
		Bromodichloromethane	0.000	0.500	ug/L	UJ	4B
		Bromoform	0.000	0.500	ug/L	UJ	4B
		Bromomethane	0.000	0.500	ug/L	UJ	4B
		Carbon Tetrachloride	0.120	0.200	ug/L	FJ	4B,6G
		Chlorobenzene	0.000	0.500	ug/L	UJ	4B
		Chloroethane	0.000	1.000	ug/L	UJ	4B
		Chloroform	0.000	0.500	ug/L	UJ	4B
		Chloromethane	0.000	0.500	ug/L	UJ	4B
		Dibromochloromethane	0.000	0.500	ug/L	UJ	4B
		Dibromomethane	0.000	0.500	ug/L	UJ	4B
		Dichlorodifluoromethane	0.000	0.500	ug/L	UJ	4B
		Ethylbenzene	0.000	0.500	ug/L	UJ	4B

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
		Hexachlorobutadiene	0.000	0.500	ug/L	UJ	4B
		Isopropylbenzene	0.000	0.500	ug/L	UJ	4B
		Methylene Chloride	0.000	0.500	ug/L	UJ	4B
		Naphthalene	0.000	0.500	ug/L	UJ	4B
		P-Cymene (p-Isopropyltolu	0.000	0.500	ug/L	UJ	4B
		Sec-Butylbenzene	0.000	0.500	ug/L	UJ	4B
		Styrene	0.000	0.500	ug/L	UJ	4B
		Tetrachloroethene	0.000	0.200	ug/L	UJ	4B
		Toluene	0.000	0.500	ug/L	UJ	4B
		Total Xylenes	0.000	0.500	ug/L	UJ	4B
		Trichloroethene	0.000	0.200	ug/L	UJ	4B
		Trichlorofluoromethane	0.000	0.500	ug/L	UJ	4B
		Vinyl Chloride	0.000	0.500	ug/L	UJ	4B
		cis-1,2-Dichloroethene	0.000	0.500	ug/L	UJ	4B
		cis-1,3-Dichloropropene	0.000	0.500	ug/L	UJ	4B
		n-Butylbenzene	0.000	0.500	ug/L	UJ	4B
		n-Propylbenzene	0.000	0.500	ug/L	UJ	4B
		t-Butylbenzene	0.000	0.500	ug/L	UJ	4B
		trans-1,2-Dichloroethene	0.000	0.500	ug/L	UJ	4B
		trans-1,3-Dichloropropene	0.000	0.500	ug/L	UJ	4B
JH INFLUENT-NS	5/28/2013	Chloroform	0.058	0.500	ug/L	F	6G
JH MID-GAC-NS	5/28/2013	Carbon Tetrachloride	0.062	0.200	ug/L	F	6G
		Chloroform	0.120	0.500	ug/L	F	6G
		cis-1,2-Dichloroethene	0.110	0.500	ug/L	F	6G
MOONBEAM-NS	5/28/2013	Carbon Tetrachloride	0.140	0.200	ug/L	F	6G
MARS-NS	6/26/2013	Chloroform	0.066	0.500	ug/L	F	6G
JH1-NS	6/26/2013	Chloroform	0.087	0.500	ug/L	F	6G
JH2-NS	6/26/2013	Chloroform	0.056	0.500	ug/L	F	6G
SOUTH PORT-NS	6/26/2013	1,1-Dichloroethene	0.230	0.500	ug/L	F	6G
		Chloroform	0.350	0.500	ug/L	F	6G
WESTPORTER-NS	6/26/2013	Chloroform	0.130	0.500	ug/L	F	6G
MAFB-322-NS	6/24/2013	Chloroform	0.190	0.500	ug/L	F	6G
MAFB-323-NS	6/24/2013	Chloroform	0.210	0.500	ug/L	F	6G
MAFB-324-NS	6/24/2013	Chloroform	0.320	0.500	ug/L	F	6G
		Tetrachloroethene	0.130	0.200	ug/L	F	6G
MAFB-327-NS	6/24/2013	Tetrachloroethene	0.075	0.200	ug/L	F	6G
MAFB-328-NS	6/24/2013	Chloroform	0.340	0.500	ug/L	F	6G
		Tetrachloroethene	0.110	0.200	ug/L	F	6G
MAFB-330-NS	6/24/2013	Chloroform	0.110	0.500	ug/L	F	6G
		cis-1,2-Dichloroethene	0.170	0.500	ug/L	F	6G
JH INFLUENT-NS	6/26/2013	Chloroform	0.066	0.500	ug/L	F	6G
JH MID-GAC-NS	6/26/2013	Chloroform	0.130	0.500	ug/L	F	6G
		cis-1,2-Dichloroethene	0.120	0.500	ug/L	F	6G
MOONBEAM-NS	6/26/2013	Carbon Tetrachloride	0.170	0.200	ug/L	F	6G
JH MID-GAC-NS	8/26/2013	Carbon Tetrachloride	0.180	0.200	ug/L	F	6G
MAFB-322-NS	9/10/2013	Chloroform	0.180	0.500	ug/L	F	6G
MAFB-323-NS	9/10/2013	Chloroform	0.190	0.500	ug/L	F	6G
MAFB-324-NS	9/10/2013	Bromodichloromethane	0.110	0.500	ug/L	F	6G
		Chloroform	0.320	0.500	ug/L	F	6G
		Tetrachloroethene	0.130	0.200	ug/L	F	6G
MAFB-327-NS	9/10/2013	Tetrachloroethene	0.064	0.200	ug/L	F	6G
MAFB-328-NS	9/10/2013	Bromodichloromethane	0.094	0.500	ug/L	F	6G
		Chloroform	0.310	0.500	ug/L	F	6G
		Tetrachloroethene	0.110	0.200	ug/L	F	6G
MAFB-338-NS	9/10/2013	2,2-Dichloropropane	0.000	0.500	ug/L	M	2B-
		Naphthalene	0.000	0.500	ug/L	M	2B-
JH INFLUENT-NS	10/30/2013	Chloroform	0.060	0.500	ug/L	F	6G
		Tetrachloroethene	0.057	0.200	ug/L	F	6G
		Trichloroethene	0.041	0.200	ug/L	F	6G
MOONBEAM MID-GAC-NS	10/31/2013	Carbon Tetrachloride	0.083	0.200	ug/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MOONBEAM-NS	10/31/2013	Carbon Tetrachloride	0.150	0.200	ug/L	F	6G
MAFB-322-NS	11/20/2013	Chloroform	0.150	0.500	ug/L	F	6G
MAFB-323-NS	11/19/2013	Chloroform	0.180	0.500	ug/L	F	6G
MAFB-324-NS	11/21/2013	Bromodichloromethane	0.110	0.500	ug/L	F	6G
		Chloroform	0.320	0.500	ug/L	F	6G
		Tetrachloroethene	0.180	0.200	ug/L	F	6G
MAFB-326-NS	11/20/2013	Carbon Tetrachloride	0.140	0.200	ug/L	F	6G
		Ethylbenzene	0.045	0.500	ug/L	F	6G
MAFB-327-NS	11/19/2013	Carbon Tetrachloride	0.170	0.200	ug/L	F	6G
MAFB-328-NS	11/20/2013	Bromodichloromethane	0.100	0.500	ug/L	F	6G
		Chloroform	0.290	0.500	ug/L	F	6G
		Tetrachloroethene	0.160	0.200	ug/L	F	6G
GOULD-NS	11/20/2013	Chloroform	0.420	0.500	ug/L	F	6G
		Trichloroethene	0.120	0.200	ug/L	F	6G
MARS-NS	11/20/2013	Chloroform	0.062	0.500	ug/L	F	6G
WESTPORTER-NS	11/20/2013	Chloroform	0.150	0.500	ug/L	F	6G
SOUTH PORT-NS	11/20/2013	1,1-Dichloroethene	0.310	0.500	ug/L	F	6G
		Chloroform	0.290	0.500	ug/L	F	6G
JH INFLUENT-NS	11/20/2013	Chloroform	0.060	0.500	ug/L	BF	1B,6G
JH MID-GAC-NS	11/20/2013	Carbon Tetrachloride	0.120	0.200	ug/L	F	6G
		Chloroform	0.082	0.500	ug/L	BF	1B,6G
MOONBEAM-NS	11/20/2013	Carbon Tetrachloride	0.140	0.200	ug/L	F	6G
Method M8015D							
MBS PTE SW-0102-NS	1/9/2013	Diesel	21	52	UG/L	BF	1A,6G
MBS PTI-0102-NS	1/9/2013	Diesel	32	50	UG/L	BF	1A,6G
7-PTE-0102-NS	1/9/2013	Diesel	24	50	UG/L	BF	1A,6G
7-PTI-0102-NS	1/9/2013	Diesel	34	50	UG/L	BF	1A,6G
MBS PTI-0401-NS	4/4/2013	Diesel	49	50	UG/L	F	3D,6G
7-PTE-0401-NS	4/4/2013	Diesel	26	51	UG/L	F	6G
7-PTI-0401-NS	4/4/2013	Diesel	26	50	UG/L	F	6G
7-BV-13-NS	6/3/2013	Diesel	45	50	UG/L	F	6G
MAFB-413-NS	6/3/2013	Diesel	47	49	UG/L	F	6G
7-PZ-38P-NS	6/4/2013	Diesel	32	49	UG/L	F	6G
MAFB-419-NS	6/6/2013	Diesel	70	52	UG/L	J	6F
MAFB-439-NS	6/6/2013	Diesel	23	49	UG/L	F	6G
MAFB-149-NS	6/10/2013	Diesel	23	52	UG/L	BF	1A,6G
7-PZ-37P-NS	6/18/2013	Diesel	83	50	UG/L	B	1A
MAFB-284-NS	6/18/2013	Diesel	35	50	UG/L	BF	1A,6G
MBS PTE SW-0702-NS	7/10/2013	Diesel	56	49	UG/L	BJ	1A,6F
MBS PTI-0702-NS	7/10/2013	Diesel	68	50	UG/L	BJ	1A,6F
7-PTE-0702-NS	7/10/2013	Diesel	60	50	UG/L	B	1A,6F
7-PTI-0702-NS	7/10/2013	Diesel	57	49	UG/L	B	1A,6F
MBS PTE SW-1001-NS	10/2/2013	Diesel	24	49	UG/L	BF	1A,6G
MBS PTI-1001-NS	10/2/2013	Diesel	21	50	UG/L	BF	1A,6G
7-PTE-1001-NS	10/2/2013	Diesel	24	50	UG/L	BF	1A,6G
7-PTI-1001-NS	10/2/2013	Diesel	23	50	UG/L	BF	1A,6G
Method M8015V							
MBS PTE SW-0102-NS	1/9/2013	Gasoline	17	50	UG/L	BF	1A,6G
MBS PTI-0102-NS	1/9/2013	Gasoline	19	50	UG/L	BF	1A,6G
7-PTE-0102-NS	1/9/2013	Gasoline	18	50	UG/L	BF	1A,6G
7-PTI-0102-NS	1/9/2013	Gasoline	24	50	UG/L	BF	1A,6G
7-PTE-0401-NS	4/4/2013	Gasoline	14	50	UG/L	BF	1A,6G
7-PTI-0401-NS	4/4/2013	Gasoline	19	50	UG/L	BF	1A,6G
7-BV-13-NS	6/3/2013	Gasoline	14	50	UG/L	BF	1A,6G
MAFB-203-NS	6/7/2013	Gasoline	13	50	UG/L	BF	1A,6G
MAFB-439-NS	6/6/2013	Gasoline	23	50	UG/L	BF	1A,6G
MAFB-149-NS	6/10/2013	Gasoline	13	50	UG/L	F	6G
7-EW-1-NS	6/13/2013	Gasoline	13	50	UG/L	F	6G
7-EW-2-NS	6/13/2013	Gasoline	21	50	UG/L	F	6G
7-PZ-37P-NS	6/18/2013	Gasoline	26	50	UG/L	BF	1A,6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MAFB-284-NS	6/18/2013	Gasoline	18	50	UG/L	BF	1A,6G
MAFB-417-NS	6/27/2013	Gasoline	14	50	UG/L	F	6G
MAFB-314-NS	7/1/2013	Gasoline	22	50	UG/L	F	6G
MBS EW-1D-NS	7/1/2013	Gasoline	21	50	UG/L	F	6G
MBS PTI-0702-NS	7/10/2013	Gasoline	14	50	UG/L	BF	1B,6G
7-PTI-0702-NS	7/10/2013	Gasoline	18	50	UG/L	F	6G
7-PTI-1001-NS	10/2/2013	Gasoline	11	50	UG/L	F	6G
Method SW6010B							
MBS PTE SW-0102-NF	1/9/2013	Chromium	3.80	5.00	UG/L	F	6G
		Manganese	0.43	5.00	UG/L	BF	1A,6G
		Silver	0.00	5.00	UG/L	UJ	2E-
MBS PTI-0102-NF	1/9/2013	Chromium	4.00	5.00	UG/L	F	6G
		Manganese	0.20	5.00	UG/L	BF	1A,6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	7.30	20.00	UG/L	F	6G
7-PTE-0102-NF	1/9/2013	Zinc	7.90	20.00	UG/L	F	6G
7-PTI-0102-NF	1/9/2013	Manganese	0.27	5.00	UG/L	BF	1A,6G
		Zinc	5.40	20.00	UG/L	F	6G
MAFB-465-NF	2/28/2013	Chromium	0.80	5.00	UG/L	F	6G
		Vanadium	3.30	5.00	UG/L	F	6G
MBS PTE SW-0401-NF	4/4/2013	Chromium	3.80	5.00	UG/L	BF	1A,6G
		Lead	1.40	5.00	UG/L	F	6G
		Zinc	5.00	20.00	UG/L	F	6G
MBS PTI-0401-NF	4/4/2013	Chromium	3.80	5.00	UG/L	BF	1A,6G
		Manganese	0.41	5.00	UG/L	BF	1A,6G
7-PTE-0401-NF	4/4/2013	Iron	23.00	100.00	UG/L	BF	1A,6G
		Manganese	0.30	5.00	UG/L	BF	1A,6G
		Zinc	21.00	20.00	UG/L	J	3D
7-PTI-0401-NF	4/4/2013	Manganese	0.32	5.00	UG/L	BF	1A,6G
		Zinc	10.00	20.00	UG/L	F	6G
ACW PTE-0401-NF	4/4/2013	Manganese	1.70	5.00	UG/L	BF	1A,6G
		Zinc	8.50	20.00	UG/L	F	6G
ACW PTI-0401-NF	4/4/2013	Zinc	9.30	20.00	UG/L	F	6G
7-BV-13-NF	6/3/2013	Antimony	2.70	10.00	UG/L	F	6G
		Chromium	0.81	5.00	UG/L	F	6G
		Lead	1.20	5.00	UG/L	BF	1F,6G
		Manganese	1.80	5.00	UG/L	F	6G
		Nickel	1.50	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	2.70	20.00	UG/L	F	6G
MAFB-413-NF	6/3/2013	Chromium	3.80	5.00	UG/L	F	6G
		Lead	1.20	5.00	UG/L	BF	1F,6G
		Manganese	1.10	5.00	UG/L	F	6G
		Nickel	1.90	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	6.90	20.00	UG/L	F	6G
7-PZ-38P-NF	6/4/2013	Lead	1.10	5.00	UG/L	BF	1F,6G,3D
		Nickel	5.10	5.00	UG/L	J	3D
		Silver	0.00	5.00	UG/L	UJ	2E-
		Vanadium	2.90	5.00	UG/L	F	6G
		Zinc	17.00	20.00	UG/L	FJ	6G,3D
MAFB-132-NF	6/5/2013	Lead	1.30	5.00	UG/L	BF	1F,6G
		Silver	0.66	5.00	UG/L	FJ	6G,2E-
		Vanadium	2.20	5.00	UG/L	F	6G
		Zinc	7.00	20.00	UG/L	F	6G
MAFB-136-NF	6/5/2013	Cobalt	0.68	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Vanadium	2.10	5.00	UG/L	F	6G
MAFB-133-NF	6/5/2013	Chromium	2.00	5.00	UG/L	F	6G
		Lead	1.10	5.00	UG/L	BF	1F,6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
		Manganese	0.75	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	2.70	20.00	UG/L	F	6G
MAFB-398-NF	6/5/2013	Chromium	0.74	5.00	UG/L	F	6G
		Lead	0.92	5.00	UG/L	BF	1F,6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	5.50	20.00	UG/L	F	6G
MAFB-398C-NF	6/6/2013	Chromium	2.20	5.00	UG/L	F	6G
		Lead	1.50	5.00	UG/L	BF	1F,6G
		Manganese	0.74	5.00	UG/L	F	6G
		Nickel	1.40	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	7.20	20.00	UG/L	F	6G
MAFB-399-NF	6/6/2013	Chromium	1.90	5.00	UG/L	F	6G
		Lead	1.00	5.00	UG/L	BF	1F,6G
		Manganese	0.60	5.00	UG/L	F	6G
		Nickel	1.20	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	5.70	20.00	UG/L	F	6G
MAFB-439-NF	6/6/2013	Lead	0.90	5.00	UG/L	BF	1F,6G
MAFB-149-NF	6/10/2013	Cadmium	1.20	5.00	UG/L	F	6G
		Chromium	3.80	5.00	UG/L	F	6G
		Lead	3.20	5.00	UG/L	BF	1A,6G
		Manganese	0.96	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	4.60	20.00	UG/L	F	6G
MAFB-400-NF	6/10/2013	Cadmium	1.30	5.00	UG/L	F	6G
		Chromium	0.66	5.00	UG/L	F	6G
		Copper	2.20	5.00	UG/L	F	6G
		Lead	4.90	5.00	UG/L	BF	1A,6G
		Manganese	1.40	5.00	UG/L	F	6G
		Nickel	2.70	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Vanadium	3.30	5.00	UG/L	F	6G
		Zinc	4.80	20.00	UG/L	F	6G
MAFB-288-NF	6/13/2013	Cadmium	1.10	5.00	UG/L	F	6G
		Chromium	1.80	5.00	UG/L	F	6G
		Manganese	0.42	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	3.50	20.00	UG/L	F	6G
7-EW-1-NF	6/13/2013	Copper	1.90	5.00	UG/L	F	6G
		Manganese	0.24	5.00	UG/L	F	6G
		Zinc	10.00	20.00	UG/L	F	6G
7-EW-2-NF	6/13/2013	Copper	1.40	5.00	UG/L	F	6G
		Zinc	8.60	20.00	UG/L	F	6G
7-PZ-37P-NF	6/18/2013	Cadmium	0.36	5.00	UG/L	F	6G
		Chromium	1.40	5.00	UG/L	F	6G
		Cobalt	0.42	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Vanadium	3.50	5.00	UG/L	F	6G
		Zinc	1.50	20.00	UG/L	F	6G
MAFB-284-NF	6/18/2013	Silver	0.00	5.00	UG/L	UJ	2E-
MAFB-465-NF	6/21/2013	Copper	1.60	5.00	UG/L	F	6G
		Manganese	4.60	5.00	UG/L	F	6G
		Nickel	2.80	5.00	UG/L	F	6G
		Selenium	2.40	10.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Vanadium	3.40	5.00	UG/L	F	6G
		Zinc	3.10	20.00	UG/L	F	6G
MBS PTE SW-0702-NF	7/10/2013	Chromium	3.30	5.00	UG/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
		Manganese	0.26	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	2.40	20.00	UG/L	F	6G
MBS PTI-0702-NF	7/10/2013	Chromium	3.50	5.00	UG/L	F	6G
		Copper	1.20	5.00	UG/L	F	6G
		Manganese	0.38	5.00	UG/L	F	6G
		Nickel	0.94	5.00	UG/L	F	6G
		Silver	0.00	5.00	UG/L	UJ	2E-
		Zinc	20.00	20.00	UG/L	F	6G
MBS PTE SW-1001-NF	10/2/2013	Antimony	3.90	10.00	UG/L	F	6G
		Chromium	3.60	5.00	UG/L	F	6G
		Zinc	7.60	20.00	UG/L	F	6G
MBS PTI-1001-NF	10/2/2013	Antimony	3.80	10.00	UG/L	F	6G
		Chromium	3.70	5.00	UG/L	F	6G
		Zinc	13.00	20.00	UG/L	F	6G
7-PTE-1001-NF	10/2/2013	Zinc	3.50	20.00	UG/L	F	6G
7-PTI-1001-NF	10/2/2013	Zinc	7.40	20.00	UG/L	F	6G
ACW PTE-1001-NF	10/2/2013	Iron	45.00	100.00	UG/L	F	6G
		Zinc	9.80	20.00	UG/L	F	6G
ACW PTI-1001-NF	10/2/2013	Zinc	11.00	20.00	UG/L	F	6G
MAFB-132-NF	11/18/2013	Molybdenum	2.60	5.00	UG/L	F	6G
		Nickel	170.00	5.00	UG/L	J	6A
		Vanadium	2.60	5.00	UG/L	F	6G
MAFB-400-NF	11/19/2013	Nickel	6.30	5.00	UG/L	J	6A
Method SW6020							
MBS PTE SW-0102-NS	1/9/2013	Selenium	0.60	1.00	UG/L	F	6G
MBS PTI-0102-NS	1/9/2013	Lead	0.42	1.00	UG/L	F	6G
		Selenium	0.49	1.00	UG/L	F	6G
MC-R1-0102-NS	1/9/2013	Lead	0.50	1.00	UG/L	F	6G
MBS PTE SW-0401-NS	4/4/2013	Lead	0.49	1.00	UG/L	MF	2B+,3B,6G
		Selenium	0.30	1.00	UG/L	F	6G
MC-R1-0401-NS	4/4/2013	Selenium	0.31	1.00	UG/L	F	6G
MC-R2-0401-NS	4/4/2013	Lead	0.80	1.00	UG/L	F	6G
MBS PTE SW-0702-NS	7/10/2013	Lead	0.27	1.00	UG/L	F	6G
		Selenium	0.58	1.00	UG/L	BF	1A,6G
MC-R1-0702-NF	7/10/2013	Lead	0.15	1.00	UG/L	F	6G
MC-R1-0702-NS	7/10/2013	Lead	0.16	1.00	UG/L	F	6G
		Selenium	0.41	1.00	UG/L	BF	1A,6G
MC-R2-0702-NF	7/10/2013	Lead	0.80	1.00	UG/L	F	6G
MC-R2-0702-NS	7/10/2013	Selenium	0.41	1.00	UG/L	BF	1A,6G
ACW PTE-0702-NF	7/10/2013	Iron	33.00	71.00	UG/L	F	6G
MAFB-465-NF	9/11/2013	Barium	85.00	1.00	UG/L	J	6A
		Chromium	0.62	1.00	UG/L	F	6G
		Cobalt	0.07	1.00	UG/L	F	6G
		Nickel	1.60	3.00	UG/L	F	6G
		Selenium	0.45	1.00	UG/L	F	6G
		Copper	0.65	1.00	UG/L	BF	1A,6G
		Zinc	5.40	16.00	UG/L	F	6G
MBS PTE SW-1001-NF	10/2/2013	Thallium	0.20	1.00	UG/L	F	6G
MBS PTE SW-1001-NS	10/2/2013	Lead	0.16	1.00	UG/L	F	6G
		Selenium	0.43	1.00	UG/L	BF	1F,6G
MC-R1-1001-NF	10/2/2013	Lead	0.25	1.00	UG/L	F	6G
MC-R1-1001-NS	10/2/2013	Selenium	0.23	1.00	UG/L	BF	1F,6G
MC-R2-1001-NF	10/2/2013	Lead	0.13	1.00	UG/L	F	6G
MC-R2-1001-NS	10/2/2013	Lead	0.17	1.00	UG/L	F	6G
		Selenium	0.24	1.00	UG/L	F	6G
Method SW7470A							
MAFB-413-NF	6/3/2013	Mercury	0.07	0.20	UG/L	F	6G
7-PZ-38P-NF	6/4/2013	Mercury	0.05	0.20	UG/L	F	6G
MAFB-133-NF	6/5/2013	Mercury	0.08	0.20	UG/L	BF	1A,6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MAFB-398-NF	6/5/2013	Mercury	0.09	0.20	UG/L	BF	1A,6G
MAFB-398C-NF	6/6/2013	Mercury	0.08	0.20	UG/L	BF	1A,6G
7-PZ-37P-NF	6/18/2013	Mercury	0.05	0.20	UG/L	F	6G
MAFB-284-NF	6/18/2013	Mercury	0.06	0.20	UG/L	F	6G
Method SW8081A							
7-PZ-37P-NS	6/18/2013	4,4'-DDD	0.00	0.10	UG/L	UJ	5B-
		Endrin	0.00	0.10	UG/L	UJ	5A-
		Methoxychlor	0.00	0.50	UG/L	UJ	5B-
MAFB-284-NS	6/18/2013	4,4'-DDD	0.00	0.10	UG/L	UJ	5B-
		Endrin	0.00	0.10	UG/L	UJ	5A-
		Methoxychlor	0.00	0.50	UG/L	UJ	5B-
Method SW8260B							
MBS PTI-0102-NS	1/9/2013	Chloroform	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MC-R2-0102-NS	1/9/2013	Chloromethane	0.1	0.5	UG/L	F	6G
7-PTI-0102-NS	1/9/2013	1,1-Dichloroethane	0.4	1.0	UG/L	F	6G
		1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		1,2-Dichloroethane	0.5	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.3	1.0	UG/L	F	6G
MAFB-181-NS	2/26/2013	Chloroform	0.1	0.5	UG/L	F	6G
MAFB-460Bd-NS	2/27/2013	Trichloroethene	0.6	0.5	UG/L	J	2C+
MAFB-460Bs-NS	2/27/2013	Tetrachloroethene	0.1	0.5	UG/L	FJ	2C+,6G
		Trichloroethene	1.4	0.5	UG/L	J	2C+
MAFB-461Bs-NS	2/27/2013	Trichloroethene	0.2	0.5	UG/L	F	6G
MAFB-465-NS	2/28/2013	1,2-Dichloroethane	0.2	0.5	UG/L	F	6G
		Vinyl Chloride	0.2	0.5	UG/L	F	6G
OFB-72-NS	2/27/2013	Trichloroethene	0.7	0.5	UG/L	J	2C+
MBS PTI-0401-NS	4/4/2013	Chloroform	0.2	0.5	UG/L	BF	1B,6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MC-R2-0401-NS	4/4/2013	Toluene	0.1	1.0	UG/L	F	6G
7-PTI-0401-NS	4/4/2013	1,1-Dichloroethane	0.4	1.0	UG/L	F	6G
		1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.2	1.0	UG/L	F	6G
MAFB-053-NS	5/28/2013	Trichloroethene	0.4	0.5	UG/L	F	6G
MAFB-402-NS	5/29/2013	1,2-Dichloroethane	0.1	0.5	UG/L	F	6G
MAFB-436-NS	5/30/2013	Chloromethane	0.3	0.5	UG/L	FJ	6G,5B+
MAFB-207-NS	5/31/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-048-NS	5/31/2013	Trichloroethene	0.2	0.5	UG/L	F	6G
MAFB-414-NS	5/31/2013	Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-205-NS	5/31/2013	1,2-Dichloroethane	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.5	0.5	UG/L	F	6G
7-BV-13-NS	6/3/2013	Tetrachloroethene	0.4	0.5	UG/L	F	6G
MAFB-033-NS	6/3/2013	1,2-Dichloroethane	0.4	0.5	UG/L	F	6G
		Tetrachloroethene	0.3	0.5	UG/L	F	6G
7-BV-02-NS	6/4/2013	Vinyl Chloride	0.5	0.5	UG/L	F	6G
MAFB-339-NS	6/4/2013	Chloroform	0.1	0.5	UG/L	F	6G
		Tetrachloroethene	0.4	0.5	UG/L	F	6G
MAFB-357Dd-NS	6/4/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
MAFB-357Ds-NS	6/4/2013	Carbon Tetrachloride	0.3	0.5	UG/L	FJ	6G,2A+,5B+
		Chloroform	0.1	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-404-NS	6/4/2013	Chloroform	0.1	0.5	UG/L	FJ	6G,2C+
		Chloromethane	0.2	0.5	UG/L	FJ	6G,2C+
		Trichloroethene	0.7	0.5	UG/L	J	2C+
MAFB-132-NS	6/5/2013	1,2-Dichloroethane	0.2	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.1	1.0	UG/L	F	6G
MAFB-136-NS	6/5/2013	Trichloroethene	0.4	0.5	UG/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MAFB-384B-NS	6/5/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.5	0.5	UG/L	J	2C+
		Trichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-358D-NS	6/5/2013	Tetrachloroethene	4.0	0.5	UG/L	J	2C+
MAFB-407-NS	6/5/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-407-NS	6/5/2013	Tetrachloroethene	0.4	0.5	UG/L	FJ	6G,2C+
MAFB-438-NS	6/5/2013	Tetrachloroethene	4.5	0.5	UG/L	J	2C+
		Trichloroethene	0.5	0.5	UG/L	FJ	6G,2C+
		cis-1,2-Dichloroethene	1.0	0.5	UG/L	J	2C+
MAFB-231-NS	6/5/2013	Chloroform	0.1	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	4.9	0.5	UG/L	J	2C+
		Trichloroethene	0.4	0.5	UG/L	FJ	6G,2C+
MAFB-250-NS	6/5/2013	1,2-Dichloroethane	0.1	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
		Carbon Tetrachloride	0.3	0.5	UG/L	F	6G
		Tetrachloroethene	0.4	0.5	UG/L	F	6G
MAFB-274-NS	6/5/2013	Chloroform	0.2	0.5	UG/L	F	6G
MBS PZ-52-NS	6/5/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.1	0.5	UG/L	F	6G
7-PTE-0601-NS	6/5/2013	Bromomethane	0.0	10.0	UG/L	UJ	5A-
MBS PTE SW-0601-NS	6/5/2013	Bromomethane	0.0	10.0	UG/L	UJ	5A-
MAFB-101-NS	6/6/2013	Carbon Tetrachloride	0.4	0.5	UG/L	FJ	6G,2C+,5B+
		Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	3.1	0.5	UG/L	J	2C+
MAFB-102-NS	6/7/2013	Chloroform	0.4	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MAFB-201-NS	6/7/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.4	0.5	UG/L	F	6G
MAFB-203-NS	6/7/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-203-NS	6/7/2013	cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-214-NS	6/6/2013	Tetrachloroethene	0.1	0.5	UG/L	F	6G
		Trichloroethene	0.1	0.5	UG/L	F	6G
MAFB-222-NS	6/6/2013	Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-223-NS	6/7/2013	1,1-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-224-NS	6/7/2013	1,1-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-227-NS	6/7/2013	1,1-Dichloroethene	0.5	0.5	UG/L	F	6G
MAFB-228-NS	6/6/2013	Carbon Tetrachloride	0.5	0.5	UG/L	FJ	6G,2C+
		Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	6.2	0.5	UG/L	J	2C+
MAFB-235-NS	6/7/2013	Carbon Tetrachloride	0.3	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	1.2	0.5	UG/L	J	2C+
		Trichloroethene	0.8	0.5	UG/L	J	2C+
MAFB-242-NS	6/6/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		Chloroform	0.4	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.5	0.5	UG/L	F	6G
MAFB-246-NS	6/7/2013	Carbon Tetrachloride	1.1	0.5	UG/L	J	2C+
		Trichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-264-NS	6/7/2013	Chloroform	0.4	0.5	UG/L	F	6G
MAFB-320-NS	6/6/2013	Carbon Tetrachloride	1.5	0.5	UG/L	J	2C+
		Tetrachloroethene	13.0	0.5	UG/L	J	2C+
MAFB-340-NS	6/6/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.4	0.5	UG/L	FJ	6G,2C+
		Trichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-398-NS	6/5/2013	Tetrachloroethene	3.1	0.5	UG/L	J	2C+
		Trichloroethene	0.5	0.5	UG/L	J	2C+
		cis-1,2-Dichloroethene	0.4	0.5	UG/L	FJ	6G,2C+
MAFB-398C-NS	6/6/2013	1,2-Dichloroethane	0.2	0.5	UG/L	FJ	6G,3D
		1,2-Dichloropropane	1.0	1.0	UG/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MAFB-410-NS	6/6/2013	Carbon Tetrachloride	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.3	0.5	UG/L	FJ	6G,2C+
MAFB-428-NS	6/6/2013	Tetrachloroethene	0.1	0.5	UG/L	F	6G
MBS 19MW01-NS	6/7/2013	Tetrachloroethene	1.4	0.5	UG/L	J	2C+
MBS 39MW03-NS	6/6/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-216-NS	6/7/2013	Trichloroethene	0.4	0.5	UG/L	F	6G
MAFB-359-NS	6/7/2013	Tetrachloroethene	0.3	0.5	UG/L	F	6G
FFS MW15-6-NS	6/10/2013	Chloroform	0.4	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MBS PZ-44-NS	6/10/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
MAFB-249-NS	6/11/2013	Carbon Tetrachloride	0.5	0.5	UG/L	F	6G
		Chloroform	0.5	0.5	UG/L	F	6G
MAFB-422-NS	6/11/2013	cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MAFB-423B-NS	6/11/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
MAFB-172-NS	6/11/2013	Trichloroethene	0.3	0.5	UG/L	F	6G
MAFB-229-NS	6/11/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-247-NS	6/11/2013	Chloroform	0.3	0.5	UG/L	FJ	6G,3D
MAFB-258-NS	6/11/2013	cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-265-NS	6/11/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-282-NS	6/11/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
		Chloroform	0.3	0.5	UG/L	F	6G
MAFB-282-NS	6/11/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
MAFB-451-NS	6/11/2013	1,1-Dichloroethene	0.4	0.5	UG/L	F	6G
		Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Chloroform	0.1	0.5	UG/L	F	6G
MAFB-452B-NS	6/11/2013	Carbon Tetrachloride	0.3	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
MAFB-059-NS	6/12/2013	Trichloroethene	0.3	0.5	UG/L	FJ	6G,2C+
MAFB-170-NS	6/12/2013	Tetrachloroethene	0.2	0.5	UG/L	FJ	6G,2C+
		Trichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-218-NS	6/12/2013	Chloroform	0.4	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-429Bd-NS	6/12/2013	1,1-Dichloroethene	0.5	0.5	UG/L	F	6G
		Tetrachloroethene	3.3	0.5	UG/L	J	3D
MAFB-429Bs-NS	6/12/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-431Bd-NS	6/12/2013	cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MAFB-434Bd-NS	6/12/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
MAFB-288-NS	6/13/2013	Trichloroethene	0.1	0.5	UG/L	F	6G
MAFB-425-NS	6/13/2013	cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-056-NS	6/13/2013	Trichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-449Bs-NS	6/13/2013	Tetrachloroethene	0.3	0.5	UG/L	F	6G
MAFB-457Bs-NS	6/13/2013	cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MAFB-458Bd-NS	6/13/2013	Tetrachloroethene	0.2	0.5	UG/L	FJ	6G,3D
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-458Bs-NS	6/13/2013	cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-461Bs-NS	6/13/2013	Trichloroethene	0.2	0.5	UG/L	F	6G
MBS EW-13BuB-NS	6/13/2013	1,1-Dichloroethene	0.3	0.5	UG/L	M	6G,2B-
		1,2-Dichloropropane	0.0	1.0	UG/L	M	2B-
		Trichloroethene	8.1	0.5	UG/L	M	2B-
		cis-1,2-Dichloroethene	0.5	0.5	UG/L	F	6G
7-EW-1-NS	6/13/2013	cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
7-EW-2-NS	6/13/2013	1,2-Dichloropropane	0.4	1.0	UG/L	F	6G
7-PZ-37P-NS	6/18/2013	1,1-Dichloroethane	0.4	1.0	UG/L	FJ	6G,2C+
		1,1-Dichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	3.8	0.5	UG/L	J	2C+
		Trichloroethene	4.6	0.5	UG/L	J	2C+
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-284-NS	6/18/2013	1,2-Dichloroethane	0.6	0.5	UG/L	J	2C+

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
		1,2-Dichloropropane	0.8	1.0	UG/L	FJ	6G,2C+
		Tetrachloroethene	1.2	0.5	UG/L	J	2C+
		Trichloroethene	6.8	0.5	UG/L	J	2C+
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-381B-NS	6/19/2013	Chloroform	0.4	0.5	UG/L	FJ	6G,3D
MAFB-381D-NS	6/19/2013	Carbon Tetrachloride	0.1	0.5	UG/L	FJ	6G,2C+
MAFB-393-NS	6/17/2013	1,1-Dichloroethane	0.2	1.0	UG/L	F	6G
		1,2-Dichloroethane	0.4	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.2	1.0	UG/L	F	6G
		Bromomethane	0.0	10.0	UG/L	UJ	5B-
MAFB-394-NS	6/17/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-395-NS	6/17/2013	Tetrachloroethene	0.5	0.5	UG/L	FJ	6G,2C+
MAFB-395-NS	6/17/2013	Trichloroethene	1.9	0.5	UG/L	J	2C+
MAFB-396-NS	6/17/2013	Tetrachloroethene	0.4	0.5	UG/L	FJ	6G,2C+
		Trichloroethene	1.6	0.5	UG/L	J	2C+
MAFB-430-NS	6/19/2013	Carbon Tetrachloride	0.5	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	2.8	0.5	UG/L	J	2C+
MAFB-444-NS	6/17/2013	Tetrachloroethene	0.3	0.5	UG/L	FJ	6G,2C+
		Trichloroethene	1.3	0.5	UG/L	J	2C+
MAFB-446-NS	6/17/2013	1,2-Dichloroethane	0.3	0.5	UG/L	F	6G
MAFB-447-NS	6/17/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-464-NS	6/17/2013	Trichloroethene	0.3	0.5	UG/L	F	6G
MBS PZ-51-NS	6/19/2013	Chloroform	0.4	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MBS PZ-54-NS	6/19/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
OFB-07-NS	6/17/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
OFB-12-NS	6/17/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
OFB-24-NS	6/17/2013	Chloroform	0.3	0.5	UG/L	FJ	6G,3D
		Tetrachloroethene	0.1	0.5	UG/L	F	6G
OFB-72-NS	6/17/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
OFB-83-NS	6/19/2013	1,1-Dichloroethene	0.0	0.5	UG/L	UJ	4D-
		1,2-Dichloroethane	0.0	0.5	UG/L	UJ	4D-
		1,2-Dichloropropane	0.0	1.0	UG/L	UJ	4D-
		1,4-Dichlorobenzene	0.0	0.5	UG/L	UJ	4D-
		Carbon Tetrachloride	0.0	0.5	UG/L	UJ	4D-
		Chloroform	0.0	0.5	UG/L	UJ	4D-
		Chloromethane	0.0	0.5	UG/L	UJ	4D-
		Tetrachloroethene	0.0	0.5	UG/L	UJ	4D-
		Trichloroethene	0.0	0.5	UG/L	UJ	4D-
		Vinyl Chloride	0.0	0.5	UG/L	UJ	4D-
		cis-1,2-Dichloroethene	0.0	0.5	UG/L	UJ	4D-
MAFB-176-NS	6/21/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
MAFB-261-NS	6/21/2013	Carbon Tetrachloride	0.3	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
		Chloromethane	0.3	0.5	UG/L	F	6G
MAFB-368B-NS	6/21/2013	Chloroform	0.1	0.5	UG/L	F	6G
MAFB-368D-NS	6/21/2013	Carbon Tetrachloride	0.3	0.5	UG/L	F	6G
		Chloroform	0.1	0.5	UG/L	F	6G
MAFB-426-NS	6/20/2013	Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
MAFB-437Dd-NS	6/19/2013	Chloromethane	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-437Ds-NS	6/19/2013	Carbon Tetrachloride	0.2	0.5	UG/L	FJ	6G,2C+
		Chloroform	0.4	0.5	UG/L	FJ	6G,2C+
		Chloromethane	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.7	0.5	UG/L	J	2C+
MAFB-463D-NS	6/21/2013	Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Trichloroethene	0.4	0.5	UG/L	F	6G
MAFB-463Dd-NS	6/21/2013	Chloromethane	0.3	0.5	UG/L	FJ	6G,2C+
MBS PZ-53-NS	6/21/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,2C+

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MAFB-177-NS	6/24/2013	Carbon Tetrachloride	0.5	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
MAFB-268-NS	6/24/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-268-NS	6/24/2013	cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MAFB-318-NS	6/24/2013	Chloroform	0.3	0.5	UG/L	F	6G
MAFB-167-NS	6/25/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Chloromethane	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-240-NS	6/25/2013	Chloroform	0.3	0.5	UG/L	F	6G
MAFB-361-NS	6/25/2013	Tetrachloroethene	0.6	0.5	UG/L	J	2C+
		Trichloroethene	0.4	0.5	UG/L	FJ	6G,2C+
MAFB-379D-NS	6/25/2013	Carbon Tetrachloride	0.3	0.5	UG/L	FJ	6G,5B+,2C+
		Tetrachloroethene	2.0	0.5	UG/L	J	2C+
MAFB-380B-NS	6/25/2013	Chloroform	0.4	0.5	UG/L	FJ	6G,2C+
		Chloromethane	0.3	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.3	0.5	UG/L	FJ	6G,2C+
MAFB-435-NS	6/25/2013	Carbon Tetrachloride	1.3	0.5	UG/L	J	2C+
		Tetrachloroethene	6.7	0.5	UG/L	J	2C+
MBS PZ-42D-NS	6/25/2013	Carbon Tetrachloride	0.1	0.5	UG/L	F	6G
		Chloroform	0.4	0.5	UG/L	F	6G
MBS PZ-55B-NS	6/25/2013	Carbon Tetrachloride	1.1	0.5	UG/L	J	2C+
		Chloroform	0.3	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	3.4	0.5	UG/L	J	2C+
		Trichloroethene	5.7	0.5	UG/L	J	2C+
MBS PZ-55Bu-NS	6/25/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
MAFB-269-NS	6/26/2013	Tetrachloroethene	0.2	0.5	UG/L	FJ	6G,5B+
MAFB-365B-NS	6/26/2013	Chloroform	0.3	0.5	UG/L	FJ	6G,3D
		Trichloroethene	0.3	0.5	UG/L	F	6G
MAFB-365D-NS	6/26/2013	Chloromethane	0.1	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.1	0.5	UG/L	FJ	6G,2C+
MAFB-291-NS	6/26/2013	Chloromethane	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-375-NS	6/26/2013	Chloromethane	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	0.2	0.5	UG/L	FJ	6G,2C+
MAFB-376-NS	6/26/2013	1,1-Dichloroethene	0.0	0.5	UG/L	UJ	4D-
		1,2-Dichloroethane	0.0	0.5	UG/L	UJ	4D-
		1,2-Dichloropropane	0.0	1.0	UG/L	M	4D-,2B-
		1,4-Dichlorobenzene	0.0	0.5	UG/L	M	4D-,2B-
		Carbon Tetrachloride	0.2	0.5	UG/L	M	4D-,6G,3B
		Chloroform	0.0	0.5	UG/L	UJ	4D-
		Chloromethane	0.0	0.5	UG/L	UJ	4D-
		Trichloroethene	0.0	0.5	UG/L	M	4D-,2B-
		Vinyl Chloride	0.0	0.5	UG/L	UJ	4D-
		cis-1,2-Dichloroethene	0.0	0.5	UG/L	UJ	4D-
		Tetrachloroethene	2.8	0.5	UG/L	M	4D-,2B-
MBS PZ-42S-NS	6/26/2013	Chloroform	0.3	0.5	UG/L	FJ	6G,3D
MAFB-405-NS	6/27/2013	Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Chloroform	0.4	0.5	UG/L	F	6G
MAFB-417-NS	6/27/2013	1,2-Dichloropropane	0.3	1.0	UG/L	F	6G
MAFB-432-NS	6/27/2013	Trichloroethene	4.4	0.5	UG/L	J	2C+
MAFB-454-NS	6/27/2013	Trichloroethene	1.6	0.5	UG/L	J	2C+
ACW AT-1-NS	6/28/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
		Trichloroethene	23.0	0.5	UG/L	J	2C+
ACW AT-2-NS	6/28/2013	Trichloroethene	19.0	0.5	UG/L	J	2C+
ACW EW-1-NS	6/28/2013	Trichloroethene	13.0	0.5	UG/L	J	2C+
ACW EW-2-NS	6/28/2013	Trichloroethene	2.1	0.5	UG/L	J	2C+
ACW EW-3-NS	6/28/2013	Trichloroethene	1.7	0.5	UG/L	J	2C+
MBS 39ABuB-NS	6/28/2013	Chloroform	0.1	0.5	UG/L	F	6G
MBS EW-4D-NS	6/28/2013	Carbon Tetrachloride	0.3	0.5	UG/L	F	6G
		Chloroform	0.1	0.5	UG/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MBS EW-5D-NS	6/28/2013	Carbon Tetrachloride	0.5	0.5	UG/L	M	2B+
		Chloroform	0.1	0.5	UG/L	F	6G
MBS EW7ABu-NS	6/28/2013	Chloroform	0.1	0.5	UG/L	F	6G
		Trichloroethene	0.2	0.5	UG/L	F	6G
MBS EW-12AB-NS	6/28/2013	Chloroform	0.1	0.5	UG/L	F	6G
MAFB-180-NS	6/27/2013	Chloroform	0.5	0.5	UG/L	F	6G
MAFB-290-NS	6/27/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Tetrachloroethene	0.1	0.5	UG/L	F	6G
MAFB-296-NS	6/27/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-346Bd-NS	6/27/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Tetrachloroethene	0.4	0.5	UG/L	F	6G
		Trichloroethene	0.3	0.5	UG/L	F	6G
MAFB-346Bs-NS	6/27/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-314-NS	7/1/2013	Carbon Tetrachloride	0.2	0.5	UG/L	FJ	6G,2C+
		Chloroform	0.2	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	32.0	0.5	UG/L	J	2C+
		Trichloroethene	0.3	0.5	UG/L	FJ	6G,2C+
MBS EW-1D-NS	7/1/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.3	0.5	UG/L	F	6G
MBS EW-3D-NS	7/1/2013	Carbon Tetrachloride	1.5	0.5	UG/L	J	2C+
		Chloroform	0.3	0.5	UG/L	FJ	6G,2C+
		Tetrachloroethene	56.0	0.5	UG/L	J	2C+
		Trichloroethene	1.8	0.5	UG/L	J	2C+
MBS EW-4Bu-NS	7/1/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
MBS EW-9B-NS	7/1/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
MBS 19EW01-NS	7/1/2013	Chloroform	0.4	0.5	UG/L	F	6G
MAFB-063-NS	7/2/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
		Chloroform	0.3	0.5	UG/L	F	6G
MAFB-104-NS	7/2/2013	Chloroform	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-164-NS	7/2/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
		Chloroform	0.4	0.5	UG/L	F	6G
MAFB-243-NS	7/2/2013	Chloroform	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-371C-NS	7/2/2013	Tetrachloroethene	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-372B-NS	7/2/2013	cis-1,2-Dichloroethene	0.3	0.5	UG/L	F	6G
MBS EW2ABu-NS	7/2/2013	Chloroform	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MBS EW-2D-NS	7/2/2013	Chloroform	0.3	0.5	UG/L	F	6G
MBS EW-7B-NS	7/2/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.2	0.5	UG/L	F	6G
MBS PZ-39-NS	7/2/2013	Carbon Tetrachloride	0.1	0.5	UG/L	F	6G
		Chloroform	0.5	0.5	UG/L	F	6G
MAFB-181-NS	7/3/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-220-NS	7/3/2013	1,1-Dichloroethene	0.6	0.5	UG/L	M	3B
		1,2-Dichloroethane	0.1	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MAFB-312-NS	7/3/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-382B-NS	7/3/2013	Trichloroethene	0.1	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MBS EW-5B-NS	7/3/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
		Chloroform	0.4	0.5	UG/L	F	6G
MAFB-168-NS	7/5/2013	1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
MAFB-230-NS	7/5/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-364B-NS	7/5/2013	Carbon Tetrachloride	0.1	0.5	UG/L	F	6G
		Chloroform	0.3	0.5	UG/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MAFB-364D-NS	7/5/2013	Trichloroethene	0.1	0.5	UG/L	F	6G
MBS EW1ABu-NS	7/5/2013	Carbon Tetrachloride	0.1	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	F	6G
MBS EW-3B-NS	7/5/2013	Chloroform	0.2	0.5	UG/L	F	6G
MBS PZ-50S-NS	7/5/2013	Trichloroethene	0.2	0.5	UG/L	F	6G
MAFB-215-NS	7/8/2013	Carbon Tetrachloride	0.5	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-217-NS	7/8/2013	1,1-Dichloroethene	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-248-NS	7/8/2013	Chloroform	0.4	0.5	UG/L	F	6G
		Tetrachloroethene	0.1	0.5	UG/L	F	6G
MAFB-266-NS	7/8/2013	Chloroform	0.3	0.5	UG/L	F	6G
MAFB-362-NS	7/8/2013	Trichloroethene	0.3	0.5	UG/L	F	6G
MAFB-420-NS	7/8/2013	Chloroform	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MBS EW-1B-NS	7/8/2013	Chloroform	0.5	0.5	UG/L	F	6G
MBS EW-1Bu-NS	7/8/2013	Tetrachloroethene	0.4	0.5	UG/L	F	6G
MBS EW-2AR-NS	7/8/2013	1,1-Dichloroethene	0.5	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.4	0.5	UG/L	F	6G
MBS EW-2B-NS	7/8/2013	Carbon Tetrachloride	0.2	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
MBS EW-4B-NS	7/8/2013	Carbon Tetrachloride	0.1	0.5	UG/L	F	6G
		Chloroform	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.2	0.5	UG/L	F	6G
MBS PTI-0702-NS	7/10/2013	Chloroform	0.2	0.5	UG/L	FJ	6G,3D
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	FJ	6G,3D
MC-R1-0702-NS	7/10/2013	Chloroform	0.2	0.5	UG/L	F	6G
7-PTI-0702-NS	7/10/2013	1,1-Dichloroethane	0.4	1.0	UG/L	F	6G
		1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.2	1.0	UG/L	F	6G
MAFB-173-NS	7/9/2013	Chloroform	0.2	0.5	UG/L	F	6G
MBS EW6ABu-NS	7/9/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.4	0.5	UG/L	F	6G
MBS EW-6B-NS	7/9/2013	Trichloroethene	0.2	0.5	UG/L	F	6G
MBS EW-8B-NS	7/9/2013	Chloroform	0.5	0.5	UG/L	F	6G
MBS EW-10B-NS	7/9/2013	Chloroform	0.3	0.5	UG/L	F	6G
		Trichloroethene	0.4	0.5	UG/L	F	6G
MBS EW-11B-NS	7/9/2013	Chloroform	0.2	0.5	UG/L	F	6G
MBS EW-12B-NS	7/9/2013	Carbon Tetrachloride	0.4	0.5	UG/L	F	6G
		Tetrachloroethene	0.2	0.5	UG/L	F	6G
MAFB-062-NS	7/10/2013	Chloroform	0.1	0.5	UG/L	F	6G
		Tetrachloroethene	0.5	0.5	UG/L	F	6G
		Trichloroethene	0.5	0.5	UG/L	F	6G
MAFB-366D-NS	7/10/2013	Tetrachloroethene	0.3	0.5	UG/L	F	6G
MAFB-377-NS	7/10/2013	Chloroform	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MAFB-042-NS	7/16/2013	Trichloroethene	0.3	0.5	UG/L	F	6G
MAFB-047-NS	7/11/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
		Trichloroethene	0.4	0.5	UG/L	F	6G
MAFB-175-NS	7/11/2013	Carbon Tetrachloride	0.3	0.5	UG/L	F	6G
		Chloroform	0.1	0.5	UG/L	F	6G
MBS PTE SW-0802-NS	8/7/2013	Bromomethane	0.0	10.0	UG/L	UJ	5A-
MAFB-181-NS	9/4/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-460Bs-NS	9/5/2013	Tetrachloroethene	0.3	0.5	UG/L	F	6G
MAFB-461Bs-NS	9/5/2013	Trichloroethene	0.2	0.5	UG/L	F	6G
MAFB-464-NS	9/5/2013	Trichloroethene	0.3	0.5	UG/L	F	6G
OFB-72-NS	9/5/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	F	6G
MBS PTI-1001-NS	10/2/2013	Chloroform	0.3	0.5	UG/L	F	6G

Sample Identication	Sample Date	Analyte	Result	Reporting Limit	Units	EPA Flag	Reason Code
MC-R1-1001-NS	10/2/2013	Toluene	0.2	1.0	UG/L	F	6G
7-PTI-1001-NS	10/2/2013	1,1-Dichloroethane	0.4	1.0	UG/L	F	6G
		1,1-Dichloroethene	0.2	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.2	1.0	UG/L	F	6G
ACW R2-1001-NS	10/2/2013	Chloroform	0.1	0.5	UG/L	BF	1A,6G
ACW EW-2-NS	11/18/2013	Trichloroethene	0.3	0.5	UG/L	FJ	6G,2C+
ACW EW-6R-NS	11/18/2013	Trichloroethene	8.7	0.5	UG/L	J	2C+
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	BF	1B,6G
MAFB-132-NS	11/18/2013	1,2-Dichloroethane	0.1	0.5	UG/L	F	6G
		1,2-Dichloropropane	0.1	1.0	UG/L	F	6G
		Chloroform	0.1	0.5	UG/L	BF	1A,6G
MAFB-196-NS	11/18/2013	Chloroform	0.1	0.5	UG/L	FJ	6G,2C+
MAFB-181-NS	11/19/2013	Chloroform	0.2	0.5	UG/L	F	6G
MAFB-341-NS	11/19/2013	Chloroform	0.2	0.5	UG/L	F	6G
		Tetrachloroethene	0.5	0.5	UG/L	F	6G
		Trichloroethene	0.3	0.5	UG/L	BF	1A,6G
MAFB-378B-NS	11/19/2013	Trichloroethene	0.2	0.5	UG/L	BF	1A,6G
MAFB-378D-NS	11/19/2013	Trichloroethene	0.1	0.5	UG/L	BF	1A,6G
MAFB-397-NS	11/19/2013	Trichloroethene	0.1	0.5	UG/L	BF	1A,6G
MAFB-460Bd-NS	11/19/2013	Tetrachloroethene	0.1	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.1	0.5	UG/L	BF	1B,6G
MAFB-460Bs-NS	11/19/2013	Tetrachloroethene	0.3	0.5	UG/L	F	6G
		cis-1,2-Dichloroethene	0.2	0.5	UG/L	BF	1B,6G
MAFB-461Bd-NS	11/19/2013	Trichloroethene	0.1	0.5	UG/L	BF	1A,6G
MAFB-461Bs-NS	11/19/2013	Trichloroethene	0.3	0.5	UG/L	FJ	1A,6G,3D
MAFB-464-NS	11/19/2013	Trichloroethene	0.3	0.5	UG/L	BF	1A,6G
OFB-72-NS	11/19/2013	Tetrachloroethene	0.2	0.5	UG/L	F	6G

EPA Flag
B = Result considered not detected due to blank contamination
F = Result is less than the reporting limit but greater than the detection limit
M = Result is qualified due to matrix interference
J = Analyte concentration considered an estimated value because one or more quality control specification were not met.
UJ = reporting limit considered an estimated value because one or more quality control specifications were not met.

Units
mg/L = milligrams per liter
ug/L = micrograms per liter

Qualification Code
1A, 1B, 1F = blank contamination
2B+, 2B- = matrix spike recovery did not meet criteria
2C+ = surrogate spike recovery did not meet criteria
2E- = analytical spike did not meet criteria
3A = laboratory control sample imprecision
3B = matrix spike imprecision
3C = laboratory duplicate imprecision
3D = field duplicate imprecision
4B = sample preservation requirements not met
4D = bubbles in sample container
5A- = second source calibration did not meet criteria
5B+,5B- = continuing calibration verfication recovery did not meet criteria
6A = serial dilution did not meet criteria
6F = sample pattern did not match standard pattern
6G = Result is less than the reporting limit but greater than the detection limit

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE